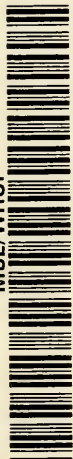


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VOLUME V

Botany of Porto Rico and the Virgin Islands

Pandanales to Thymeleales



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PREFACE.

By N. L. BRITTON.

Porto Rico and the Virgin Islands form a geographical, geological and biological province with many natural features in common from west to east, only Anegada, the most eastern island, diverging widely from the general type, through its recent soft limestones and the accompanying specialized plant and animal types.

The archipelago, with a total land area somewhat less than that of the State of Connecticut, lies within the geographical area from west longitude $67^{\circ} 56'$ (Mona) to west longitude $64^{\circ} 16'$ (Anegada) and within the narrow belt of north latitude $17^{\circ} 40'$ (St. Croix) to north latitude $18^{\circ} 33'$ (northern coast of Porto Rico) and $18^{\circ} 45'$ (Anegada). This narrow latitudinal belt renders the illumination of the whole area essentially uniform, as also the atmospheric movements of tradewinds and cyclones, and the temperatures of the waters enclosing the islands; the air temperatures at equal altitudes are also essentially alike.

The old land mountain axis of Porto Rico extends brokenly and reaching lower elevations eastward through the islands Culebra, Vieques, St. Thomas, St. Jan and Tortola to Virgin Gorda. Desecheo Island, in the Mona Passage, west of Porto Rico, is also in this old land axis.

The newer, Tertiary, land and rock-series of Porto Rico, represented by the northern and southern coastal plains and their accompanying hills, largely of limestone, are not represented, however, in the Virgin Islands from St. Thomas to Virgin Gorda, though occurring on Vieques, on Cayo Muertos, and on Mona.

St. Croix, which lies isolated well south of the main axis of the archipelago, is included in the Virgin Islands in a broad sense only, being geographically separated from the other islands, although with much in common with them biologically.

The elements of greatest natural diversity within the area are found (1) in the differing altitudes and accompanying differing

barometric phenomena; (2) in the differing rainfalls; (3) in the differing soils. All these profoundly influence the distribution of the native plants and animals and also agricultural and horticultural practices and possibilities.

1. **ALTITUDES.** On the mainland of Porto Rico the monadnocks of the Luquillo Mountains and of the Cordillera Central rise to elevations of about 1200 meters, much of the central part averaging about 600 meters. St. Thomas rises to about 450 meters; St. Jan is a little lower; Tortola reaches about 550 meters. Ascending anywhere from sea level, the observer can not fail to notice decreasing temperatures and changes in the vegetation; reaching about 600 meters, most of the lowland plants have been left behind, and the flora of the high mountain summits is almost wholly composed of characteristic species.

We designate as *higher elevations*, altitudes from about 900 meters to the mountain summits; as *middle elevations*, altitudes from about 500 meters to about 900 meters; and as *lower elevations*, lands of less than 500 meters altitude.

2. **RAINFALL.** The moist northeasterly tradewinds, almost continuous except during cyclonic disturbances, impinge upon the land masses and precipitate their vapor in the form of showers of varying intensity, from mere sprinkles to excessive cloud-bursts. The high mountains of Porto Rico cause the greater part of the atmospheric moisture to be precipitated over the northern and central districts, so that by the time the winds reach the southern coast they are dry or even drying, causing truly desert conditions to obtain in the southwestern coastal areas. In the Virgin Islands and on Vieques and Culebra, the much lower mountains do not bring about this extreme diversity of rainfall, but it is, nevertheless, locally evident, the higher parts of these islands being for the most part better supplied with rain than the lower. It is the mountain masses themselves, rather than their vegetation, that cause high rainfall, no proof whatever of a forest covering having any effect being ascertainable, but a forest covering is all important in conserving the rain and regulating the flow of streams and of rivers; the present denuded condition of most of the mountain area is detrimental and unfortunate.

We designate as *wet districts* those in which the average annual rainfall is over about 200 centimeters; as *moist districts*, those with rainfall from about 100 to about 200 centimeters; as *dry districts*,

those with rainfall of less than 100 centimeters; the wettest districts are in the higher Luquillo Mountains and in the higher western and central Cordillera Central, where the rainfall may exceed 300 centimeters; the driest areas are in the extreme southwestern coastal parts of Porto Rico, where the average fall is under 60 centimeters, and where no rain may fall during very long periods. Reference is made to the map of Porto Rico, showing the distribution of rain published by Dr. Lobeck in "The Physiography of Porto Rico" (*Sci. Survey Porto Rico and V. I.* 1: 303, fig. 1). As to Vieques and the Virgin Islands their rainfall would bring them, for the most part, within our areas regarded as moist, but locally as dry; Desecheo Island, as its name implies, is evidently dry; Mona, Culebra, Ieacos and Anegada are probably dry.

This varied distribution of rainfall is evidently a fundamental factor in the natural distribution of native plants, and this is noticed by all observers, even the most casual. In passing from north to south, over the central mountain axis of Porto Rico, the change of vegetation is, locally, abrupt, trees and other plants of the northern slopes giving place on the southern to different species, and the natural vegetation of the northern moist districts, as about San Juan and Arecibo, is seen to be almost wholly different from that of the southern, as about Ponce and Guanica.

3. SOILS. The soils of Porto Rico and the Virgin Islands are varied; they have been derived from the rocks by erosion, and distributed for the most part by water. Some regions, such as the plateau of Mona Island, parts of southern Porto Rico, mountain slopes in Porto Rico and St. Thomas and elsewhere have scarcely any soil, the vegetation springing directly from rock-crevices in which the roots of plants are firmly embedded or between loose rocks; from this condition we have soils of differing thickness, up to the very deep and thick deposits of the Porto Rican alluvial coastal plains. The soils also differ greatly in the amount of water they contain, some being very wet, others nearly dry. Along the coasts within the maritime influence, the soils contain varying amounts of salt, as also along the borders of Lake Guanica. On limestone hills and their slopes the soils are more or less calcareous, on eruptive rock hills and mountains and in granite and shale regions they are often predominantly clayey, and along rivers and especially on the northern coastal plain of Porto Rico they are almost pure sand or gravel, as also on coastal beaches and dunes.

All these soil features fundamentally govern the distribution of plants. Some species can exist only under saline conditions; some only on calcareous rocks; some only in sand; some only in marshes, some only in water. But it may be remarked that some species are far more cosmopolitan than others, being able to thrive under various conditions.

A large number of kinds of plants exist naturally only in Porto Rico and the Virgin Islands; these are termed endemic species. They are scattered in distribution, not being restricted to wet, dry, high, or low districts or to specific types of soil, though many of them appear, from our present knowledge, to be very local in distribution. All the endemic species are more or less closely related to other species inhabiting other West Indian Islands, indicating community of origin, and differentiation through isolation. The cutting of the forests over the greater part of both Porto Rico and the Virgin Islands has probably eliminated some endemic species.

All plants may be grouped in four main categories, known as Phyla or Subkingdoms, as follows:

PHYLUM 1. Spermatophyta, those which bear seeds, a seed being different from all other vegetable structures by containing an embryonic plantlet. All spermatophytes bear flowers of one kind or another, and this phylum is also called Anthophyta, or flowering plants and, to distinguish it from the three other phyla collectively, Phanerogamia. Phyla 2, 3 and 4 taken together are called Cryptogamia; all of these are seedless.

PHYLUM 2. Pteridophyta, comprises ferns and fern allies; all are flowerless and have two separate and distinct alternating generations, the one represented by the fully developed plant having root, stem and leaves, with vascular tissue and bearing spores, a spore being a single vegetable cell capable of growing into a new plant; the other, called the prothallium stage, is small, inconspicuous, grows from the spores, has no vascular tissue, is not differentiated into root, stem and leaves, and bears the sexual organs; from the female organ of the prothallium (archegonium) the fully developed spore-bearing plant again arises; the male organ, borne either on the same prothallium or on a different one, is called an antheridium.

PHYLUM 3. Bryophyta, consists of mosses and their allies; all are small flowerless plants with alternating sexual and non-

sexual (spore-bearing) generations, but the spore-bearing generation never becomes separated and independent; the sexual generation is commonly the more conspicuous and is, in most cases, differentiated into stem and leaves, while the spore-bearing generation is never thus differentiated; their spores are borne in conceptacles termed capsules, and from the spores the plant again develops. Bryophytes consist almost wholly of cellular or non-vascular tissue.

PHYLUM 4. **Thallophyta**, includes the algae, fungi and lichens; all are flowerless and their methods of reproduction and propagation are varied. They contain no vascular tissue (except a few large algae) and the plant body is not differentiated into stem and leaves. Many of them are of microscopic size.

DESCRIPTIVE FLORA.



Phylum 1. SPERMATOPHYTA.

SEED-BEARING PLANTS.

By N. L. BRITTON and PERCY WILSON.

Plants producing seeds which contain an embryo formed of one or more rudimentary leaves (cotyledons), a stem (hypocotyl, radicle), and a terminal bud (plumule), or these parts sometimes undifferentiated before germination. Microspores (pollen-grains) are borne in microsporangies (anther-sacs) on the apex or side of a modified leaf (filament). The macrosporangies (ovules) are born on the face of a flat or inrolled much modified leaf (carpel) and contain one microspore (embryo-sac); this develops the minute female prothallium, an archegone of which is fertilized by means of a tube (pollen-tube), a portion of the male prothallium sprouting from the pollen-grain.

There are two classes which differ from each other as follows:

Ovules and seeds contained in a closed cavity (ovary); stigmas 1 or more.	Class 1. ANGIOSPERMAE.
Ovules and seeds borne on the face of a scale; stigmas none.	Class 2. GYMNASPERMAE.

Class 1. ANGIOSPERMAE.

Ovules (macrosporangies) enclosed in a cavity (the ovary) formed by the infolding and uniting of the margins of a modified rudimentary leaf (carpel), or of several such leaves joined together, in which the seeds are ripened. The pollen-grains (microspores) on alighting upon the summit of the carpel (stigma) germinate, sending out a pollen-tube which penetrates its tissues and reaching an ovule enters the orifice of the latter (micropyle), and its tip coming in contact with a germ-cell in the embryo-sac, fertilization is effected. In a few cases the pollen-tube enters the ovule at the chalaza, not at the micropyle.

There are two sub-classes, distinguished as follows:

Cotyledon one; stem endogenous.	Sub-class 1. MONOCOTYLEDONES.
Cotyledons normally two; stem (with rare exceptions) exogenous.	Sub-class 2. DICOTYLEDONES.

Sub-class 1. **MONOCOTYLEDONES.**

Embryo with a single cotyledon and the first leaves of the germinating plantlet alternate. Stem composed of a ground-mass of soft tissue (parenchyma) in which bundles of wood-cells are irregularly imbedded; no distinction into wood, pith and bark. Leaves usually parallel-veined, mostly alternate and entire, commonly sheathing the stem at the base and often with no distinction of blade and petiole. Flowers mostly 3-merous or 6-merous.

†CARPELS 1 OR MORE, DISTINCT (united, at least partially, in Vallisneriaceae and others of the Naiadales, which are aquatic herbs, in Hydrocharitales and in some palms and Pandanales); parts of the usually imperfect flowers mostly unequal in number. Inflorescence various, not a true spadix.

Leaves neither compound nor flabellate.

Flowers not in the axils of dry chaffy scales.

Endosperm mealy or fleshy; perianth of bristles or chaffy scales, or wanting; flowers monoecious, spicate or capitate.

Endosperm none, or very little.

Perianth rudimentary, of 4 small sepals in *Potamogeton*, or none.

Perianth present.

Carpels distinct.

Carpels united.

Flowers in the axils of dry chaffy scales, arranged in spikes or spikelets.

Leaves pinnately or palmately compound, or flabellate; trees or shrubs.

Inflorescence a fleshy spadix, with or without a spathe; or plants minute, floating free, the flowers few or solitary on the margin or back of the thallus.

†† CARPELS UNITED INTO A COMPOUND OVARY; parts of the usually complete flowers mostly in 3's or 6's.

Seeds with endosperm.

Flowers regular, or nearly so (corolla irregular in *Commelina*.)

Endosperm mealy; ovary mostly superior.

Endosperm fleshy or horny.

Flowers very irregular; ovary inferior.

Seeds without endosperm, very numerous and minute; ovary inferior; flowers very irregular.

Order 1. PANDANALES.

Order 2. NAIADALES.

Order 3. ALISMALES.

Order 4. HYDROCHARITALES

Order 5. POALES.

Order 6. ARECALES.

Order 7. ARALES.

Order 8. XYRIDALES.

Order 9. LILIALES.

Order 10. SCITAMINALES.

Order 11. ORCHIDALES.

Order 1. PANDANALES.

Our native species aquatic or marsh plants, with narrow elongated leaves and very small, imperfect and incomplete flowers in spikes or heads. Perianth of bristles, or of chaffy scales. Ovary 1, 1-2-celled. Endosperm mealy or fleshy.

The order takes its name from the tropical genus *Pandanus*, the so-called Screw-Pine.

Family 1. **TYPHACEAE** J. St. Hil.

CAT-TAIL FAMILY.

Marsh or aquatic herbs, with perennial creeping rootstocks and erect terete stems. Leaves alternate, linear or strap-shaped, sheathing at the base, flat, slightly convex on the back. Flowers monoecious, densely crowded in compact cylindrical spike-like racemes. Staminate inflorescence terminal, above the pistillate or contiguous to it, each raceme subtended by a spathaceous fugaceous bract. Perianth of bristles. Staminate flowers with 1-7 stamens; filaments free or connate; anthers linear or oblong, 2-celled; pollen grains simple or compound. Pistillate flowers with a 1-celled ovary; ovule

solitary, pendulous; style elongate; stigma linear or spatulate, unilateral. Fruit minute, sessile or long-stipitate. Seed subcylindric or narrowly ellipsoid; albumen farinaceous; testa membranaceous; embryo cylindric, straight. The family comprises only the following genus.

1. **TYPHA** [Tourn.] L. Sp. Pl. 971. 1753.

Characters of the family. [Name ancient.] About 9 species, widely distributed in temperate and tropical regions. Type species: *Typha latifolia* L.

1. **Typha angustifolia** L. Sp. Pl. 971. 1753.

Typha latifolia domingensis Pers. Syn. Pl. 2: 532. 1807.

Typha domingensis Pers.; Kunth. Enum. 3: 92. 1841.

Typha angustifolia domingensis Griseb. Fl. Br. W. I. 512. 1864.

Typha domingensis Krouf. Verh. Zool.-Bot. Ges. Wien. 39: 163. 1889.

Stems slender, 1-3 m. tall. Leaves narrowly linear, 6-16 dm. long, or longer, 3-20 mm. broad; racemes light- or dark-brown, the staminate and pistillate portions usually separated, each 1-4 dm. long; hairs accompanying the pistillate flowers with or without club-shaped tips; pollen-grains simple; denuded rachis of the pistillate raceme roughened by the short, rigid pedicels.

Along rivers and in marshes, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola;—Bermuda; Bahamas; Jamaica; Cuba to Trinidad; southern United States to Patagonia; Europe; Asia. ENEA. ENEAS. CAT-TAIL. Its leaves are used for thatching.

Pandanus utilis Bory, SCREW-PINE, native of Madagascar, of the related family Pandanaceae, is sometimes planted for ornament and interest in Porto Rico and the Virgin Islands. It is a large, often little branched, tree-like plant with stilt-like roots and long narrow green, sword-shaped leaves armed with reddish prickles, the long-peduncled syncarpous pendulous fruits are sometimes 15 cm. in diameter. [*P. odoratissimus* of Eggers.]

Pandanus Veitchii Hort., Polynesian, is also planted for ornament; its spiny toothed leaves are dark green in the center, margined with broad bands of white or silvery white.

Order 2. NAIADALES.

Aquatic or marsh-inhabiting caulescent or acaulescent herbs, the leaves various. Flowers perfect, monoecious or dioecious. Perianth rudimentary or wanting. Parts of the flower mostly unequal in number. Carpels 1 or more, distinct and separate or united; endosperm none, or very little.

Carpels distinct.

Fam. 1. ZANNICHELLIACEAE.

Carpels united, or 1 only.

Staminate flowers of 2 long-pedicelled anthers; perianth wanting; acaulescent plants.

Fam. 2. CYMODOCEACEAE.

Staminate flowers sessile or nearly so, consisting of an anther surrounded by the perianth; caulescent plants.

Fam. 3. NAIADACEAE.

Family 1. ZANNICHELLIACEAE Dumort.

PONDWEED FAMILY.

Marine or fresh-water perennials, with floating or submerged leaves or both. Flowers monoecious or perfect, inconspicuous. Perianth present or wanting. Stamens 1-4. Carpels 1-seeded. Fruit drupe-like. Endosperm wanting.

About four genera and 90 species.

Perianth wanting; stamens 2.

Perianth of 4 segments; stamens 4.

1. *Ruppia*.

2. *Potamogeton*.



1. **RUPPIA** L. Sp. Pl. 127. 1753.

Submerged, usually salt or brackish water herbs, with long thread-like, forking stems, and slender alternate 1-nerved leaves. Flowers 2 or more together within the leaf-sheath on a short peduncle which usually becomes greatly elongated after flowering, and is ultimately a loosely coiled spiral. Perianth wanting. Stamens 2; anthers 2-celled, sessile. Carpels 4, 1-ovuled, sessile at first, at length usually long-stipitate; stigmas peltate; ovule pendulous. Drupelets oblique or equilateral, crowned with the long or short-style. Embryo curved. [Named in honor of Heinrich Bernhard Ruppianus, a German botanist of the 18th century.] About three species, of wide distribution. Type species: *Ruppia maritima* L.

Stipes of the drupelets free.

1. *R. maritima*

Stipes of the drupelets united into a column.

2. *R. anomala*.

1. **Ruppia maritima** L. Sp. Pl. 127. 1753.

Ruppia rostellata Koch; Reichb. Icon. Pl. Crit. 2: 66. 1824.

Stems pale brown or whitish, usually branched, often 1 m. long. Leaves linear-capillary, 3-10 cm. long, 0.3-0.8 mm. wide; sheaths with a short free tip; fruiting peduncles capillary, sometimes 3 dm. long; pedicles 4 or more in a cluster, 0.8-3.5 cm. long; drupes ovoid, 2-3 mm. long, often oblique or gibbous at the base, pointed with the long style.

In shallow bays, pools, and lagoons, Porto Rico; Culebra; Vieques; St. Thomas; St. Jan; St. Croix:- Atlantic and Pacific coasts of North America, sometimes occurring in saline pools in the interior; Bermuda; Bahamas to Trinidad; temperate and tropical regions of the Old World. DITCH-GRASS.

2. **Ruppia anomala** Ostenfeld, Bull. Torrey Club 42: 659. 1915.

Stems and leaves similar to the preceding. Peduncle short, not becoming greatly elongated after flowering; stipes united into a column at the top of which the drupelets are arranged in a star-like manner.

Border of Lake Guanica. Endemic.

2. **POTAMOGETON** [Tourn.] L. Sp. Pl. 126. 1753.

Herbs mostly of fresh-water ponds and streams, with submerged or floating stems. Leaves flat, 2-ranked, alternate or the uppermost opposite, often of two kinds, submerged and floating, the submerged leaves mostly thin and narrow, the floating coriaceous or subcoriaceous and broad. Stipules either free from the leaf-bases or closely adnate to them. Inflorescence spicate, axillary. Perianth segments 4. Stamens 4; anthers 2-celled. Ovaries 4, rarely only 1, with an ascending campylotropous ovule; stigma sessile or on a short style. Fruit of 4 drupelets, the pericarp usually thin and hard or spongy. Seeds crustaceous, with a complete or incomplete spiral embryo. [Greek, in allusion to the aquatic habit.] About 85 species, natives of temperate and tropical regions. Type species: *Potamogeton natans* L.

With sessile, submerged leaves only, the blades linear, without a coarsely cellular-reticulate space each side of the midrib; spikes capitate.

1. *P. foliosus*.

With floating and submerged leaves; spikes cylindrical.

Submerged leaves sessile, the blades linear, with a coarsely cellular-reticulate space each side of the midrib.

2. *P. ephydrus*.

Submerged leaves petioled, the blades narrowly lanceolate to elliptic-lanceolate, without a coarsely cellular-reticulate space each side of the midrib.

3. *P. fluitans*.

1. *Potamogeton foliosus* Raf. Med. Repos. II. 5: 354. 1808.

Potamogeton pauciflorus Pursh, Fl. Am. Sept. 121. 1814.

Stems filiform, flattened. Leaves all submerged, narrowly linear, 2-6 cm. long, 0.5-2 mm. broad, acute at the apex, obscurely 3-5-nerved; peduncles 0.5-1.8 mm. long; spikes capitate, few-flowered, on short, more or less clavate peduncles; fruit lenticular or nearly orbicular, the back more or less crested; embryo an incomplete spiral, the apex pointing towards the base or outside it.

In streams, Porto Rico:—Cuba; Jamaica; Hispaniola; United States to Brazil; also recorded from the Sandwich Islands.

2. *Potamogeton epihydrus* Raf. Med. Repos. II. 5: 534. 1808.

Potamogeton Nuttallii Cham. & Schl. Linnaea 2: 226. 1827.

Potamogeton pennsylvanicus Cham. & Schl. Linnaea 2: 227. 1827.

Potamogeton Claytoni Tuckerm. Am. Jour. Sci. 45: 38. 1843.

Potamogeton pennsylvanicus portoricensis Graebner; Urban, Symb. Ant. 4: 73. 1903.

Potamogeton Nuttallii portoricensis Graebner, Pflanzenreich 4¹¹: 56. 1907.

Stem slender, compressed, simple or sometimes branched. Floating leaves petioled, the blades oblong-elliptic to elliptic, occasionally somewhat obovate, 3-8 cm. long, 1-2.5 cm. or more broad, obtuse or acutish at the apex, narrowed at the acute base, many-nerved; submerged leaves sessile, the blades linear or linear-lanceolate, 5-14 cm. long, 2-4 mm. or more broad, with a coarsely cellular-reticulate space each side of the midrib; peduncles equalling or much longer than the spike; spikes cylindrical, 1.5-3.7 cm. long, occasionally longer, many-flowered; fruit round-obovoid, 3-keeled, the sides flat and indistinctly impressed; embryo a complete spiral, the curved apex pointing inside the base and upward.

Porto Rico, according to Graebner:—temperate continental North America.

3. *Potamogeton fruitans* Roth, Tent. Fl. Germ. 1: 72. 1788.

Potamogeton occidentalis Sieber; Cham. & Schl. Linnaea 2: 224. 1827.

Potamogeton americanus Cham. & Schl. Linnaea 2: 226. 1827.

Stem terete or nearly so, often branched below. Floating leaves long-petioled, the blades lanceolate to broadly elliptic, 4-13 cm. long, 1-4 cm. broad, acute or acuminate at the apex, rounded or acute at the base, many-nerved; submerged leaves petioled, the blades pellucid, narrowly lanceolate to elliptic-lanceolate, 10-25 cm. long, 7-27 mm. broad; peduncles somewhat thickened upward, usually much longer than the spike; spikes cylindrical, 2-5 cm. long, many-flowered; fruit obliquely obovoid, 3-4.5 mm. long, 2-3 mm. broad, the back more or less prominently crested; embryo a complete spiral, the curved apex pointing just inside the base.

In streams, Porto Rico:—Cuba; Hispaniola; Jamaica; Martinique; Trinidad; continental America; Europe; Asia and Africa. Recorded by Bello as *P. plantagineus* Du Cruz. *P. Leschenaultii* Cham & Schl. of Urban's Symb. Ant. 4: 72. 1903, apparently belongs here.

Family 2. **CYMODOCEACEAE** Kerner.

MANATEE-GRASS FAMILY.

Submerged perennial herbs of sandy sea bottoms, with long creeping rootstocks. Leaves linear, sheathing at the base. Flowers monoecious or dioecious, solitary or cymose. Perianth wanting. Staminate flowers of 2 long-pedicelled anthers, the anthers 2-celled, longitudinally dehiscent. Pistillate flowers of 1 or 2 carpels. Stigmas 1 or 2, slender. Fruit nut-like, 1-seeded. Embryo ovoid or ellipsoid. Two known genera, as follows:

Stigmas 2; leaf-blades terete or nearly so.
Stigma 1; leaf-blades flat.

1. *Cymodocea*.
2. *Halodule*.

1. **CYMODOCEA** Konig; Konig & Sims, Ann. Bot. 2: 96. 1805.

Submerged marine herbs, with slender elongated rootstocks. Staminate flowers consisting of two anthers on the end of a long pedicel, the anthers equally attached. Pistillate flowers of 2 carpels. Stigmas 2, slender. Fruit indehiscent, 1-seeded. Seeds pendulous. [Named for Cymodoce, one of the Nereids.] About 7 species, tropical and subtropical. Type species: *Cymodocea aquorea* Konig.

1. **Cymodocea manatorum** Aschers. Stiz.-ber. Ges. Nat. Freunde Berlin 1868: 19. 1868.

Phycagrostis manatorum Kuntze, Rev. Gen. 744. 1891.

Rootstock branched, 7 dm. long or longer. Leaves linear, grass-like, terete or semi-terete, 0.4–3.2 dm. long, 0.8–1.8 mm. wide, their bases enclosed by membranous sheaths 1–5 cm. long. Fruit ellipsoid, flattened, 5–6.5 mm. long, 2.5 mm. broad, beaked by the persistent style; seed elliptic, 2.5–3 mm. long.

Shallow salt water, Porto Rico; Culebra; St. Thomas; St. Croix; St. Jan.;—Florida; Mississippi; Louisiana; Jamaica; Bermuda to Cuba, Martinique and Curacao. MANATEE-GRASS.

2. **HALODULE** Endl. Gen. 1368. 1841.

Submerged herbs, with jointed rootstocks. Staminate flowers consisting of 2 anthers attached to the end of a long pedicel, the anthers unequally attached. Pistillate flower a single naked carpel. Style short, terminated by a slender, solitary stigma. Fruit small, globose, somewhat compressed. [Greek, referring to the saline habit.] About two species of tropical and subtropical waters. Type species: *Diplanthera tridentata* Steinh.

1. **Halodule Wrightii** Aschers. Stiz.-ber. Ges. Nat. Freunde 1868: 19. 1868.

Diplanthera Wrightii Aschers. in E. & P. Nat. Pfl. Nacht. 37. 1897.

Rootstocks jointed, rooting at the nodes. Leaves narrowly linear, flat, 4–30 cm. long, occasionally longer, 1 mm. wide or less, acute at the tip, sheathing at the base, the scarious sheaths 1–3 cm. long; anthers 6 mm. long; fruit black.

Shallow salt water, Porto Rico; Culebrita; St. Thomas; St. Croix;—Florida; Jamaica; Bahamas to Cuba and Martinique; Panama. Also recorded from Africa.

Family 3. **NAIADACEAE**. (Lindl.) Aesch.**NAIAS** FAMILY.

Slender submerged aquatics, with fibrous roots and branching stems. Leaves alternate, opposite or whorled, the blades linear, spiny on the margins or the back, or both, sheathing at the base. Leaf-sheaths rounded or auriculate, entire or toothed. Flowers monoecious or dioecious, solitary and axillary. Staminate flowers with a double perianth-like envelope, the inner hyaline, the outer 4-lobed or entire. Stamen 1. Anther 1-4-celled. Pistillate flower of a single pistil. Style short or wanting. Stigmas 2-4. Fruit a little drupelet. Seed solitary. Embryo straight.

The family comprises only the following genus.

1. **NAIAS** L. Sp. Pl. 1015. 1753.

Characters of the family. [Greek, water-nymph.] About 30 species, of wide geographic distribution. Type species: *Naias marina* L.

Leaves flaccid, scarcely toothed; flowers monoecious.
 Leaves rigid, coarsely toothed; flowers dioecious.

1. *N. guadalupensis*.
2. *N. marina*.

1. ***Naias guadalupensis*** (Spreng.) Morong, Mem. Torrey Club 3²: 60. 1893.

Caulinia guadalupensis Spreng. Syst. 1: 20. 1825.

Naias microdon A. Br. Sitz.-ber. Ges. Nat. Freunde Berlin 1868: 17. 1868.

Naias microdon guadalupensis A. Br. loc. cit. 1868.

Naias microdon curassavica A. Br. loc. cit. 1868.

Naias flexilis guadalupensis A. Br. Jour. Bot. 2: 276. 1864.

Naias flexilis curassavica A. Br. loc. cit. 277. 1864.

Naias guadalupensis curassavica Mangus & Rendle, Symb. Ant. 4: 74. 1903.

Stems very slender, 2–7 dm. long. Leaves numerous, opposite or in fascicles, the blades linear, 10–25 mm. long, 0.5–1.5 mm. broad, acute or obtuse at the apex, the margin with numerous minute teeth; sheaths rounded, with 5–10 teeth on each margin; fruit 2 mm. long; seeds narrowly ellipsoid, straw-colored, conspicuously reticulate. [*N. major* of Bello, not of Allioni.]

In streams, pools and lakes, Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe; Curaçao; temperate and tropical continental America. Recorded by Krebs from St. Thomas.

2. ***Naias marina*** L. Sp. Pl. 1015. 1753.

Stems rather stout, much branched, 2–4 dm. long, the internodes spinulos. Leaves rigid, coarsely triangular-dentate, linear, 1–4.5 cm. long; flowers dioecious; fruit 3–4 mm. long.

Laguna Tortuguero:—Cuba; temperate and subtropical regions.

Order 3. ALISMALES.

Aquatic or uliginous herbs, mostly acaulescent and with rootstocks. Leaves alternate, mostly basal, broad or narrow. Flowers perfect, monoecious or dioecious, clustered. Calyx of 3 sepals. Corolla of 3 thin petals, or sometimes wanting. Stamens several or many; filaments slender or short; anthers with inconspicuous connectives. Pistils few to many, distinct; ovary superior; style stout or slender; stigma small. Fruit a head of achenes in the following family.

Family 1. ALISMACEAE DC.

WATER-PLANTAIN FAMILY.

Marsh or aquatic perennial, or sometimes annual herbs, with fibrous roots, scapose stems and basal leaves. Inflorescence simple or branched. Flowers perfect or unisexual, whorled, born in terminal racemes or panicles. Receptacle flat, convex or globose. Sepals 3, persistent. Petals 3, deciduous. Stamens 6 or more. Anthers 2-celled. Ovaries 1-celled, usually with a single ovule in each cavity. Fruit a head of flat or turgid achenes. Seeds curved. Embryo horseshoe-shaped. About 13 genera and 75 species, of wide distribution in fresh water marshes, ponds and streams.

Flowers perfect.

Fruiting heads not echinate; achenes turgid, beakless or obscurely beaked.

Fruiting heads echinate; achenes mostly flat, prominently beaked.

Flowers monoecious or dioecious, the upper flowers of the inflorescence staminate, the lower pistillate.

1. *Helianthium*.

2. *Echinodorus*.

3. *Sagittaria*.

1. ***HELIANTHIUM*** Engelm.; Britton, Man. ed. 2. 54. 1905.

Annual or perennial marsh or aquatic herbs, sometimes with creeping pro-

liferous shoots, and linear or ovate, erect, ascending, or floating leaves. Scapes terminating in a few-flowered whorl or a many-flowered panicle, the pedicels slender, spreading or recurved in fruit. Flowers perfect. Sepals 3, embracing the fruiting-head or reflexed beneath it. Petals 3. Stamens 6 or 9; filaments elongate; anthers short. Achenes several, borne on the elevated receptacle. Style not apical, minute. Achenes forming a globular or depressed head, ribbed, obscurely beaked or beakless. [Greek, sunflower.] About two species, natives of temperate and tropical regions. Type species: *Echinodorus parvulus* Engelm.

1. **Helianthium tenellum** (Mart.) Britton, Man. ed. 2, 54. 1905.

Alisma tenellum Mart.; R. & S. Syst. Veg. 7: 1600. 1830.
Echinodorus parvulus Engelm. in A. Gray, Man. ed. 2, 438. 1856.
Echinodorus tenellus Buch. Abh. Nat. Ver. Bremen 2: 18. 1868.
Helianthium parvulum Small, N. A. Flora 17: 45. 1909.

A rather delicate stoloniferous herb, 3–15 cm. high. Leaves erect or ascending, linear-lanceolate to lanceolate, 0.8–5 cm. long, 2–6 mm. broad, acute at both ends, slender petioled, when submersed becoming linear phyllodia; scape often surpassing the leaves, commonly reclined; umbel 2–8-flowered; bracts lanceolate; pedicels slender, 1–3.5 cm. long, unequal, reflexed in fruit; flower 6 mm. broad; sepals ovate, obtuse; petals obovate, emarginate; styles much shorter than the ovary; fruiting heads globular, 3–4 mm. in diameter; achenes 1–1.5 mm. long.

Submersed or in mud, northern coastal plain of Porto Rico.—United States; continental tropical America; Cuba; Jamaica; Santo Domingo.

2. **ECHINODORUS** Rich.; Engelm. in A. Gray, Man. 460. 1848.

Perennial or annual marsh herbs, with erect or ascending, long-petioled leaves. Scape often longer than the leaves. Flowers perfect, mostly in remote whorled racemes; sepals 3, persistent; petals 3, deciduous; stamens 12–30, rarely fewer; carpels numerous, inserted on a convex or globose receptacle; style obliquely apical, persistent; stigma simple. Achenes more or less compressed, ribbed and beaked, forming bristly heads. [Greek, in allusion to the bristly heads of fruit.] About 16 species, mostly natives of tropical America. Type species: *Alisma rostratum* Nutt.

1. **Echinodorus cordifolius** (L.) Griseb. Abh. K. Ges. Wiss. Gött. 7: 257. 1857.

Alisma cordifolia L. Sp. Pl. 343. 1753.
Alisma Berteroanum Balbis; R. & S. Syst. Veg. 7: 1605. 1830.
Alisma rostratum Nutt. Trans. Am. Phil. Soc. II. 5: 159. 1837.
Echinodorus rostratus Engelm. in A. Gray, Man. 460. 1848.
Sagittaria rostrata Ktze. Rev. Gen. 3: 326. 1898.

Perennial, with a short erect rootstock and angled stems and petioles. Leaves long-petioled, the blades ovate to broadly ovate, occasionally ovate-lanceolate, 5–20 cm. long, 2–18 cm. broad, obtuse or acute at the apex, truncate or cordate at the base, punctate with pellucid lines, the submersed ones thin and pellucid; scapes solitary or several, up to 1.5 m. tall, surpassing the leaves, simple or verticillately branched; flowers 3–9 in each verticil; pedicels 7–15 mm. long, nearly erect after flowering; sepals elliptic-ovate to broadly ovate, 4–5 mm. long, acutish or obtuse; petals white, often about twice as long as the sepals; fruiting heads bur-like, globose to ovoid, 5–9 mm. long; achenes narrowly obovate, 1.9–2.5 mm. long, the beak slender, about one half as long as the body.

Marshy places along fresh water streams and borders of ponds, Porto Rico; St. Thomas; St. Croix.—United States; Mexico and Central America; Bahamas; Jamaica; Cuba to St. Thomas and Barbados; Curacao.

3. **SAGITTARIA** L. Sp. Pl. 993. 1753.

Perennial bog or water plants, with tuber-bearing or irregularly thickened rootstocks. Leaves long-petioled, with a sagittate or lanceolate blade, or the leaves reduced to bladeless phyllodes. Flowers monoecious or dioecious, borne in verticils of 3's near the top of the scapes, the staminate uppermost. Sepals 3. Petals 3. Stamens numerous, inserted on the convex or globose receptacle; anthers 2-celled, opening by lateral slits. Pistillate flowers with numerous distinct carpels, sometimes with imperfect stamens. Achenes numerous, densely crowded in globose or subglobose heads, compressed and often wing-margined. Seed erect, curved. [Latin, referring to the arrow-shaped leaves of some species.] About 40 species, natives of temperature and tropical regions, known as **ARROW-LEAF**. Type species: *Sagittaria sagittifolia* L.

Leaf-blades without basal lobes.
Leaf-blades with basal lobes.

1. *S. lancifolia*.
2. *S. intermedia*.

1. **Sagittaria lancifolia** L. Syst. ed. 10, 1270. 1759.

Sagittaria lancifolia major Micheli, in DC. Monog. Phan. 3: 73. 1881.
Sagittaria lancifolia media Micheli, in DC. Monog. Phan. 3: 73. 1881.

A monoecious, often rather stout, perennial herb, 4–20 dm. tall. Leaves long-petioled, the blades linear-lanceolate to broadly lanceolate or elliptic, 2–5 dm. long, 2–18 cm. broad, acute or acuminate at both ends; petioles more or less black-mottled; scape usually taller than the leaves, commonly branched; bracts linear-lanceolate or lanceolate, 1–3 cm. long, acute or acuminate, striate; pedicels 1.5–3 cm. long, rather slender; flowers 4–5 cm. broad; sepals obtuse; petals obovate; filaments subulate, pubescent, equalling or longer than the anthers; fruiting heads 10–14 mm. in diameter; achenes cuneate and somewhat falcate, 2–3 mm. long, without tuberculate faces, the beak less than one half the length of the body.

Marshy places and borders of ponds, Porto Rico:—southern United States to Argentina; Bahamas; Jamaica; Cuba to Barbados. Recorded by Bello as *Sagittaria acutifolia* L.f. In the white sand areas of the northern coastal plain the plant has narrowly linear leaves; in muddy places the leaves are much broader.

2. **Sagittaria intermedia** Micheli, in DC. Monog. Phan. 3: 80. 1881.

A perennial herb, 2–6 dm. tall. Leaves long-petioled, the blades hastate, triangular-hastate, or occasionally sagittate, 6–18 cm. long, the terminal lobe lanceolate to deltoid, acute or obtuse, the basal lobes narrower and usually longer than the terminal lobe; scapes erect, usually shorter than the leaves, simple or branched; bracts ovate, obtuse, 3–5 mm. long; pedicels 0.4–1.8 cm. long, those of the pistillate flowers much thicker than those of the staminate flowers; sepals ovate to orbicular-ovate, obtuse or acutish; filaments glabrous, anthers about as long as the filaments; fruiting heads 10–12 mm. in diameter; achenes obovate-cuneate, 2–2.5 mm. long, with tuberculate faces, the slender beak short.

Marshes, wet woods and ditches at lower elevations; Porto Rico:—Cuba; Jamaica; Hispaniola. Recorded by Grisebach as *Sagittaria acutifolia* L.f., and by Bello as *Sagittaria lancifolia* L.

Order 4. **HYDROCHARITALES**.

Mostly submersed herbs, perennial by rootstocks or stolons. Flowers monoecious polygamous or dioecious, arising from spathes. Perianth of 2 d's-similar series of parts or the corolla wanting. Stamens 3–12. Carpels 3–15, united. Ovary inferior, with several parietal placentae or several-celled. Endosperm none.

Gynoeceium 2-5-carpellary; ovary 1-celled, with 2-5 parietal placentae; stigmas usually 3.
Gynoeceium 6-9-carpellary; ovary 6-9-celled (imperfectly so in *Hydromystria*); stigmas 6-9.

Fam. 1. ELODEACEAE.

Fam. 2. HYDROCHARITACEAE.

Family 1. **ELODEACEAE** Dumort.

TAPE-GRASS FAMILY.

Perennial marine or fresh-water herbs, with rootstocks or stolons, submerged or the leaves sometimes floating. Leaves opposite, whorled, or fasciated. Flowers small, monoecious, dioecious, or polygamous, enclosed in a spathe composed of 1-3 bracts. Calyx of the pistillate flowers with a tube and 3 lobes or sepals, that of the staminate flowers often small or obsolete. Petals 3, often rudimentary or wanting. Stamens 3-12; filaments short or none. Pistil 1; ovary 1-celled, with 2-5 parietal placentae; ovules usually numerous, orthotropous or anatropous. Fruit small, indehiscent. Seeds without endosperm. About 6 genera and 35 species, natives of temperate and tropical regions.

1. **HALOPHILA** Thouars; Gaud. Voy. Freyc. Bot. 429. 1829.

Small submerged marine herbs, with slender creeping rootstocks. Flowers monoecious or dioecious, solitary or two enclosed in a 2-leaved sheath. Staminate flowers peduncled; sepals 3; anthers 3, subsessile, 2- or 4-celled, extrorse. Pistillate flowers sessile, with 3 minute sepals, a 1-celled ovary and a 3-parted style. Fruit enclosed in the spathe. Seeds numerous, the embryo with spirally twisted cotyledons. [Greek, salt-loving.] About 7 species of tropical distribution. Type species: *Caulinia ovalis* R. Br.

Erect shoots very short, 1-3 mm. long, with only one pair of leaves, and a pair of scales at the base; leaf-blades nearly entire margined.
Erect shoots 1-4 cm. long, bearing 2 pairs of subverticillate leaves at the apex, and a pair of scales at or below the middle; leaf-blades spinulose-serrate.

1. *H. Baillonis*.2. *H. Aschersonii*.1. **Halophila Baillonis** Aschers. Jour. Linn. Soc. 14: 317. 1874.

Rhizome filiform, branched. Erect shoots very short, 1-3 mm. long, bearing a pair of erect scales at the base and one pair of leaves at the summit; leaves with slender petioles 4-10 mm. long, the blades thin, oblong-elliptic or elliptic, 1-3 cm. long, 3-8 mm. wide, rounded at the apex, acute at the base, hispidulous on both sides, the margin minutely denticulate or almost entire; staminate flower pedicelled; sepals oval, obtuse; anthers oblong; pistillate flowers sessile, with three minute sepals; stigmas sessile, filiform; capsule 3.5-4 mm. long, about 2 mm. broad; seeds globose or subglobose, about 0.3 mm. in diameter.

In shallow or deep water, Porto Rico; Culebra; St. Thomas; St. Croix:—Jamaica; Cuba to Martinique.

2. **Halophila Aschersonii** Ostenf. Bot. Tidsskr. 24: 239. 1902.

Rhizome slender, sometimes 1.3 mm. thick. Erect shoots 1-4 cm. long, bearing a pair of erect scales at or below the middle and 2 pairs of subverticillate leaves at the summit; leaves short-petioled, the petioles 3-5 mm. long; the blades elliptic, 0.8-2 cm. long, 4-8 mm. wide, obtuse at both ends, glabrous or nearly so, spinulose-serrate on the margins; pistillate flowers sessile in the axils of the upper pairs of leaves, surrounded by two lanceolate acute bracts; sepals minute; stigmas 2 or 3; staminate flowers unknown.

Muddy bottoms of bays, Porto Rico; Culebra; St. Croix:—Jamaica.

Family 2. **HYDROCHARITACEAE** Aschers.

FROG'S-BIT FAMILY.

Submersed marine, mud-inhabiting, or floating fresh-water herbs, usually with rootstocks or stolons. Leaves clustered on the short crown. Flowers monoecious or dioecious, enclosed in spathe of distinct or united bracts. Perianth regular or nearly so, of 3 petaloid sepals, or sepals and petals each 3, rudimentary or wanting in the pistillate flowers. Stamens 6-12. Filaments distinct or partly united. Anthers 2-4-celled. Gynoecium of 6-15 united pistils. Ovary inferior, 6-15-celled. Styles or stigmas as many as the cells of the ovary. Ovules numerous. Fruit usually indehiscent. Seeds without endosperm. About 8 genera and 30 species, of wide distribution in warm and temperate regions.

Marine plants; leaves sessile, linear; anthers 4-celled.

Fresh-water plants; leaves distinctly petioled, the blades ovate to sub-orbicular; anthers 2-celled.

1. *Thalassia*.

2. *Hydromystria*.

1. **THALASSIA** Solander; König & Sims, Ann. Bot. 2: 93, 96. 1805.

Marine herbs, with elongated rootstocks. Leaves linear, elongate, clustered at the nodes of the rootstock. Scape arising from the cluster of leaves; spathe tubular, 2-cleft. Flowers dioecious, solitary; staminate flowers pedicelled; perianth of 3 petaloid sepals; stamens 9; filaments very short or obsolete; anthers opening laterally. Pistillate flowers nearly sessile in the spathe; ovary 6-12-celled. Fruit stalked, mamillate or echinate, opening by valves. Seeds numerous. [Greek, referring to its growth in the ocean.] Two known species, the following typical.

1. **Thalassia testudinum** König; König & Sims, Ann. Bot. 2: 96. 1805.

Plant submersed, the base of the short stem covered by the persistent remains of the old leaves. Leaves 2-5, sheathing the stem, the blades linear-strap-shaped, 0.5-3.5 dm. long, 6.5-11 mm. wide, rounded at the apex, withering-persistent; scapes solitary; lobes of the spathe elliptic, papillose-dentate on the margins; perianth lobes of both staminate and pistillate flowers oblong, 10-12 mm. long, rounded at the apex; anthers linear, 8 mm. long; stigmas 9-12, linear-fusiform, pilose, grooved on the inside, about 1 cm. long; fruit elliptic-fusiform, short-stalked and short-beaked, mammillate. [? *Zostera oceanea* of Krebs.]

In shallow salt water, Porto Rico; St. Thomas; St. Jan; St. Croix;—Bermuda; Florida; throughout the West Indies; northern South America. PALMAS DEL MAR. TURTLE-GRASS.

2. **HYDROMYSTRIA** G. F. W. Meyer, Fl. Esseq. 152. 1818.

Stoloniferous fresh-water plants. Leaves distinctly petioled; blades ovate to suborbicular, somewhat spongy beneath. Flowers monoecious or dioecious, solitary or the staminate ones 2 or 3, enclosed in a 2-cleft spathe. Sepals 3. Petals 3, rudimentary or wanting in the pistillate flowers. Stamens 6-12, distinct; anthers linear. Gynoecium of about 6 united pistils; ovary one-celled with 6 placentae; styles 6; stigmas curved. Fruit ellipsoid, one-celled, many seeded. (Greek, "water-spoon," alluding to the aquatic habit of the plant and spoon-shaped leaves.) Two or three species, natives of tropical America. Type species: *Hydromystria stolonifera* G. F. W. Meyer.

1. *Hydromystria stolonifera* G. F. W. Meyer, Fl. Esseq. 153. 1818.*Limnobiium stoloniferum* Griseb. Fl. Br. W. I. 506. 1861.

Petioles 3–25 cm. long, usually tapering upwards from the base; leaf-blades ovate to suborbicular, 2–8 cm. long, 1.5–6.5 cm. broad, entire, fleshy. Sepals in the staminate flowers lanceolate, spreading; petals linear-filiform, spreading, about half as long as the sepals; filaments subulate, shorter than the anthers; hypanthium in the pistillate flowers tubular; sepals lanceolate.

In ditches and ponds, Porto Rico:—Cuba; Santo Domingo; Martinique; Trinidad; South America.

Order 5. POALES.

Grasses and sedges. Monocotyledonous plants, mostly herbaceous, with leafy or leafless, usually simple, stems (culms), the leaves usually narrow and elongated, entire or minutely serrulate. Flowers mostly perfect, small, incomplete, in the axils of dry, chaffy scales (glumes) arranged in spikes or spikelets.

Fruit a caryopsis (grain); culm mostly hollow.
Fruit an achene; culm mostly solid.

Fam. 1. POACEAE.
Fam. 2. CYPERACEAE.

Family 1. **POACEAE** R. Br.

GRASS FAMILY.

Annual or perennial herbs, of various habit, rarely shrubs or trees. Culms (stems) generally hollow, but occasionally solid, the nodes closed. Leaves sheathing, the sheaths usually open to the base on the side opposite the blade; a scarios or cartilaginous ring, naked or hairy, rarely wanting, called the ligule, is borne at the orifice of the sheath. Inflorescence spicate, racemose or paniculate, consisting of spikelets composed of two to many, 2-ranked imbricated bracts, called scales (glumes), the two lowest in the complete spikelet always empty, one or both of these sometimes wanting. One or more of the upper scales, except sometimes the terminal ones, contains in the axil a flower, which is usually enclosed by a bract-like awnless organ called the palet, placed opposite the scale and with its back toward the axis (rachilla) of the spikelet, generally 2-keeled; sometimes the palet is present without the flower, and vice versa. Flowers perfect or staminate, sometimes monoecious or dioecious, subtended by 1–3 minute hyaline scales called the lodicules. Stamens 1–6, usually 3. Anthers 2-celled, versatile. Ovary 1-celled, 1-ovuled. Styles 1–3, commonly 2 and lateral. Stigmas hairy or plumose. Fruit a seed-like grain (caryopsis). Endosperm starchy. About 3500 species widely distributed throughout the world, growing in water and on all kinds of soil. Those yielding food-grains are called cereals. The species are more numerous in tropical countries, while the number of individuals is much greater in temperate regions, often forming extended areas of turf.

We gratefully acknowledge much assistance in the determination of specimens from Prof. A. S. Hitchcock and Mrs. Agnes Chase, as well as from their publications on American grasses.

A. Pedicels jointed below the spikelets; spikelets mostly with only 1 perfect flower, this terminal. [See ORYZEAE.]

1. Lower scales indurated; fruiting scale and palet hyaline or membranous.

a. Inflorescence monoecious [MAYDEAE].

Fruiting spikelets aggregated, enclosed in large foliaceous bracts.

Fruiting spikelets enclosed in a globose bony involucre.

b. Inflorescence not monoecious.

1. *Zea*.
2. *Coix*.

1. Spikelets paired, one sessile the other stalked (See *Sorghastrum*) [Tribe ANDROPOGONEAE].
 *Axis of the racemes continuous.
 **Axis of the racemes articulated.
 †Spikelets all perfect.
 ††Sessile spikelet mostly perfect, the stalked one staminate or rudimentary.
 ‡Fertile spikelet without a callus.
 §Inflorescence a dense silky brown panicle.
 §§Inflorescence various, not a dense silky panicle.
 αPedicel of the sterile spikelet thickened.
 ααPedicel of the sterile spikelet not thickened
 βSpikelets in racemes.
 γRacemes sessile or short-stalked.
 δRacemes 1 to many, not forking.
 Spikelets laterally flattened.
 Spikelets dorsally flattened.
 Raceme 1; pedicels clavate
 Racemes usually more than 1; pedicels not clavate.
 Pedicels filiform.
 Awn borne at the sinus of the 2-cleft fertile scale.
 Awn terminating the fertile scale of the spikelet.
 Pedicels flat.
 δδRacemes 2, forking, with staminate awnless spikelet in the fork.
 γγRacemes long-stalked, verticillate.
 ββSpikelets in panicles.
 Stalked spikelet staminate.
 Stalked spikelet reduced to a pedicel.
 ††Fertile spikelet with a hairy-pointed callus.
2. Spikelets all alike [Tribe NAZIEAE].
 Spikelets not prickly.
 Spikelets prickly, like little burs.
11. †Lower scales membranous; fruiting scale and palet more or less indurated.
 a. Fruiting scale and palet scarcely more indurated than the lower scales [Tribe MELNIDEAE].
 b. Fruiting scale and palet definitely firmer than the lower scales [Tribe PANICEAE].
 1. Inflorescence not monoecious.
 *Axis of the inflorescence not corky thickened.
 †Spikelets not subtended by prickles or bristles.
 ‡Fruit cartilaginous, not rigid, papillose
 Fruit open at the top; inflorescence a narrow panicle.
 Fruit not open at the top; inflorescence of digitate or flabellate spike-like racemes.
 Spikelets long-silky; racemes flabellate.
 Spikelets glabrous or puberulent; racemes digitate.
 ††Fruit rigid, mostly smooth.
 §Back of the fruit turned away from the rachis of the solitary, subsessile spikelets.
 Inflorescence of secund racemes; a ring-like callus at the base of the spikelet.
 Inflorescence of spike-like racemes; no callus.
3. *Imperata*.
 4. *Saccharum*.
 5. *Eriochrysis*.
 6. *Ryttilix*
 7. *Diectomis*.
 8. *Schizachyrium*
 9. *Andropogon*
 10. *Dichanthium*.
 11. *Amphilophis*.
 12. *Cymbopogon*.
 13. *Anatherum*.
 14. *Holcus*.
 15. *Sorghastrum*.
 16. *Heteropogon*.
 17. *Anthephora*.
 18. *Nazia*.
 19. *Arundinella*.
 20. *Leptocoryphium*.
 21. *Valota*.
 22. *Syntherisma*.
 23. *Eriochloa*.
 24. *Axonopus*.

- §§Back of the fruit turned toward the rachis of the spikelet.
 α Lower scale wanting (scales 3, rarely 4); spikelets in spike-like racemes.
 $\alpha\alpha$ Lower scale present (scales 4); spikelets mostly in panicles.
 β Scales awnless.
 γ Lower flower of the spikelet staminate or neutral; the upper perfect.
 Inflorescence an open or contracted panicle.
 Culms not woody.
 Fruiting scale without appendages or excavations.
 Fruiting scale with basal appendages or excavations.
 Culms woody, half climbing.
 Inflorescence a dense spike-like panicle.
 Second scale saccate; fruit stipitate.
 Second scale not saccate; fruit sessile.
 $\gamma\gamma$ Lower flower of the spikelet usually perfect, the upper perfect.
 $\beta\beta$ Scales, or some of them, awned or mucronate.
 Inflorescence of secund racemes.
 Inflorescence paniculate.
 ††Spikelets subtended by prickles or bristles.
 Spikelets deciduous, the bristles persistent.
 Bristles or prickles deciduous with the spikelets.
 Bristles distinct, often plumose.
 Prickles united into an involucre or nearly separate.
 Prickles bristle-like, united only at base.
 Prickles united, forming a 2-valved bur.
 **Axis of the inflorescence corky thickened, the spikelets sunken in it.
2. Inflorescence monoecious.
 Panicles terminal, bearing pistillate spikelets above and staminate below.
 Panicles axillary, or both axillary and terminal, the terminal one wholly of staminate spikelets.
- B. Spikelets mostly jointed above the lower empty persistent scales, usually several-flowered, sometimes 1-flowered.
- I. Culms coriaceous.
- a. Lower scales mostly reduced or wanting; spikelets 1-flowered. [Tribe ORYZEAE.]
 Inflorescence monoecious.
 Inflorescence not monoecious.
 Fruiting scales awned; lower scales present.
 Scales awnless; lower scales wanting.
- b. Lower scales present.
1. Spikelets 1-flowered; inflorescence paniculate. [Tribe AGROSTIDEAE.]
 Fruiting scales awned.
 Awns 3-cleft.
 Awns simple.
 Fruiting scales awnless.
2. Spikelets 2-several-flowered or 1-flowered in some genera of Chlorideae.
 *Lower scales elongated, often as long as the whole spikelet. [Tribe AVENEAE.]
 **Lower scales short.
 †Spikelets sessile or very nearly so, forming narrow spikes. [Tribe CHLORIDEAE.]
 ‡Spikelets with only 1 perfect flower.
 §Spikes racemose.
 §§Spikes digitate.
 α No empty scales above the flower.
 $\alpha\alpha$ One or more empty scales above the flower.
25. *Paspalum*.
 26. *Panicum*.
 27. *Ichnanthus*.
 28. *Lasiacis*.
 29. *Sacciolepis*.
 30. *Hymenachne*.
 31. *Isachne*.
 32. *Oplismenus*.
 33. *Echinochloa*.
 34. *Chaetochloa*.
 35. *Pennisetum*.
 36. *Cenchropsis*.
 37. *Cenchrus*.
 38. *Stenotaphrum*.
 39. *Olyra*.
 40. *Lithachne*.
 41. *Pharus*.
 42. *Oryza*.
 43. *Homalocenchrus*.
 44. *Aristida*.
 45. *Muhlenbergia*.
 46. *Sporobolus*.
 47. *Avena*.
 48. *Spartina*.
 49. *Capriola*.

- Perfect flower not stipitate.
 Flowering scale long-awned. 50. *Chloris*.
 Flowering scale awnless or merely tipped. 51. *Eustachys*.
 Perfect flower long-stipitate. 52. *Gymnopogon*.
 ††Spikelets with 2 or more perfect flowers.
 Spikes digitate.
 Rachis not produced beyond the spikelets. 53. *Eleusine*.
 Rachis produced beyond the spikelets. 54. *Dactyloctenium*.
 Spikes racemose or paniced.
 Spikes short, broad. 55. *Bouteloua*.
 Spikes long, slender.
 Spikes racemose. 56. *Leptochloa*.
 Spikes paniced. 57. *Diplachne*.
 ††Spikelets paniced, stalked. [Tribe FESTUCEAE.]
 †Flowering scale cleft into many awns. 58. *Pappophorum*.
 ††Flowering scale awnless or 1-awned.
 §Spikelets, at least the pistillate, long-hairy.
 Inflorescence monoecious; only the pistillate spikelets long-hairy. 59. *Gynerium*.
 Inflorescence not monoecious.
 Flowering scales long-hairy; rachilla glabrous. 60. *Arundo*.
 Flowering scales glabrous; rachilla long-hairy. 61. *Phragmites*.
 §§Spikelets not long-hairy; glabrous or ciliate.
 Flowering scales 3-nerved. 62. *Eragrostis*.
 Flowering scales many-nerved. 63. *Uniola*.
 II. Culms woody, climbing or erect. [Tribe BAMBOSEAE.]
 Culms climbing, vine-like. 64. *Arthrostyloidium*.
 Spikelets 2-several-flowered, racemose. 65. *Chusquea*.
 Spikelets 1-flowered, paniced. 66. *Bambos*.
 Culms erect.

1. **ZEA** L. Sp. Pl. 971. 1753.

Tall, erect, broad-leaved grasses, the staminate spikelets in terminal panicles, the pistillate aggregated, sessile, in several rows on a thick spongy rachis in the leaf-axils, enclosed in large foliaceous bracts. Staminate spikelets in pairs, 2-flowered; scales 4, the 2 outer membranous, the 2 inner hyaline, flowering. Pistillate spikelets with 4 short scales, the fourth one flowering; style filiform, greatly elongated, 2-toothed at the apex. Grain hard, naked except at base or rarely enclosed by the scales. [Greek, life, in allusion to its grain.] A monotypic genus.

1. **Zea Mays** L. Sp. Pl. 971. 1753.

Roots of thick fibers; culms 2-5 m. high, solid, 2-4 cm. thick. Leaf-blades 5-10 dm. long, 5-10 cm. wide, the tips usually drooping; staminate inflorescence 1-2.5 dm. long; fruiting pistillate inflorescence 1-3 dm. long, the grains white, yellow or black, flattened, various in shape and size.

Widely cultivated and occasionally spontaneous after cultivation. Native of South America. The species consists of numerous races developed under cultivation, none of them known in the wild state. INDIAN CORN. MAIS.

2. **COIX** L. Sp. Pl. 972. 1753.

Perennial, branching grasses with flat and broad leaf-blades, the spicate inflorescence monoecious. Pistillate spikelet and 1 or 2 sterile ones enclosed in a globose involucre which becomes bony and shining; scales 4, hyaline, the 2 outer empty; styles nearly distinct, filiform. Staminate spikelets in a short spike, exerted from the involucre; scales 4, the 2 outer ones empty, the 2 inner hyaline, one or both of them flowering. [Ancient Greek name, said to have been first

applied to some palm.] A few species, natives of the Old World tropics, the following typical.

1. **Coix Lachryma-Jobi** L. Sp. Pl. 972. 1753.

Culms 1.5 m. high or less, usually freely branching, glabrous. Leaf-blades 1-7 dm. long, 1.5-4 cm. wide, cordate-clasping at the base, the apex attenuate; inflorescence mostly axillary, 4-6 cm. long or longer; fruiting involucre globose or ovoid-globose, white or bluish, 6-12 mm. in diameter.

Waste wet and cultivated grounds, Porto Rico; Vieques; Tortola;—widely distributed in insular and continental tropical America; sometimes cultivated for its fruits, used as beads. Native of tropical Asia. **JOB'S TEARS.** **CAMANDULAS.**

3. **IMPERATA** Cirillo, Pl. Rar. Neap. 2: 26. 1792.

Perennial grasses with elongated leaves, the spikelets in dense terminal spike-like, silvery-hairy panicles. Spikelets 1-flowered, rarely 2-flowered, unequally pedicellate in pairs; scales 4, thin, hyaline, awnless, the 2 outer ones empty, pilose, the third glabrous, usually empty, the fourth glabrous, subtending a perfect flower and its 2-nerved palet. Stamens 1 or 2. Styles distinct, stigmas plumose. [Commemorates Ferrante Imperate, Italian naturalist of the sixteenth century.] About 5 species of tropical distribution. Type species: *Lagurus cylindricus* L.

1. **Imperata contracta** (H.B.K.) Hitchc. Rep. Mo. Bot. Gard. 4: 146. 1893.

Saccharum contractum H.B.K. Nov. Gen. 1: 182. 1816.

Anatherum portoricense Spreng. Syst. 1: 290. 1825.

Imperata caudata Trin. Mem. Acad. St. Petersburg. VI. 2: 331. 1832.

Culms rather slender, hollow, smooth, up to 1 m. high. Leaf-blades 4-6 dm. long, 6-10 mm. wide, hairy on the upper side near the base, long-attenuate, narrowed at the base; sheaths glabrous, or the lower pubescent; panicle narrow, 2-4 dm. long; spikelets long-hairy, about 3 mm. long.

Banks and hillsides, Porto Rico, ascending to 1000 m. on Monte Gregorio;—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; Dominica; Tobago; Trinidad; Mexico to northern South America. **GUAYANILLA.**

4. **SACCHARUM** L. Sp. Pl. 54. 1753.

A tall annual or perennial grass with flat and broad leaf-blades, the spikelets in a large terminal panicle of silky racemes, paired, one spikelet sessile, the other stalked, both 1-flowered, the flowers perfect, the axis of the racemes articulated. Scales 4, the 3 outer ones empty, the fourth one shorter than the others, flowering. Stamens 3. Styles distinct; stigmas plumose. [Ancient name of the Sugar Cane.] A monotypic genus.

1. **Saccharum officinarum** L. Sp. Pl. 54. 1753.

Culms stout, erect, 1.5-5 m. tall, glabrous. Leaf-sheaths glabrous or puberulent, the blades up to 1 m. long and 6 cm. wide, rough-margined; panicle 4-6 dm. long, the numerous slender racemes erect-ascending, 5-12 cm. long; spikelets narrow, about 3 mm. long, each with a tuft of long white hairs at the base.

Widely cultivated in many races and sometimes spontaneous after cultivation, the most important economic plant in Porto Rico; Vieques; St. Croix;—cultivated in tropical and warm temperate regions of both the Old World and the New. Probably native of southern Asia. **CANE.** **SUGAR CANE.** **CAÑA.**

5. **ERIOCHRYSIS** Beauv. Agrost. 8, 162. 1812.

Erect, perennial grasses, the leaf-blades flat, the inflorescence a silky, terminal, dense, spikelike panicle of short, crowded racemes. Spikelets 1-flowered, the pistillate ones short-stalked, the perfect ones sessile; scales 4, awnless, the 3 outer ones empty. Styles distinct; stigmas plumose. Grain oblong. [Greek, golden wool.] A few species, natives of tropical America and Africa, the following typical.

1. **Eriochrysis cayennensis** Beauv. Agrost. 8. 1812.

Saccharum cayennense Benth. Jour. Linn. Soc. 19: 66. 1881.

Culms stiff, smooth, 2 m. tall or less. Leaves 8–20 cm. long, or the upper ones shorter, 6–15 mm. wide, the blades densely pubescent on both sides, the sheaths pubescent, at least above; inflorescence 1–2 dm. long, usually interrupted, densely brown-velvety, 1–3 cm. thick; spikelets oblong, enveloped by the silky brown hairs, the sessile ones 2–2.5 mm. long, the stalked ones a little smaller.

Hillsides near San Juan, Bayamon and Maricao:—Hispaniola; Martinique; Trinidad; continental tropical America.

6. **RYTILIX** Raf. in Seringe, Bull. Bot. 1: 219. 1830.

Annual, branched grasses, with flat leaf-blades and small spikelets in terminal and axillary spike-like racemes. Spikelets borne in pairs in depressions of the rachis, 1-flowered, the sterile one short-stalked, larger than the perfect, sessile one. Scales 4, awnless, the first one of the perfect spikelet globose, pitted, the second concave, 1-nerved, the third shorter than the second, the fourth flowering, hyaline. Styles distinct. Stigmas plumose. First and second scales of the sterile spikelet 5–7-nerved, the third 2-nerved, the fourth nerveless or 1-nerved. [Derivation not cited.] A monotypic genus.

1. **Rytilix granularis** (L.) Skeels, Bull. U. S. Dept. Agric. 282: 20. 1913.

Cenchrus granularis L. Mant. 575. 1771.

Manisuris granularis Sw. Prodr. 25. 1788.

Hackelochloa granularis Kuntze, Rev. Gen. Pl. 776. 1891.

Culms freely branching, rather weak, 2–10 dm. long. Leaves papillose-hirsute, the blades 5–15 cm. long, 3–15 mm. wide, ciliate; racemes 1–2.5 cm. long; sessile spikelets about 1 mm. long, the stalked ones about 2 mm. long.

Banks, roadsides and fields at lower and middle elevations, Porto Rico:—southern United States; Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; St. Vincent; continental tropical America and Old World tropics.

7. **DIECTOMIS** H. & B.; Beauv. Agrost. 132, 150, 160. 1812.

Perennial grasses, with flat or folded leaf-blades, the spikelets in pairs in flattened spike-like racemes, one sessile, the other stalked. Internodes of the rachis with toothed appendages. First scale of the sessile spikelet 2-keeled; second scale awned; third scale hyaline; fourth scale membranous, 2-toothed, long-awned, the palea subtending a perfect flower. Stalked spikelet broad, flowerless, concealing the sessile one, its first scale awned. [Greek, two sterile scales.] A few species of tropical America, the following typical.

1. **Diectomis fastigiata** (Sw.) Beauv. Agrost. 160. 1812.

Andropogon fastigiatum Sw. Prodr. 26. 1788.

Culms usually branched, slender, glabrous, 1 m. high or less. Leaf-sheaths keeled; ligule broad, 5–10 mm. long; blades elongated, 1–4 mm. wide, glabrous, or ciliate at the base, scabrate; racemes 4–8 cm. long, the internodes ciliate; sessile spikelet 4–5 mm. long, the first scale pilose above, the awn of the second scale elongated, that of the fourth scale about 4 mm. long; stalked spikelet larger than the sessile one.

Fields and banks at lower elevations, Porto Rico;—Jamaica; Cuba; Hispaniola; Grenada; continental tropical America.

8. **SCHIZACHYRIUM** Nees; Agrost. Bras. 331. 1829.

Annual or perennial grasses, the spikelets in a spike-like raceme, terminating the culm or its branches. Rachis articulated, the internodes cup-shaped or appendaged, the basal callus barbed. Spikelets in pairs at each node of the rachis, one sessile, the other stalked, the sessile one dorsally compressed, 1-flowered, the flower perfect; first scale 2-keeled with infolded margins, the second awnless or bristle-tipped, the third 2-nerved or nerveless, the fourth usually 2-cleft, usually bearing a bent awn. Stalked spikelet usually flowerless. Stamens mostly 3. Styles distinct; stigmas plumose. [Greek, cleft-chaff.] Some 40 species, or more, of tropical and subtropical America. Type species: *Andropogon brevifolius* Sw.

Annual.

Perennials.

Rachis flexuous.

Rachis straight.

First scale of the sessile spikelet villous.

Scales glabrous or nearly so.

1. *S. brevifolium*.

2. *S. gracile*.

3. *S. domingense*.

4. *S. semiberbe*.

1. **Schizachyrium brevifolium** (Sw.) Nees; Kunth, Enum. 1: 488. 1833.

Andropogon brevifolius Sw. Prodr. 26. 1788.

Andropogon obtusifolius Poir. in Lam. Encycl. Suppl. 1: 538. 1810.

Annual, usually much-branched, spreading, glabrous, the culms decumbent, slender, flattened, 3–5 dm. long. Leaf-sheaths compressed, the blades flat, those of the main culm obtuse, 3–5 cm. long, 3–5 mm. wide, those of the branches much narrower; raceme very slender, filiform-peduncled, 1.5–3 cm. long; sessile spikelet about 4 mm. long, its fourth scale with a filiform awn 7–15 mm. long; stalked spikelet usually reduced to a single scale 1–1.5 mm. long, bearing an awn 4–5 mm. long.

Banks and meadows at lower and middle elevations, Porto Rico;—Jamaica; Cuba; Hispaniola (?); Martinique; Dominica; St. Vincent; Trinidad; continental tropical America and Old World tropics. SERILLO DULCE.

2. **Schizachyrium gracile** (Spreng.) Nash in Small, Fl. SE. U. S. 60. 1903.

Andropogon gracilis Spreng. Syst. 1: 284. 1825.

Andropogon juncifolius Desv.; Hamilt. Prodr. 9. 1825.

Perennial, tufted, glabrous, except the inflorescence; culms slender, branched, 2–6 dm. high. Sheaths striate; leaf-blades 2 dm. long or less, terete, less than 1 mm. in diameter; raceme long-stalked, 3–5 cm. long, the rachis clothed with long silky hairs; sessile spikelet 5–6 mm. long, the first scale chartaceous with hispidulous keels, the second scale acute, the fourth 2-cleft, bearing an awn 13–20 mm. long; stalked spikelet of one short-awned scale 1–2.5 mm. long.

Hillsides, Monte Mesa and near Arecibo, Porto Rico; St. Croix;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe.

3. **Schizachyrium domingense** (Spreng.) Nash, N. A. Fl. 17: 103. 1912.

Streptachne domingensis Spreng.; Schultes, Mant. 2: 188. 1824.

Schizachyrium hirtiflorum Nees, Agrost. Bras. 334. 1829.

Andropogon hirtiflorus Kunth, Rev. Gram. 2: 569. 1832.

Perennial; culms branched, glabrous, 12 dm. high or less. Leaves glabrous or sparingly pubescent or ciliate, the blades 1-2 dm. long, 3-5 mm. wide; raceme 4-12 cm. long; sessile spikelet lanceolate, about 8 mm. long, its first scale villous, or hirsute, entire or bifid at the apex, the fourth scale deeply cleft, bearing a geniculate awn 12-20 mm. long; stalked spikelet 3-5 mm. long, short-awned.

Rio Maricao (*Chase 6202*):—Florida; Jamaica; Cuba, Hispaniola.

4. **Schizachyrium semiberbe** Nees, Agrost. Bras. 336. 1829.

Andropogon semiberbis Kunth, Enum. 1: 489. 1833.

Perennial; culms glabrous, branched, erect, 6-13 dm. high; leaves glabrous; sheaths compressed, keeled; blades 1-3 dm. long, 2-5 mm. wide; raceme narrow, 5-8 cm. long, the internodes of the rachis as long as the sessile spikelets or shorter, glabrous or nearly so; sessile spikelets 5-7 mm. long, the first scale glabrous or with a few short hairs, its infolded margins touching, the third and fourth scales, ciliate, the fourth 2-cleft nearly to the base, its awn 12-15 mm. long; stalked spikelet of one hispidulous scale about 3 mm. long, with an awn about as long.

Banks and field at lower elevations, Porto Rico:—Florida; Bahamas; Jamaica; Cuba; Trinidad; continental tropical America.

9. **ANDROPOGON** L. Sp. Pl. 1045. 1753.

Perennial grasses with usually long narrow leaves, and terminal and axillary racemes. Spikelets in pairs at each node of the jointed hairy rachis, one sessile, and perfect, the other with a pedicel and either staminate, empty or reduced to a scale, or none. Perfect spikelet consisting of 4 scales, the outer 2 coriaceous, the second keeled and acute, the two inner hyaline, the fourth awned or awnless and subtending a palet and perfect flower. Stamens 1-3. Grain free. [Greek, in allusion to the bearded rachis.] About 100 species, widely distributed in tropical and temperate regions, known as BEARD-GRASS and MOTOJILLO. Type species: *Andropogon virginicus* L.

Spikelets awned.

1. *A. glomeratus*.

Spikelets awnless.

Inflorescence corymbose, dense.

2. *A. bicornis*.

Inflorescence not dense, paniculate.

Racemes long-pilose.

3. *A. leucostachys*.

Racemes glabrous.

4. *A. virgatus*.

1. **Andropogon glomeratus** (Walt.) B. S. P. Prel. Cat. N. Y. 67. 1888.

Cinna glomerata Walt. Fl. Car. 59. 1788.

Andropogon macrourus Michx. Fl. Bor. Am. 1: 56. 1803.

Andropogon tenuispathus Nash, N. A. Fl. 17: 113. 1912.

Culms 1.5 dm. high or less, much branched, the ultimate flowering branches forming oblong corymbiform clusters, the nodes of the secondary branches densely barbed. Sheaths keeled; leaf-blades 4 dm. long or less, 3-7 mm. wide; spathes 2.5-3 cm. long, glabrous; racemes in pairs, 1-2 cm. long; sessile spikelet 3-4 mm. long, the awn 10-15 mm. long; pedicellate spikelet a rudimentary scale, or wanting.

Moist grounds at lower and middle elevations, Porto Rico; St. Thomas? (ex Hackel); eastern and southeastern United States; Jamaica; Bahamas; Cuba; Hispaniola; St. Kitts to Martinique; continental tropical America north to Mexico.

2. **Andropogon bicornis** L. Sp. Pl. 1046. 1753.

Culms rather stout, stiff, glabrous, 8–15 dm. high, much branched above, the branches erect-ascending, the inflorescence dense, corymbiform. Leaf-sheaths glabrous, the blades elongated, 3–4 mm. wide, those of the ultimate branches spathe-like, small and narrow; racemes very numerous, slender, long-hairy, 3–4 cm. long; scales all awnless. [? *A. alopecuroides* of Krebs.]

Banks and fields at lower and middle altitudes in Porto Rico, ascending to 800 m.; St. Thomas; St. Jan; Tortola:—Cuba to Trinidad; Jamaica; continental tropical America.

3. **Andropogon leucostachys** H.B.K. Nov. Gen. 1: 187. 1816.

Culms usually clustered, slender, erect, 5–8 dm. high, glabrous, branched above. Leaves glabrous; blades 1–3 dm. long, 1.5–5 mm. wide; racemes in distant clusters of 2 to 5, 3–6 cm. long, the axis with long white hairs; sessile spikelet 2.5–4 mm. long, awnless, the fourth scale muticous.

Banks and fields at lower and middle altitudes in Porto Rico, ascending to 800 m.; St. Thomas:—Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America.

4. **Andropogon virgatus** Desv.; Hamilt. Prodr. 9. 1825.

Hypogynium spathiflorum Nees, Agrost. Bras. 366. 1829.

Andropogon spathiflorus Kunth, Enum. 1: 496. 1833.

Perennial; culms clustered, usually much-branched above. Leaf-sheaths compressed, the blades 4 dm. long or less, 1.5–2.5 mm. wide, glabrous, or ciliate at the base; racemes panicle, 6–13 mm. long, the rachis straight; sessile spikelet about 3 mm. long, narrowly lanceolate, its first scale keeled, nerveless, the second and third 1-nerved, the fourth 2-toothed, all awnless; stalked spikelet about as long as the sessile one.

Fields and banks at lower and middle altitudes, Porto Rico:—Cuba; Hispaniola; Trinidad; continental tropical America.

10. **DICHANTHIUM** Willemet in Usteri, Ann. 18: 11. 1796.

Mostly perennial grasses, with branched or simple culms, flat leaves, and subdigitate, spike-like racemes. Spikelets in pairs at the nodes of the jointed rachis, one sessile and mostly perfect, the other filiform-pedicelled, staminate or neutral, the two similar in shape and size. Perfect spikelet sessile, its scales chartaceous, the upper one passing into a slender awn. Stamens 3. Grain oblong. [Greek, referring to the paired spikelets.] About 8 species, natives of the Old World. Type species: *Dichanthium nodosum* Willemet.

1. **Dichanthium annulatum** (Forsk.) Stapf. in Prain. Fl. Brit. Ind. 9: 178. 1917.

Andropogon annulatus Forsk. Fl. Agypt.-Arab. 173. 1775.

Perennial; culms slender, tufted, 6–10 dm. long, glabrous, ascending, the nodes usually white-bearded. Leaves glabrous, narrow, 5 mm. wide or less; racemes few or several, rather flaccid, 3–6 cm. long, nearly erect, usually purplish; sessile spikelet about 4 mm. long, the awn 10–20 mm. long, almost filiform; lower scale of the pedicelled spikelet several-nerved.

Along a ditch, Aguirre (*Britton & Earle 6494*, March 11, 1922):—Cuba; British Guiana. A native of the Old World tropics.

11. **AMPHILOPHIS** Nash in Britton, Man. 71. 1901.

Perennial grasses with usually flat leaves and showy, often silvery-white, panicles, the axis short, making the panicle appear fan-like, or elongated with the branches more scattered. Racemes usually numerous, the internodes with mani-

festly thickened margins, the median portion thin and translucent, the pedicels of the same structure, the margins ciliate with usually long hairs. Sessile spikelets of 4 scales, the first one 2-keeled, the second 1-keeled, the third and fourth scales hyaline, the latter very narrow, stipe-like, somewhat thickened, gradually merging into a usually geniculate, contorted or spiral awn, or the awn rarely wanting. Stalked spikelets staminate and similar to the sessile, or sterile and smaller. Stamens 3. Styles distinct. Stigmas plumose. Grain free, enclosed in the scales. [Greek, with reference to the hairs surrounding the spikelets.] Thirty species or more, natives of temperate and tropical regions. Type species: *Andropogon Torreyanus* Steud.

Stalked spikelet much smaller than the sessile one.
Stalked and sessile spikelets about equal in size.

1. *A. saccharoides*.
2. *A. Ischaemum*.

1. **Amphilophis saccharoides** (Sw.) Nash, N. A. Fl. 17: 125. 1912.

Andropogon saccharoides Sw. Prodr. 26. 1788.

Culms erect, 4.5–10.5 dm. tall, the nodes naked or barbed. Sheaths more or less glaucous; blades 7.5–25 cm. long, glaucous; racemes numerous, 2.5–3.75 cm. long in a terminal long-exserted panicle 4–10 cm. long; outermost scale of sessile spikelet 3–4 mm. long, about equalling the terminal hairs of the rachis-joints, lanceolate, acute; awn 8–16 mm. long, spiral; pedicelled spikelet shorter than the sessile one, reduced to a 7-nerved scale.

Mountain sides, Monte Mesa and Monte Alegriño:—southwestern United States to Mexico and northern South America; Jamaica; Cuba; Hispaniola; Antigua, Martinique.

2. **Amphilophis Ischaemum** (L.) Nash, N. A. Fl. 17: 124. 1912.

Andropogon Ischaemum L. Sp. Pl. 1047. 1753.

Andropogon panormitanus Parl. Fl. Ital. 1: 140. 1848.

Culms erect, simple, or branched above, up to about 8 dm. high. Leaf-sheaths glabrous, the blades linear, 5–20 cm. long, 3–6 mm. wide, sometimes sparingly hairy near the base; racemes several, subflabellate, 4–8 cm. long; sessile spikelet 3–4 mm. long, its first scale 7–9-nerved, the second ciliate, the fourth bearing an awn 1–2 cm. long; stalked spikelet about the size of the sessile one.

Very abundant in fields and waste grounds, St. Croix, where it has become a pernicious weed:—Jamaica; Antigua to Trinidad; naturalized from the Old World. A species consisting of several races. [*Andropogon saccharoides* of Eggers, not of Swartz; *A. Wrightii* of Millspaugh.] SOUR GRASS.

12. **CYMBOPOGON** Spreng. Pug. 2: 14. 1815.

Large, perennial grasses, with flat leaf-blades, the spikelets in panicle racemes. Spikelets in pairs, one sessile, the other stalked, the racemes forked, bearing an awnless, staminate spikelet in the fork, the sessile spikelet of the lower pair or pairs differing from those above. [Greek, hollow-beard.] About 10 species, natives of the Old World tropics. Type species: *Andropogon Schoenanthus* L.

Sessile spikelets lanceolate to ovate-lanceolate, the back flat.
Sessile spikelets linear to linear-lanceolate, the back concave below.

1. *C. Nardus*.
2. *C. citratus*.

1. **Cymbopogon Nardus** (L.) Rendle, Cat. Welw. Afric. Pl. 2: 155. 1899.

Andropogon Nardus L. Sp. Pl. 1046. 1753.

Culms much branched, 1–2 m. tall, the aromatic leaves crowded near the base, the inflorescence decomposed, up to 8 dm. long. Leaves glabrous, glaucous,

6–10 dm. long, 1.5–2 cm. wide; spathes cymbiform, 1–2 cm. long; racemes 1–1.5 cm. long; sessile spikelet 4–5 mm. long, lanceolate to ovate-lanceolate, the back flat, the fourth scale 2-toothed.

Locally spontaneous after cultivation in Porto Rico, as in Florida, Jamaica, Martinique and Guadeloupe. Native of tropical Asia. CITRONELLA GRASS.

2. **Cymbopogon citratus** (DC.) Stapf, Kew. Bull. 1906: 357. 1906.

Andropogon citratus DC. Cat. Hort. Monsp. 78. 1813.

Andropogon ceriferus Hack. in Mart. Fl. Bras. 2³: 281. 1883.

Similar to the preceding species, and about as large, the nodes of the culm ceriferous, the branches of the inflorescence elongated and somewhat pendulous. Spathes lanceolate; racemes like those of *C. Nardus*, but the sessile spikelet linear to linear-lanceolate, acuminate, the back concave below.

Banks at lower elevations, Porto Rico, escaped from cultivation; Vieques; St. Thomas:—Florida; Cuba; Guadeloupe; Trinidad; South America. Original home unknown, and known only in cultivation or as an escape from cultivation. LEMON-GRASS.

13. **ANATHERUM** Beauv. Agrost. 128. 1812.

Tall erect grasses; the culms mostly simple, the leaf-blades narrow and flat, the narrow spikelets on whorled branches of large terminal panicles. Spikelets paired, one sessile, bearing a perfect flower, the other stalked, staminate. Scales 4. Sessile spikelet flattened laterally, its first scale coriaceous or chartaceous, the second awned or awnless, the third and fourth hyaline. Stalked spikelet usually awnless. Stamens 3. Stigmas plumose, much longer than the styles. [Greek, without awns.] A few species of the Old World tropics, the following typical.

1. **Anatherum zizanioides** (L.) H. & C. Contr. U. S. Nat. Herb. 18: 285. 1917.

Phalaris zizanioides L. Mant. 183. 1771.

Andropogon muricatus Retz. Obs. 3: 43. 1783.

Anatherum muricatum Beauv. Agrost. 150. 1812.

Andropogon zizanioides Urban, Symb. Ant. 4: 79. 1903.

Vetiveria zizanioides Nash in Small, Fl. SE. U. S. 67. 1903.

Perennial, with aromatic roots; culms 2–2.5 m. tall, glabrous, shining. Leaves glabrous, the blades up to 9 dm. long, 4–10 mm. wide; panicle narrow, 2–3 dm. long, its branches readily disarticulating from the nodes; sessile spikelet about 4 mm. long, the second scale with a muricate keel, the fourth awnless or short-awned; stalked spikelet as long as the sessile one or a little shorter.

Banks and roadsides, Porto Rico, escaped from cultivation:—widely cultivated and locally spontaneous in tropical and subtropical regions. Native of the Old World. KHUS-KHUS. PACIULI.

14. **HOLCUS** L. Sp. Pl. 1047. 1753.

Tall erect grasses, with broad and flat leaf-blades. Spikelets in large terminal panicles, in pairs or in 3's at the ends of its branches, one sessile and with a perfect flower, the other 1 or 2 stalked and staminate. Sessile spikelet with the 2 outer scales indurated, the third and fourth hyaline, the fourth awned or awnless. Stalked spikelet with the 2 outer scales firm-membranous. Stamens 3.

Styles distinct; stigmas plumose. [Greek, taken from Pliny]. About 10 species, of wide distribution. Type species: *Holcus Sorghum* L.

Perennial; panicle decompound.
Annual; panicle usually dense.

1. *H. halepensis*.
2. *H. Sorghum*.

1. ***Holcus halepensis*** L. Sp. Pl. 1047. 1753.

Andropogon halepensis Brot. Fl. Lusit. 1: 89. 1804.
Sorghum halepense Pers. Syn. 1: 101. 1805.
Andropogon cernuus Kunth, Enum. 1: 501. 1833.

Perennial by long rootstocks; culms smooth, erect, 2 m. high or less. Leaf-blades 4–6 dm. long, 1–3 cm. wide; panicle decompound, open, up to 6 dm. long, its branches ascending; sessile spikelets about 4 mm. long, the outer scales densely appressed-pubescent; first scale 3-toothed at the apex; fourth scale bearing a bent awn about 12 mm. long; stalked spikelet about 6 mm. long, its 2 outer scales pubescent.

Waste grounds near Rio Piedras;—widely distributed in tropical and warm-temperate America by cultivation for fodder. Native of the Old World. JOHNSON GRASS.

2. ***Holcus Sorghum*** L. Sp. Pl. 1047. 1753.

Andropogon Sorghum Brot. Fl. Lusit. 1: 88. 1804.
Sorghum vulgare Pers. Syn. 1: 101. 1805.
Andropogon bicolor Roxb. Hort. Beng. 21. 1814.
Andropogon Sorghum sudanensis Piper, Proc. Biol. Soc. Wash. 28: 33. 1915.

Annual; culms tall, stout, up to 4 m. high. Leaf-blades 2–5 cm. wide, elongated; panicle dense or decompound, its branches commonly nearly erect; stalked spikelet often without flowers; sessile spikelets similar to those of the preceding species, from which it is supposed to have been derived.

Locally spontaneous after cultivation in Porto Rico; St. Croix; St. Thomas;—widely cultivated in temperate and tropical regions in several races. Native of the Old World. SORGHUM. GUINEA CORN.

15. **SORGHASTRUM** Nash in Britton, Man. 71. 1901.

Generally tall perennial grasses, with long, narrow, flat leaves and terminal panicles. Spikelets in pairs, or 3's at the end of the branches, one sessile and perfect, the lateral pedicelled, empty, or reduced to the pedicel only. Perfect spikelet consisting of 4 scales, the two outer indurated and shining, the inner hyaline, the fourth awned and subtending a palet and perfect flower, or the palet sometimes wanting. Stamens 3. Styles distinct. Stigmas plumose. Grain free. [Named with reference to the resemblance of these grasses to sorghum.] About 15 species, in temperate and tropical regions. Type species: *Andropogon avenaceus* Michx.

1. ***Sorghastrum parviflorum*** (Desv.) H. & C. Contr. U. S. Nat. Herb. 18: 287. 1917.

Sorghum parviflorum Desv.; Hamilt. Prodr. 12. 1825.
Andropogon setosus Griseb. Cat. Pl. Cub. 235. 1866.
Sorghastrum setosum Hitchc. Contr. U. S. Nat. Herb. 12: 195. 1909.
Sorghastrum agrostoides Hitchc. Bot. Gaz. 51: 300. 1911.

Culms smooth, erect, often clustered, up to 1 m. high or higher. Leaf-blades flat or the margins involute in drying, elongated, 4–7 mm. wide; panicle narrow, 1–3 dm. long, its branches nearly filiform; spikelets 3.5–4 mm. long, hirsute, yellowish-brown, the awn 1–4 mm. long.

Open sandy soil, northeastern districts of Porto Rico;—Jamaica; Cuba; Hispaniola; continental tropical America.

16. **HETEROPOGON** Pers. Syn. 2: 533. 1807.

Annual or perennial grasses, with narrow leaf-blades, the 1-flowered spikelets in spike-like racemes borne singly at the ends of the branches of the inflorescence. Spikelets in pairs, one sessile, flowerless or with a staminate flower in the lower pair, and with a pistillate or perfect flower in the pairs above; the other spikelet stalked, bearing a staminate flower or flowerless. Sessile spikelet of 4 scales, with a hairy-pointed callus, the first scale convolute, awnless; the second keeled, the third hyaline, the fourth flowering and bearing a long twisted awn; stalked spikelet awnless. Stamens 3. Styles distinct; stigmas plumose. [Greek, variously bearded.] About 8 species, natives of warm-temperate and tropical regions. Type species: *Andropogon Allionii* DC.

1. **Heteropogon contortus** (L.) Beauv.; R. & S. Syst. 2: 836. 1817.

Andropogon contortus L. Sp. Pl. 1045. 1753.

Perennial; culms 2-8 dm. high, branched above. Leaves smooth, the blades 1-2 dm. long, 3-7 mm. wide; racemes 4-7 cm. long, the internodes between the upper spikelets densely pubescent with long brown hairs; callus of the sessile spikelets brownish-barbed, about 3 mm. long, the spikelet about 8 mm. long, the awn 4-12 cm. long; stalked spikelet about 10 mm. long, its first scale papillose-hispid with long hairs above and near the margins.

Krumbay, St. Thomas (ex Eggers); Virgin Gorda;—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; continental tropical America and Old World tropics. TWISTED GRASS.

17. **ANTHEPHORA** Schreb. Besch. Gras. 2: 105. 1810.

Tufted grasses, the culms often branched, erect or prostrate, the leaves mostly flat, the 1-flowered spikelets in deciduous clusters of 3 or 4, forming elongated terminal, slender spikes. Empty scales of the spikelets rigid, the first one indurated, large, involucre-like, the others acute or short-awned; upper and inner scales thin, the innermost enclosing a thin palet and a perfect flower, the stamens 3, the styles united at the base, the stigmas plumose. [Greek, flower-bearing.] Five known species, of tropical distribution, the following typical

1. **Anthephora hermaphrodita** (L.) Kuntze, Rev. Gen. Pl. 759. 1891.

Tripsacum hermaphroditum L. Syst. ed. 10, 1261. 1759.

Cenchrus laevigatus Trin. Fund. Agrost. 172. 1820.

Annual; culms 3-10 dm. long, rooting and branching at the lower nodes. Leaves flat, 7-20 cm. long, 4-10 mm. wide, glabrous or hirsute, acuminate; spikes 2-12 cm. long, continuous and dense, or interrupted below, about 4 mm. thick, the slender rachis flexuous; cluster of spikelets about 7 mm. long; lower scales ovate to elliptic, acute to acuminate, glabrous or hispidulous.

Fields, sandy and stony soil, northern districts of Porto Rico; St. Croix; St. Thomas; Tortola; Virgin Gorda;—West Indies; continental tropical America.

18. **NAZIA** Adans. Fam. Pl. 2: 31, 581. 1763.

Annual grasses, diffusely branched, with flat leaves and 1-flowered deciduous spikelets, either solitary or in clusters of 3-5 in a terminal spike. Scales of spikelet 2 or 3, the outermost small or wanting, the second rigid and covered with

hooked prickles, the third membranous, subtending a pale and perfect flower. [Name unexplained.] Two species, of tropical and temperate regions. Type species: *Cenchrus racemosus* L.

1. **Nazia aliena** (Spreng.) Scribn. Bull. U. S. Dep. Agr. Agrost. **17**: 28. 1899.

Lappago aliena Spreng. Neuo Entdeck. **3**: 15. 1822.

Tufted, 1-3 dm. high, the culms often rooting at the lower nodes, slender, glabrous. Sheaths glabrous; leaf-blades 2-8 cm. long, 4 mm. wide or less, their margins ciliate. Inflorescence 4-10 cm. long; spikelets 2-3 mm. long; the second scale bearing prickles 0.5 mm. long or less, the prickles with swollen opaque bases.

Fields, rocks and waste grounds, especially near the southern coast, Porto Rico; Culebrita; St. Thomas; St. Jan; St. Croix;—southwestern United States; Bahamas; Jamaica; Cuba; Hispaniola; St. Barts; St. Eustatius; St. Kitts; Antigua; Trinidad; Margarita; Curacao; continental tropical America. [Apparently recorded by Hackel as *Tragus racemosus* from near Coamo; *Lappago racemosa* of Krebs.] PRICKLE-GRASS.

19. **ARUNDINELLA** Raddi, Agrost. Bras. 36 1823.

Erect, often tall grasses, with flat leaf-blades and small spikelets, jointed below the outer scales, in a large terminal panicle. Spikelets 1-2-flowered, when 2-flowered the lower flower staminate. Scales 4, the first awnless, the second awned or acuminate, the third mucous, the fourth membranous, awned or awnless. Stamens 3. Styles distinct; stigmas plumose. [Diminutive of *Arundo*.] About 30 species, natives of warm temperate and tropical regions. Type species: *Arundinella brasiliensis* Raddi.

1. **Arundinella confinis** (Schultes) H. & C. Contr. U. S. Nat. Herb. **18**: 290. 1917.

Piptatherum confine Schultes, Mant. **2**: 184. 1824.

Arundinella martinicensis Trin. Gram. Pan. 62. 1826.

Culms rather stout, 1.5 m. tall or less, glabrous. Leaf-sheaths more or less hispid above, the blades 2-4 dm. long, 1-2 cm. wide, usually hispid; panicle dense, 2-4 dm. long, its nearly bifurcated branches erect-ascending; spikelets about 4 mm. long, the fourth scale tipped with an awn about 2 mm. long. [Recorded by Hackel as *A. hispida*.]

Banks, hillsides and cliffs from lower to higher elevations in moist districts of Porto Rico;—Jamaica; Cuba Hispaniola; Guadeloupe to Trinidad; continental tropical America.

20. **LEPTOCORYPHIUM** Nees, Agrost. Bras. 83. 1829.

Erect, perennial grasses, with narrow leaves and small, silky, panicle spikelets, jointed below the scales. Spikelets lanceolate, 1-flowered. Scales 3, the 2 outer ones empty, long-hairy, the fruiting one minutely papillose, cartilaginous, its summit hyaline, lacerate, open. Stamens 3. Styles distinct; stigmas plumose. [Greek, thin apex, referring to the hyaline apex of the fruiting scale.] A few species of tropical America, the following typical.

1. **Leptocoryphium lanatum** (H.B.K.) Nees, Agrost. Bras. 84. 1829.

Paspalum lanatum H.B.K. Nov. Gen. **1**: 94. 1815.

Milium lanatum L. & S. Syst. **2**: 322. 1817.

Culms slender, smooth, 1 m. high or less, solitary or clustered, the old leaf-sheaths persistent. Leaves glabrous, or nearly so, 2-3 dm. long, 2-4 mm. wide;

panicle terminal, narrow, 1-2 dm. long, with short, nearly filiform, ascending branches; spikelets filiform-stalked, 4-5 mm. long, the fruiting scale chestnut-brown.

Red clay slopes, Monte Mesa, Mayaguez:—Cuba; Trinidad; continental tropical America.

21. **VALOTA** Adans. Fam. Pl. 2: 495. 1765.

Perennial grasses, with flat leaves and terminal pubescent panicles. Spikelets lanceolate, acute or acuminate; scales 4, the 3 outer ones membranous, empty, the first minute or rudimentary, the second silky-pilose and ciliate, the fourth one shorter, glabrous, shining, chartaceous. [Perhaps in honor of P. Vallot.] Several species, of warm temperate and tropical America, the first following one typical.

Leaves elongated; racemes many.
Leaves short; racemes few.

1. *V. insularis*.
2. *V. Eggersii*.

1. **Valota insularis** (L.) Chase, Proc. Biol. Soc. Wash. 19: 188. 1906.

Andropogon insulare L. Syst. Nat. ed. 10, 1304. 1759.
Panicum leucophaeum H.B.K. Nov. Gen. 1: 97. 1815.
Panicum insulare Meyer, Prim. Fl. Esseq. 60. 1818.
Trichachne insularis Nees, Agrost. Bras. 86. 1829.

Culms erect, slender, 1-1.6 m. high, clustered. Leaves 3 dm. long or less, 1-2 cm. wide, acuminate, glabrous or their sheaths pubescent; panicle narrow, often 3 dm. long, little, if any more than 3 cm. thick; racemes many; spikelets 4-6 mm. long, acuminate; second and third scale 3-nerved, long-hairy; fruiting scale chestnut-brown.

Banks and hillsides at lower and middle elevations, Porto Rico, mostly in dry districts; Desecheo; Mona; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola:—southern United States; Bermuda; West Indies and continental tropical America. SILKY-GRASS.

2. **Valota Eggersii** (Hack.) H. & C. Contr. U. S. Nat. Herb. 18: 292. 1917.

Panicum Eggersii Hack. Oest. Bot. Zeits. 51: 292. 1901.

Culms erect, very slender, 2-4 dm. high. Leaves short, lanceolate, 2.5-4 cm. long, 2-4 mm. wide, the sheaths puberulent; inflorescence of 2-4 very slender racemes; racemes erect, 2-5 cm. long; spikelets about 4 mm. long.

Banks, St. Thomas; Virgin Gorda. Endemic.

22. **SYNTHERISMA** Walt. Fl. Car. 76. 1788.

Mostly annual grasses, with flat leaves and spikelets borne in pairs or sometimes in 3's, in second racemes which are digitate or approximate at the summit of the culm. Spikelets often purplish. Scales of the spikelet 4, sometimes 3 by the suppression of the lowest one; the fourth or innermost scale chartaceous, subtending a pale of similar texture and a perfect flower. Stamens 3. Stigmas plumose. [Greek, crop-making, in allusion to its abundance.] Species about 20, widely distributed in temperate and tropical regions, known as CRAB-GRASS and FINGER-GRASS. Type species: *Syntherisma praecox* Walt.

Rachis of the raceme winged, appearing flat.
Spikelets glabrous or puberulent.
Spikelets about 3 mm. long.
Spikelets not over 2 mm. long.
Spikelets pubescent.

1. *S. sanguinalis*.
2. *S. chinensis*.
3. *S. Ischaemum*.

Rachis of the raceme wingless.

Rachis with long scattered hairs.

Rachis without long hairs.

Hairs of the spikelet long, forming a brush-like tip.

Hairs of the spikelet short.

4. *S. digitata*.

5. *S. argillacea*.

6. *S. filiformis*.

1. **Syntherisma sanguinalis** (L.) Dulac, Fl. Haut. Pyr. 77. 1867.

Panicum sanguinale L. Sp. Pl. 57. 1753.

Digitaria sanguinalis Scop. Fl. Carn. ed. 2, 1: 52. 1772.

Digitaria marginata Link, Enum. Hort. Berol. 1: 102. 1821.

Digitaria fimbriata Link, Hort. Berol. 1: 226. 1827.

Panicum fimbriatum Kunth, Rev. 33. 1829.

Syntherisma marginatum Nash, N. A. Fl. 17: 154. 1912.

Culms 8 dm. long or less, finally branched, prostrate at the base and rooting at the lower nodes. Lower leaf sheaths densely papillose-hirsute; blades 2-8 cm. long, 5-10 mm. wide, glabrous or more or less pubescent; racemes 2-9, 2-12 cm. long, in pairs or whorls; spikelets 3-3.5 mm. long, about 0.8 mm. wide, lanceolate, very acute, in pairs; first scale small, glabrous, the second one 3-nerved, the third slightly exceeding the flowering scale, 7-nerved, the fourth one lanceolate, very acute, yellowish white at maturity.

Waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—widely distributed in temperate and tropical regions.

2. **Syntherisma chinensis** (Nees) Hitchc. Contr. U. S. Nat. Herb. 22: 468. 1922.

Paspalum chinense Nees in H. & A. Bot. Beechey Voy. 231. 1841.

Syntherisma Helli Nash, Minn. Bot. Stud. 1: 798. 1897.

Culms slender, glabrous, erect or reclining, 5 dm. long or less. Leaves glabrous, the blades 1.5-3 dm. long, 4-6 mm. wide; racemes 3-5 in a terminal whorl, rarely fewer, sometimes with 1 or 2 additional ones below, 6-10 cm. long; rachis flattened, narrowly winged; spikelets in 2's or 3's, about 1.5 mm. long; first scale wanting; second and third scales about equal, 3-5-nerved, appressed-pubescent; fruiting scale brown, acute.

Fields and waste grounds, Porto Rico:—Bermuda; Jamaica; Trinidad. Naturalized from the Old World tropics. Formerly confused with *S. longiflora* (Retz) Sheels.

3. **Syntherisma Ischaemum** (Schreb.) Nash, N. A. Fl. 17: 151. 1912.

Panicum Ischaemum Schreb.; Schweig. Spec. Fl. Erlang. 16. 1804.

Culms slender, glabrous, branched at the base, becoming prostrate, 2-5 dm. long, forming mats. Leaves glabrous, the sheaths compressed, the blades 6-15 cm. long, 2.5-6 mm. wide; racemes 2-5, widely spreading, 2-8 cm. long; rachis flattened, narrowly winged; spikelets elliptic, about 2 mm. long, the first scale rudimentary or wanting, the second and third pubescent, the fruiting scale chestnut-brown.

Waste grounds, St. Croix:—eastern United States. Native of Europe.

4. **Syntherisma digitata** (Sw.) Hitchc. Contr. U. S. Nat. Herb. 12: 142. 1908.

Milium digitatum Sw. Prodr. 24. 1788.

Digitaria horizontalis Willd. Enum. 92. 1809.

Panicum horizontale Meyer, Prim. Fl. Esseq. 54. 1818.

Syntherisma setosa Nash, Bull. Torrey Club 25: 300. 1898.

Culms 4-10 dm. long, branched, tufted, at length decumbent below and rooting at the lower nodes. Leaves more or less densely hirsute, 2-12 cm. long, 2-7 mm. wide; racemes several, 3-14 cm. long, whorled or alternate or approximate



in pairs, widely spreading; rachis very narrow; spikelets in pairs, about 2.5 mm. long, lanceolate, acuminate; first scale minute, glabrous; second scale 3-nerved, appressed-pubescent; third scale 7-nerved, also appressed-pubescent; fruiting scale nearly 2 mm. long, shorter than the third, elliptic, greenish when mature.

Plains, waste and cultivated grounds, Porto Rico; Icaicos; Mona; Vieques; Culebra; St. Croix; St. Thomas; Tortola.—Florida; West Indies; continental tropical America and Old World tropics.

5. **Syntherisma argillacea** H. & C. Contr. U. S. Nat. Herb. 18: 296. 1917.

Perennial; culms usually tufted, ascending from a decumbent base, glabrous, simple, or branched below, 6 dm. long or less, the nodes loosely pilose. Leaves pilose or scabrous, the blades 3–8 cm. long, 3–5 mm. wide; racemes 1 or several, up to 8 cm. long, the rachis very slender, wingless; spikelets about 2 mm. long, clothed with appressed hairs forming a brush-like tip, the fourth scale brown.

Monte Alegreillo near Maricao, at 800 meters elevation, and on Monte Mesa;—Cuba.

6. **Syntherisma filiformis** (L.) Nash, Bull. Torrey Club 22: 420. 1895.

Panicum filiforme L. Sp. Pl. 57. 1753.

Milium panicum Sw. Prodr. 24. 1788.

Digitaria filiformis Muhl. Gram. 131. 1817.

Syntherisma panicum Nash, N. A. Fl. 17: 152. 1912.

Culms 1.5–7 dm. tall. Sheaths, at least the lower ones, hirsute; blades 3–20 cm. long, 1–4 mm. wide; racemes 2–5, 2–10 cm. long, erect or ascending; spikelets about 1.8 mm. long, 0.75 mm. wide, elliptic, short-hairy, acute, in pairs, the first scale wanting, the second 3-nerved, the third 7-nerved, the fourth scale deep chestnut-brown at maturity.

Sandy soil, northern districts of Porto Rico; Cowell Hill, St. Thomas (ex Eggers);—eastern United States; Bahamas; Jamaica; Cuba; Hispaniola; Mexico.

23. **ERIOCHLOA** H.B.K. Nov. Gen. 1: 94. 1815.

Perennial grasses, with flat leaf-blades. Spikelets 1-flowered, in secund spike-like racemes, in 2 rows along a flattened rachis, jointed below a basal annular callus, acute or acuminate. Scales 3, the 2 outer membranous, empty, the third indurated, shining, awn-tipped, flowering, the flower perfect. Stamens 3. Styles distinct; stigmas plumose. [Greek, woolly grass.] About 10 species, natives of warm and tropical regions. Type species: *Eriochloa distachya* H.B.K.

Spikelets long-acuminate.
Spikelets acute.

1. *E. punctata*.
2. *E. subglabra*.

1. **Eriochloa punctata** (L.) Desv.; Hamilt. Prodr. 5. 1825.

Milium punctatum L. Syst. ed. 10, 872. 1759.

Monachne punctata Nash, Bull. Torrey Club 30: 374. 1903.

Culms usually clustered, branched, 2–8 dm. high, the nodes puberulent, the leaves glabrous or puberulent. Blades 3 dm. long or less, 3–10 mm. wide; inflorescence usually long-stalked; racemes erect or ascending, 1.5–4 cm. long, the rachis short-hairy; spikelets 4–5 mm. long, lanceolate, long-acuminate, the 2 outer scales with long appressed hairs, the third scale short-awned, transversely rugose.

Banks, roadsides, waste and cultivated grounds at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; Tortola;—southern United States; Jamaica; Cuba to Trinidad; continental tropical America and Old World tropics.

2. **Eriochloa subglabra** (Nash) Hitchc. Contr. U. S. Nat. Herb. 12: 208. 1909.*Monachne subglabra* Nash, Bull. Torrey Club 30: 374. 1903.*Eriochloa punctata subglabra* Urban, Symb. Ant. 4: 85. 1903.

Culms branched or simple, glabrous, 8–12 dm. high, the nodes pubescent. Lower leaf-sheaths hirsute; blades glabrous, 1–3 dm. long, 7–17 mm. wide; inflorescence stalked; racemes 4–6 cm. long; spikelets elliptic, acute, about 3.5 mm. long; empty scales glabrate, the flowering one mucronate, finely transversely rugose.

Wet meadows, sandy plains and dunes at lower elevations, in Porto Rico;—Jamaica; Trinidad; Brazil. MALOJILLA.

24. **AXONOPUS** Beauv. Agrost. 12. 1812.

Annual or perennial grasses, with flat leaves and 1-flowered spikelets, borne singly in 2 rows in one-sided spike-like racemes. Spikelets oblong to lanceolate, convex on the outer surface, flat on the inner. Scales 3, the outer 2 membranous, the inner one firm and with its opening turned toward the rachis, subtending a perfect flower. Stamens 3. Styles separate. Stigmas plumose. Grain free. [Greek, foot-axis.] About 12 species, of warm temperate and tropical regions, the following typical.

Rachis of the racemes without hairs.

1. *A. compressus*.

Rachis of the racemes with stiff brown hairs.

2. *A. aureus*.1. **Axonopus compressus** (Sw.) Beauv. Agrost. 12, 154. 1812.*Milium compressum* Sw. Prodr. 24. 1788.*Paspalum tristachyon* Lam. Tab. Encycl. 1: 176. 1791.*Anastrophus compressus* Schlecht.; Nash in Small, Fl. SE. U. S. 79. 1903.? *Paspalum Raunkierii* Mez, Repert. 15: 60. 1917.

Perennial; stolons numerous, leafy, sometimes 6 dm. long; culms 1.5–6 dm. tall, slender, compressed, glabrous; sheaths loose; leaves glabrous, sometimes sparsely ciliate, obtuse, those of the culm 5–10 cm. long, 4–6 mm. wide, those of the stolons about 2.5 cm. long, 2–4 mm. wide; racemes 2–5, 2.5–5 cm. long, approximate at the summit of the long and slender stalk; spikelets not crowded nor secund, about 2 mm. long, acute.

Wet grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan;—southeastern United States; West Indies; continental tropical America. FLAT JOINT-GRASS.

2. **Axonopus aureus** Beauv. Agrost. 12. 1812.

Perennial; culms slender, smooth, erect, 3–6 dm. high, compressed, slender, branching. Leaves more or less pilose with long hairs, the blades 7–15 cm. long, 3–7 mm. wide, rather stiff; inflorescence long-stalked, of 4–15, sessile, slender, pilose, golden-brown racemes 6–10 cm. long; spikelets about 1.5 mm. long, pointed.

Along road between Rio Piedras and Trujillo Alto;—Trinidad; continental tropical America. GOLDEN JOINT-GRASS.

25. **PASPALUM** L. Syst. Nat. ed. 10, 855. 1759.

Perennial grasses, various in habit, with generally flat leaves and 1-flowered spikelets, borne singly or in pairs in 2 rows on 1-sided spikes, which are single, in pairs or paniced. Spikelets oblong to orbicular, flat on the outer surface, convex on the inner. Scales 3 (rarely 4) the outer ones membranous, the inner one indurated and subtending a palet and perfect flower. Stamens 3. Styles separate. Stigmas plumose. Grain ovoid or oblong, free. [An ancient Greek

name for some grass, used by Hippocrates.] About 160 species, of wide distribution in tropical and temperate regions, most abundant in America. Type species: *Panicum dissectum* L.

A. Spikelets not lacerate-margined.

1. Racemes 1 to many, not conjugate.

a. Spikelets with 3 scales.

*Culms erect or ascending.

†Fruiting scale dark brown, shining.

Perennial.

Annual.

††Fruiting scale not dark brown and shining.

†Racemes several or many.

Spikelets pubescent.

Spikelets obovate, about 3 mm. long.

Spikelets nearly hemispheric, about 1.5 mm. long.

Spikelets glabrous.

Panicle dense; rachis long-pilose.

Panicle not dense; rachis glabrous or sparingly pilose.

Lower leaf-sheaths nodulose.

Lower leaf-sheaths not nodulose.

†††Racemes few, 1 to 5.

§Annual; spikelets minute.

§§Perennials.

Raceme always only one; spikelets 1–1.5 mm. long.

Leaves subinvolute; racemes 1.5–2 cm. long.

Leaves flat; racemes 3–4 cm. long.

Racemes 2–10, or on some culms solitary; spikelets 1.5–2 mm. long.

Spikelets narrow, acutish, slender-stalked.

Spikelets broad, obtuse, short-stalked.

Nodes of the culm long-pilose.

Culms glabrous.

Racemes 5–12 cm. long.

Spikelets glandular-pubescent.

Spikelets glabrous, or minutely pubescent.

Spikelets elliptic-obovate.

Spikelets broadly oval.

Racemes 2–4 cm. long; spikelets pubescent.

**Culms creeping; spikelets minute, yellowish

b. Spikelets with 4 scales.

2. Racemes 2, conjugate, rarely a third one below, or on some culms only one.

Spikelets plano-convex, not ciliate.

Spikelets suborbicular; plants not stoloniferous.

Spikelets about 1.2 mm. long.

Spikelets 2–4 mm. long.

Spikelets 2.5–4 mm. long.

Spikelets 2–2.5 mm. long.

Spikelets elliptic to ovate; stoloniferous plants.

Spikelets glabrous, 3–4 mm. long.

Spikelets pubescent, 2.5–3 mm. long.

Spikelets nearly flat, long-ciliate.

∞. Spikelets lacerate-margined.

1. *P. plicatulum*.

2. *P. melanospermum*.

3. *P. virgatum*.

4. *P. paniculatum*.

5. *P. densum*.

6. *P. millegrana*.

7. *P. secans*.

8. *P. parviflorum*.

9. *P. rupestre*.

10. *P. Leoninum*.

11. *P. portoricense*.

12. *P. Poiretii*.

13. *P. Simpsoni*.

14. *P. glabrum*.

15. *P. propinquum*.

16. *P. caespitosum*.

17. *P. orbiculatum*.

18. *P. decumbens*.

19. *P. clavuliferum*.

20. *P. notatum*.

21. *P. minus*.

22. *P. vaginatum*.

23. *P. distichum*.

24. *P. conjugatum*.

25. *P. fimbriatum*.

1. *Paspalum plicatulum* Michx. Fl. Bor. Am. 1: 45. 1803.

Paspalum undulatum Poir. in Lam. Encycl. 5: 29. 1804.

Perennial; culms commonly clustered, flattened, glabrous, 4–10 dm. tall. Leaf-sheaths glabrous, compressed, the blades usually folded, 3 dm. long or less, 2–8 mm. wide, nearly erect, sometimes long-hairy above; racemes usually several, 3–7 cm. long, short-stalked, ascending or spreading; spikelets 2–3 mm. long, obovate to elliptic; first scale wanting; second scale 5-nerved, appressed-pubescent, the third 3-nerved, glabrous, the fruiting one reddish-brown, polished.

Grassy slopes and fields at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; Tortola; Virgin Gorda;—southern United States; Jamaica; Cuba; Hispaniola; Guadeloupe to Tobago; continental tropical America.

2. ***Paspalum melanospermum*** Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816.

Annual; culms glabrous, tufted, erect or the base decumbent, 2-4 dm. high, compressed, often purplish. Leaves glabrous, or sparingly pilose, the sheaths compressed, brownish-margined, the blades nearly linear, flat, whitish-margined, 6-15 cm. long, 4-6 mm. wide; racemes 2 or 3, or on some culms solitary, 3-6 cm. long, the rachis broad; spikelets plano-convex, broadly elliptic-obovate, obtuse, about 2 mm. long; first scale wanting, the second 3-nerved, the fruiting one dark brown, shining.

Shaded slopes at middle and higher elevations, Porto Rico:—Florida; Brazil. Referred by Nash to *P. Boscianum* Fluegge.

3. ***Paspalum virgatum*** L. Syst. ed. 10, 855. 1759.

Perennial, forming clumps; culms stout, erect, 1-2 m. high. Leaves flat, 4-7 dm. long, 1-2.5 cm. wide, the margins scabrous-ciliate, the lower sheaths with transverse veinlets between the veins; racemes many, 5-12 cm. long, with a tuft of long hairs at the base, the whole inflorescence up to 5 dm. long; rachis of the racemes sparingly long-hairy; spikelets crowded, elliptic-obovate, ciliate, 3 mm. long, brownish.

Moist and cultivated grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—West Indies; continental tropical America. CORTEDERO.

4. ***Paspalum paniculatum*** L. Syst. ed. 10, 855. 1759.

Paspalum hemisphericum Poir. in Lam. Encycl. 5: 31. 1804.

Perennial; culms erect, rather stout, glabrous, 6-10 dm. high, often branched. Leaf-blades flat, 2-3 dm. long, 1-2.5 cm. wide, rather densely pilose-pubescent; racemes many, 3-10 cm. long, forming a dense terminal inflorescence; spikelets nearly hemispheric, crowded, pubescent, about 1.5 mm. long, obovate to nearly orbicular; first scale wanting, the second and third 3-nerved, the fruiting one oval, smooth, shining.

Moist meadows, hillsides and ravines, Porto Rico, ascending to 900 m.; St. Thomas (ex Schlechtendal):—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.

5. ***Paspalum densum*** Poir. in Lam. Encycl. 5: 32. 1804.

Perennial; culms erect, smooth, very stout, 1-1.5 m. high. Leaves 4-7 dm. long, about 1 cm. wide, roughish-margined, the lower sheaths with many prominent transverse veinlets between the veins; racemes many, 4-6 cm. long, with a tuft of long hairs at the base, densely clustered, forming a compact inflorescence, 1.5-3 dm. long, the rachis pilose or ciliate; spikelets crowded, sub-orbicular, glabrous, about 2 mm. long.

In shallow water, northern coastal plain of Porto Rico:—Jamaica; Cuba; Guadeloupe; Trinidad; continental tropical America. Porto Rico is the type locality.

6. ***Paspalum millegrana*** Schrad. in Schultes Mant. 2: 175. 1824.

Paspalum Underwoodii Nash, Bull. Torrey Club 30: 375. 1903.

Culms stout, 1-1.5 m. high, often clustered, smooth. Lower sheaths nodulose, overlapping; leaves elongated, roughish, 5-10 mm. wide, commonly pubescent above; racemes many, rather close together, ascending or nearly erect, 4-10 cm. long; spikelets glabrous, suborbicular or obovate-orbicular, about 2 mm. long, usually purplish; rachis sparingly pilose.

Wet grounds at lower elevations near the northern and western coasts of Porto Rico; Vieques:—Bahamas; Jamaica; Cuba; Guadeloupe; Martinique; Barbados; Tobago; Trinidad; South America. Referred by Hackel to *P. lentiginosum* Presl.

7. *Paspalum secans* H. & C. Contr. U. S. Nat. Herb. 18: 319. 1917.

Perennial, forming clumps; culms simple, erect, glabrous, 1–2 m. tall. Leaf-sheaths with a row of white hairs at the mouth, the blades much elongated, sometimes 1 m. long, 5–10 mm. wide, flat, but in drying more or less involute, their margins serrulate; racemes 5–20, slender, spreading, 5–15 cm. long; rachis glabrous; spikelets glabrous, about 2.5 mm. long, 1.5 mm. wide.

Wet grounds at lower and middle elevations, Porto Rico; St. Croix:—Bahamas; Jamaica; Cuba; Antigua. Included by Hackel in *P. elatum* L. C. Rich. and by Nash in *P. Schreberianum* (Fluegge) Nash.

8. *Paspalum parviflorum* Rhode; Fluegge, Mon. Pasp. 98. 1810.

Annual; culms up to 1.5 dm. long, freely branching, the nodes pilose. Leaves flat, linear, narrow, long-pilose; racemes 2 or 3, close together, pilose at the base, 1–2 cm. long; spikelets elliptic, glabrous, obtuse, the first scale wanting, the second and third equal, the fruiting one yellowish, as long as the spikelet.

Porto Rico (type locality, but not since collected here):—South America.

9. *Paspalum rupestre* Trin. Linnaea 10: 293. 1836.

Perennial; culms very slender, usually tufted, more or less pilose at the nodes, 1–2.5 dm. long. Leaves mostly basal, ciliate, 2–5 cm. long, 2.5 mm. wide or less, flat or becoming involute; raceme solitary, very slender, 1.5–2.5 cm. long; spikelets oval, glabrous, about 1 mm. long.

Slopes, Monte Mesa:—Cuba.

10. *Paspalum Leoninum* Chase; Hitchc. Bot. Gaz. 51: 300. 1911.

Perennial; commonly tufted and forming dense small mats; culms slender, glabrous, except the long-hairy nodes, weak, simple, 1.5–3.5 cm. long. Basal leaves numerous, flat, 6–12 cm. long, 2–3 mm. wide, ciliate, somewhat involute in drying, those of the culm 1 or 2, smaller, shorter; raceme 1, very slender, glabrous, 2–4 cm. long; spikelets elliptic, only about 1 mm. long, obtuse; first scale wanting, the second 3-nerved.

Serpentine slopes and shaded rocks, Guanajibo, Monte Mesa, Monte Alegrillo, Indiera Fria:—Cuba.

11. *Paspalum portoricense* Nash, Bull. Torr. Club 30: 377. 1903.

?*Paspalum Richardii* Steud. Syn. Pl. Glum. 1: 17. 1854.

Culms tufted, glabrous, very slender, spreading, 6 dm. long or less, simple or rarely branched. Leaves flat, 5–12 cm. long, 3–5 mm. wide, with a few long hairs at the base; racemes 1–3, very slender, 2–6 cm. long, ascending; spikelets geminate, oblong-elliptic, acute, about 1.8 mm. long, 0.8 mm. wide, glabrous, about as long as the primary pedicel, the scales 3-nerved.

Moist slopes and fields at lower and middle elevations, Porto Rico:—Bahamas (according to Hitchcock and Chase).

12. *Paspalum Poirerii* R. & S. Syst. Veg. 2: 878. 1817.

Paspalum gracile Poir. in Lam. Encycl. Suppl. 4: 313. 1816. Not Rudge 1805.

Perennial; culms densely tufted, 5 dm. high or less, slender, glabrous, simple, or sometimes branched at the base, the nodes pubescent. Leaves 5–10 cm. long, 3–6 mm. wide, glabrous or sparingly hirsute, or ciliate; racemes 1–3, erect or ascending, 2–4 cm. long, the rachis about 0.5 mm. wide; spikelets 1.5 mm. long,

0.9 mm. wide, elliptic, appressed-pubescent singly disposed, the scales 3-nerved, the fruiting one oval.

Slopes, Aguada and Lares; St. Thomas (according to Krebs);—Jamaica; Bahamas; Cuba; Hispaniola. Included by Nash in *P. rupestre* Trin. Mrs. Chase informs us that the application of the name *Poiretii* is not certainly established.

13. ***Paspalum Simpsoni*** Nash Bull. Torr. Club 24: 39. 1897.

Paspalum gracillimum Nash, in Small, Fl. SE. U. S. 73. 1903.

Tufted, similar to *P. caespitosum*; culms slender, 4–8 dm. high. Basal sheaths hirsute, the upper glabrous; leaves flat, linear-lanceolate, 4–10 cm. long, 3–10 mm. wide, glabrous on both sides, the margins ciliate; racemes 3–5, spreading, 2–7 cm. long, the rachis narrow; spikelets in pairs, obovoid, about 1.5 mm. long, and 0.8 mm. thick, the first scale wanting, the second and third 3-nerved, densely pubescent with short glandular hairs.

Sandy soil. Joyuda; Mona;—Florida; Bahamas; Jamaica; Cuba.

14. ***Paspalum glabrum*** Poir. in Lam. Encycl. 5: 30. 1804.

Paspalum milioides Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816.

Paspalum Helleri Nash, Bull. Torr. Club 30: 376. 1903.

Culms tufted, slender, glabrous, erect or ascending, simple, 3–10 dm. high. Leaves 5–20 cm. long, 3–8 mm. wide, roughish-margined, with a few hairs at the base of the blade; racemes 2–6, narrow, 10 cm. long or less, erect or spreading; spikelets many, oval, glabrous or pubescent, 1.7–2 mm. long, obtuse.

Sandy and rocky soil at lower and middle elevations, Porto Rico; Desecheo; Mona; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—Florida; West Indies.

15. ***Paspalum propinquum*** Nash, Bull. N. Y. Bot. Gard. 1: 291. 1899.

Perennial; culms clustered, slender, glabrous, up to 6 dm. long, ascending or spreading. Leaf-sheaths glabrous or the lower ones pubescent; blades 5–15 cm. long, 8 mm. wide or less, ciliate with long hairs at least near the base; racemes solitary or 2 together, slender, 5–7 cm. long; spikelets oval, puberulent, a little less than 2 mm. long.

In dry soil, plains and hillsides of the northern districts, Porto Rico;—southeastern United States; Cuba; Jamaica. Probably not distinct from *P. ciliatifolium* Michx.

16. ***Paspalum caespitosum*** Fluegge, Mon. Pasp. 161. 1810.

Paspalum Blodgettii Chapm. Fl. S. U. S. 571. 1860.

Tufted; culms slender, 3–6 dm. high. Leaves glabrous, narrowly linear, flat, 5–20 cm. long, 3–7 mm. wide, erect or nearly so, with glabrous sheaths; racemes 2–6, erect, 1–5 cm. long, the rachis very narrow; spikelets in pairs, a little less than 2 mm. long and nearly 1 mm. wide, elliptic, the first scale wanting, the second and third sparingly papillose-pubescent with appressed hairs, 3-nerved, the fruiting scale yellowish-white.

Woods and thickets at lower elevations in dry districts, Porto Rico; Mona; St. Thomas (according to Krebs);—Florida; Bahamas; Jamaica; Cuba; Hispaniola.

17. ***Paspalum orbiculatum*** Poir. in Lam. Encycl. 5: 32. 1804.

Paspalum pusillum Vent.; Fluegge, Mon. Pasp. 100. 1810.

Perennial; glabrous; culms prostrate, often rooting at the nodes, slender, sometimes 4 dm. long or longer, the flowering branches erect, 5–20 cm. high. Leaves short, lanceolate, flat, 2–5 cm. long, 7 mm. wide or less, mostly spreading;

racemes 2-4, short-exserted from the upper leaf-sheath, 1-3 cm. long; spikelets orbicular-elliptic, smooth, yellowish, a little less than 1 mm. long.

Wet banks and along shaded streams at lower and middle elevations, Porto Rico; St. Thomas (type locality of *P. pusillum*, but not collected there recently):—Hispaniola; Dominica; Martinique; Trinidad; continental tropical America.

18. ***Paspalum decumbens*** Sw. Prodr. 22. 1788.

Paspalum pedunculatum Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816.

Perennial; culm decumbent, rooting at the lower nodes, branched, 2-5 dm. long. Leaves glabrous or more or less pubescent, ciliate, the blades 5-10 cm. long, 12 mm. wide or less; racemes solitary, 1.5-4 cm. long; spikelets glabrous, paired, about 1.5 mm. long, the first scale orbicular, the second and third 3-nerved, the fruiting one oval, longitudinally papillose.

Shaded banks and woods in wet districts, Porto Rico, ascending to 800 m.:—Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America.

19. ***Paspalum clavuliferum*** C. Wright; Sauvalle, Anal. Acad. Habana 8: 203. 1871.

Perennial culms tufted, slender, weak, simple or few-branched, 4 dm. long or less. Leaves flat, pilose-pubescent, 1-2 mm. wide; racemes 2, sometimes 3 (rarely only 1), slender, straight or slightly curved, 2-5 cm. long; spikelets elliptic-obovate, plano-convex, pubescent, 1.5 mm. long.

Hillsides and plains at lower elevations in the northern and western districts of Porto Rico:—Cuba; Mexico to South America.

20. ***Paspalum notatum*** Fluegge, Mon. Pasp. 106. 1810.

Perennial by a short, tough rootstock; culms simple, glabrous, clustered or solitary, 1.5-4 dm. high, erect or nearly so. Leaf-sheaths ciliate or glabrous, the blades flat, glabrous or sparingly pubescent, 6-20 cm. long, 4-8 mm. wide; racemes 2, conjugate, straight or becoming somewhat curved, 3-6 cm. long or sometimes longer; spikelets oval, glabrous, obtuse, 2.5-3 mm. long, the first scale wanting, the third 3-5-nerved.

Wet meadows, slopes and along streams at lower and middle elevations, Porto Rico; St. Thomas (type locality, but not found there by recent collectors):—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Martinique; Grenada; continental tropical America.

21. ***Paspalum minus*** Fourn. Mex. Pl. 2: 6. 1886.

Closely resembles *Paspalum notatum* and may not be specifically distinct from that species. The two racemes are more widely divergent than those of *notatum* and the spikelets are a little less than 2.5 mm. long.

Trujillo Alto (ex Hitchcock & Chase):—Jamaica; Cuba; continental tropical America.

22. ***Paspalum vaginatum*** Sw. Prodr. 21. 1788.

Culms 2-6 dm. tall, from a long stout rootstock; sheaths compressed, keeled, usually crowded and overlapping, at least at the base and on the innovations, glabrous; leaves folded, or involute when dry, 1.5 dm. long or less, 2-4 mm. wide, glabrous or sparingly hairy; racemes terminal, usually in pairs, rarely more or but a single one, erect or ascending, 3-7 cm. long; spikelets singly disposed, ovate-lanceolate, acute, 3-4 mm. long, the 2 outer scales glabrous, thin, the first scale 4-nerved, the lateral nerves approximate at the margin, the midnerve suppressed, the second scale 5-nerved, the lateral nerves rather near together, the third scale glabrous at the apex or with 2 or 3 hairs.

Brackish soil along the coasts of Porto Rico; Mona; Vieques; St. Croix; Tortola:—southern United States; West Indies; continental tropical America.

23. *Paspalum distichum* L. Pl. Jam. Pugil. 5. 1759.

Culms 1-6 dm. tall, from a long stout rootstock; sheaths compressed, keeled, usually crowded and overlapping, especially at the base and on the innovations, glabrous, or more or less hairy on the margins; leaves commonly less than 1 dm. long, 3-6 mm. wide, usually glabrous; racemes terminal, in pairs, ascending, 2-5 cm. long; spikelets singly disposed, ovate, 2.5-3 mm. long, acute, the 2 outer scales firm, 5-nerved, rarely 7-nerved, the first scale glabrous, the second appressed-pubescent, the third apiculate, pubescent at the apex.

Wet grounds at low elevations near the coasts of Porto Rico; Vieques; St. Croix:—United States; Bermuda; West Indies; continental tropical America and Old World tropics. JOINT-GRASS.

24. *Paspalum conjugatum* Berg. Act. Helv. Phys. Math. 7: 129. 1762.

Smooth and glabrous. Culms compressed, 2-9 dm. tall, finally decumbent at the base and rooting at the lower nodes; leaves 4-16 cm. long, 4-12 mm. wide; racemes in pairs, slender, often curved, spreading or ascending, 5-12 cm. long, the rachis straight, or flexuous toward the apex, 0.6-0.8 mm. broad; spikelets crowded, much compressed dorsally, singly disposed, 1.5 mm. long, 1-1.2 mm. broad, apiculate, the 2 outer scales 2-nerved, the nerves marginal, the first scale ciliate on the margins with very long lax hairs, the third scale smooth, white.

Hillsides and fields at lower and middle elevations, Porto Rico, ascending into the Luquillo Mountains; Vieques; St. Croix; St. Thomas; St. Jan:—southern United States; Bermuda; Bahamas; Jamaica; Cuba to Trinidad; Margarita; continental tropical America.

25. *Paspalum fimbriatum* H.B.K. Nov. Gen. 1: 93. 1815.

Annual; culms tufted, glabrous, often branched below, 3-8 dm. high, the sheaths hirsute or glabrous. Leaves 1-2.5 dm. long, 1.5 cm. wide or less, ciliate; racemes 2-6, erect or ascending, 2.5-7 cm. long; spikelets mostly in pairs, sub-orbicular, 2.5-3.5 mm. long, the scales papillose, 3-nerved, the lower one with a broad cleft wing, with ciliate segments, the next with a similar partial wing, the fruiting scale 7-ridged.

Waste grounds, Porto Rico; Vieques; St. Croix:—West Indies; continental tropical America.

Paspalum molle Poir. in Lam. Encycl. 5: 34. 1804.

A species described from St. Thomas, not understood by modern botanists.

Paspalum spathaceum Desv.; Poir. in Lam. Encyc. Suppl. 4: 314, 1816.

St. Thomas (ex Schlechtendal). A species not understood by modern botanists.

26. **PANICUM** L. Sp. Pl. 55. 1753.

Annuals or perennials, various in habit, with open or contracted panicles, spikelets 1-2-flowered, when 2-flowered the lower one staminate only. Scales 4- the 3 lower membranous, empty, or the third with a staminate flower, varying in the same species; the inner or fourth scale chartaceous, shining, enclosing a palea of similar texture and a perfect flower. Awns none. Stamens 3. Styles distinct. Stigmas plumose. Glauca free, enclosed in the hardened fruiting scale and

palet. [Old Latin name for some grass, probably the cultivated sorghum, referring to its panicle, taken from Pliny.] About 500 species, in temperate and tropical regions, known as PANIC-GRASS. Type species: *Panicum miliaceum* L.

- A. Panicle-branchlets prolonged as a bristle beyond the uppermost spikelet. 1. *P. ulovanaceum*.
- B. Panicle-branchlets not prolonged as a bristle
1. Basal leaves similar to those of the culm.
- a. Fourth scale transversely wrinkled.
- Perennial species.
- Panicle open, diffusely branched. 2. *P. maximum*
- Panicle of secund racemes. 3. *P. geminatum*.
- Nodes of the culm glabrous. 4. *P. barbinode*.
- Nodes of the culm bearded.
- Annual species. 5. *P. reptans*.
- Culms prostrate or spreading. 6. *P. fasciculatum*.
- Culms erect or ascending. 7. *P. adpersum*.
- Spikelets glabrous, reticulate veined.
- Spikelets pubescent, scarcely reticulate-veined.
- b. Fourth scale not transversely wrinkled.
- *First scale truncate, short. 8. *P. aquaticum*.
- Spikelets acute. 9. *P. elephantipes*.
- Spikelets acuminate.
- **First scale not truncate.
- †Annual species. 10. *P. miliaceum*.
- Spikelets about 5 mm. long. 11. *P. trichoides*.
- Spikelets about 1.2 mm. long.
- ††Perennial species.
- ‡Spikelets in open or contracted panicles.
- §Panicle narrow; spikelets few; leaves involute. 12. *P. tenerum*.
- Spikelets pointed, about 2.5 mm. long.
- Spikelets not pointed, about 1.5 mm. long. 13. *P. stenodes*.
- §§Panicles open, mostly large; spikelets several or many; leaf-blades flat.
- First scale about one-fifth as long as the spikelet. 14. *P. Schiffneri*.
- First scale about one-third as long as the spikelet.
- Culms erect, not rooting at the lower nodes. 15. *P. diffusum*.
- Leaf-blades 1-3 mm. wide. 16. *P. Ghiesbreghtii*.
- Leaf-blades 6-12 mm. wide.
- Culms decumbent, rooting at the lower nodes. 17. *P. glutinosum*.
- Spikelets viscid. 18. *P. trichanthum*.
- Spikelets not viscid. 19. *P. parvifolium*.
- Leaf-blades 10-25 mm. wide.
- Leaf-blades 2-6 mm. wide.
- ‡‡Spikelets forming spike-like, more or less secund racemes in the panicles. 20. *P. condensum*.
- Culms erect; panicle dense. 21. *P. laxum*.
- Culms decumbent; panicles not dense.
- Leaf-blades narrowed at the base.
- Leaf-blades cordate or truncate at the base. 22. *P. Stevensianum*.
- Spikelets about 2 mm. long; panicle-branches nearly erect. 23. *P. boliviense*.
- Spikelets about 1.5 mm. long; panicle-branches spreading. 24. *P. polycaulon*.
2. Basal leaves usually broader and shorter than those of culm, forming rosettes.
- a. Plants branching from the base.
- b. Plants branching from the nodes.
- *Leaf-blades long and stiff.
- Nodes not bearded. 25. *P. aciculare*.
- Spikelets 2 mm. long. 26. *P. fusiiforme*.
- Spikelets 3 mm. long. 27. *P. chrysopsidifolium*.
- Nodes bearded.
- **Leaf-blades not long and stiff. 28. *P. portoricense*.
- Spikelets turgid, blunt, strongly nerved.
- Spikelets not turgid nor strongly nerved.
- Ligule long-hairy. 29. *P. leucothrix*.
- Leaf-sheaths glabrous or nearly so. 30. *P. acuminatum*.
- Leaf-sheaths very pubescent. 31. *P. scoparium*.
- Ligule obsolete; plants velvety-pubescent.

1. **Panicum utowanaeum** Scribn.; Millsp. Field Mus. Bot. 2: 25. 1903.

Panicum Sintenisii Nash, Bull. Torrey Club 30: 382. 1903.

Perennial by slender rootstocks; culms glabrous, rather weak, little branched, 2-6 dm. long. Leaf-sheaths ciliate above; ligule a few short stiff hairs; blades 2 dm. long or less, 1-4 mm. wide, glabrous, or the upper surface pilose toward the base; panicles slender, 3-10 cm. long, with nearly erect branches, the branchlets prolonged beyond the uppermost spikelet into a bristle 2-4 mm. long; spikelets about 2 mm. long, nearly sessile, ellipsoid, glabrous, the first scale acute, 1 mm. long, 3-nerved, the second 3-5-nerved, the fruit rugulose.

Hillsides at lower elevations in dry parts of the southwestern districts of Porto Rico; Desecheo; Mona; Muertos; Anegada:—Cuba; Guadeloupe; Venezuela.

2. **Panicum maximum** Jacq. Ic. Pl. Rar. 1: 2, pl. 13. 1786.

Panicum jumentorum Pers. Syn. 1: 83. 1805.

Perennial; culms 1-2 m. tall or more, leafy; leaf-sheaths overlapping, glabrous, or tuberculate-pubescent; blades elongated, 1-4 cm. wide, glabrous; panicle 3-6 dm. long, its branches erect or nearly so, very long; spikelets glabrous, 3-4 mm. long, the fourth scale transversely rugose.

Fields and banks at lower and middle elevations, Porto Rico; Mona; Icacos; Muertos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—widely naturalized in tropical and subtropical regions after planting for fodder. Native of tropical Africa. GUINEA GRASS. YERBA GUINEA.

3. **Panicum geminatum** Forsk. Fl. Aegypt.-Arab. 18. 1775.

Panicum brizoides Lam. Tabl. Encyc. 1: 170. 1791. Not L. 1771.

Paspalum appressum Lam. Tabl. Encycl. 1: 176. 1791.

Aquatic. Culms 6-12 dm. long, usually clothed with sheaths below; leaves glabrous, 2.5 dm. long or less, 6-10 mm. wide; racemes 10-20, one-sided, the rachis broadly winged, appressed, 2-4 cm. long; spikelets about 2.5 mm. long, ovate, acute, glabrous, singly disposed in 2 rows, the first scale broader than long and clasping the spikelet at its base, truncate at the apex, the fourth scale transversely wrinkled.

Banks and borders of streams and lakes at lower elevations and in coastal salinas, Porto Rico; Icacos; St. Thomas; St. Jan; St. Croix; Anegada:—Florida; Texas; Bahamas, Jamaica; Cuba to Martinique; Curacao; Aruba; continental tropical America and Old World Tropics. [*P. paspaloides* of authors, not of Persoon.] WATER-GRASS.

4. **Panicum barbinode** Trin. Mem. Acad. St. Petersb. VI. Sci. Nat. 1: 256. 1834.

Sterile culms 1-2 m. long, rooting at the nodes, the fertile ones erect, 6-10 dm. tall or more; the nodes densely barbed; leaf-sheaths often overlapping, papillose-hirsute; blades 1-3 dm. long, glabrous or pubescent, 6-16 mm. wide; panicle 1.5-2 dm. long, its branches spreading or ascending; spikelets about 3 mm. long, glabrous.

Wet meadows, marshes and in cultivated grounds, Porto Rico, at lower elevations; Mona; Culebra; Vieques; St. Croix; Tortola:—southern United States; Bermuda; West Indies; continental tropical America. Native of South America. A valuable fodder-grass [*Panicum molle* of authors, not Swartz.] PARA GRASS. MALOJILLO. YERBA PARA

5. **Panicum reptans** L. Syst. ed. 10, 870. 1759.

Panicum grossarium L. Syst. ed. 10, 871. 1759.

Panicum prostratum Lam. Tabl. Encycl. 1: 171. 1791.

Panicum caespitosum Sw. Fl. Ind. Occ. 146. 1797.

P. prostratum pilosum Eggecs, Bull. U. S. Nat. Mus. 13: 101. 1879.

Annual; culms prostrate or decumbent, usually much-branched, rooting at the lower nodes, the flowering branches 1-3 dm. high, glabrous, or the nodes puberulent. Leaf-sheaths ciliate; ligule a dense row of hairs; blades lanceolate, ciliate at the base, subcordate, 6 cm. long or less, 4-12 mm. wide; panicle at length long-stalked, of several secund spike-like racemes 1-3 cm. long; spikelets elliptic, about 2 mm. long, the first scale very short. [*P. repens* of Krebs, not of Swartz.]

Hillsides and cultivated ground, Porto Rico, in dry parts of the southern districts; Vieques; St. Croix; St. Thomas; St. Jan.—southern United States; Mexico; Jamaica; Cuba to Tobago; Margarita; Curacao; continental tropical America and Old World.

6. ***Panicum fasciculatum*** Sw. Prodr. 22. 1788.

Panicum carthaginense Sw. Prodr. 22. 1788.

Panicum fuscum Sw. Prodr. 23. 1788.

Panicum flavescens Sw. Prodr. 23. 1788.

P. fuscum fasciculatum Griseb. Fl. Br. W. I. 547. 1864.

P. fasciculatum flavescens Doell. in Mart. Fl. Bras. 2^o: 205. 1877.

Panicum paniculatum Nash, Bull. Torr. Club 30: 381. 1903. Not Kuntze 1898.

Perennial; culms glabrous or somewhat pubescent above, slender or rather stout, erect, spreading or ascending, 0.3-1 m. long. Leaves flat, 3 dm. long or less, 0.6-2 cm. wide, glabrous or more or less pubescent, the sheaths sometimes pilose or hispid; panicles 5-15 cm. long, the branches raceme-like, ascending; spikelets commonly approximate, short-stalked, brown, 2-2.5 mm. long, glabrous, the outer scales reticulate-veined, the fourth scale rugose.

Moist banks, hillsides and woodlands, Porto Rico, at lower and middle elevations; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—southern United States; West Indies; continental tropical America. [*Urochloa fasciculata* of Krebs.]

7. ***Panicum adpersum*** Trin. Gram. Pan. 146. 1826.

Culms ascending or spreading, rooting at the lower nodes, branched, compressed, glabrous, 3-10 dm. long. Sheaths ciliate above; leaf-blades 5-20 cm. long, 8-20 mm. wide, glabrous, or sometimes ciliate at the base, rather stiff, abruptly acuminate, rough-margined; panicles 6-15 cm. long, composed of many spike-like racemes; spikelets short-stalked, 3-4 mm. long, 1.5-1.8 mm. wide, fusiform; first scale acute, glabrous, 5-nerved, about one-third as long as the whole spikelet; second and third scales, hispid at least above, rarely glabrous.

Banks and hillsides at lower elevations in dry parts of the southern districts of Porto Rico, extending north to Guanajibo on the western coast; Mona; Muertos; Vieques; St. Croix; St. Jan; Tortola; Virgin Gorda.—southern United States; Bahamas; Jamaica; Cuba; Hispaniola; Saba; Guadeloupe.

8. ***Panicum aquaticum*** Poir. in Lam. Encycl. Suppl. 4: 281. 1816.

Perennial; culms rather stout, glabrous, decumbent below and rooting at the nodes, simple or branching, the branches nearly erect, 2-5 dm. high. Leaf-sheaths glabrous, or pilose above; blades 8-25 cm. long, 5-10 mm. wide, glabrous, or sparingly pilose above; panicles short-stalked, open, 8-20 cm. long, the filiform branches spreading, smooth or nearly so; spikelets about 3 mm. long, 1 mm. wide, acute, the first scale short, truncate, the second and third strongly nerved. [Referred by Hackel to *P. proliferum* Lam.]

Wet grounds at lower and middle elevations, Porto Rico.—Cuba; Trinidad; continental tropical America. Recorded by Krebs from St. Thomas.

9. ***Panicum elephantipes*** Nees, Agrost. Bras. 165. 1829.

Annual; culms ascending from a decumbent base, rooting at the lower nodes, somewhat fleshy, up to 1 m. long, stout, sometimes 2 cm. thick, glabrous, the nodes usually blackish. Leaf-sheaths glabrous, the blades 1.5-5 dm. long, 7-20 mm. wide, pilose above near the base; panicles open, 2-4 dm. long, their slender

branches ascending; spikelets acuminate, 4-5 mm. long; first scale 1-1.5 mm. long, subtruncate, the second and third 7-9-nerved. [Referred by Hackel to *P. chloroticum pingue* Nees.]

Wet grounds at low elevations, Porto Rico:—Cuba; Jamaica; continental tropical America.

10. ***Panicum miliaceum*** L. Sp. Pl. 58. 1753.

Culms erect or decumbent, rather stout, 3 dm. tall or more, glabrous or hirsute. Sheaths papillose-hirsute; leaves 1.25-2.5 dm. long, 8-25 mm. wide, more or less pubescent; panicle rather dense, 1-2.5 dm. long; branches erect or ascending; spikelets 5 mm. long, acuminate; first scale about two-thirds as long as the spikelet, acuminate, 5-7-nerved; second scale acuminate, 13-nerved, somewhat exceeding the 7-13-nerved acuminate third one, which subtends an empty palea; fourth scale shorter than the third, becoming indurated, obtuse.

Waste grounds, St. Croix:—United States. Native of the Old World. HOG MILLET.

11. ***Panicum trichoides*** Sw. Prodr. 24. 1788.

Panicum brevifolium of authors. Not L. 1753.

Panicum capillaceum Lam. Tabl. Encycl. 1: 173. 1791.

Annual; culms slender, ascending or erect, 6 dm. high or less, pubescent. Sheaths pubescent and ciliate; leaf-blades membranous, 2-7 cm. long, 1-2 cm. wide, ovate-lanceolate, acuminate at the apex, cordate-clasping at the base, glabrous or sparingly pubescent; panicles 2 dm. long or less, their branches filiform, spreading and ascending; spikelets nearly ellipsoid, about 1.2 mm. long, sparingly hirsute; first scale acute, 1-nerved, about one-half as long as the whole spikelet; second and third scales 3-nerved.

Banks, hillsides, woods and along streams, Porto Rico, ascending to high elevations; St. Thomas (ex Eggers); Tortola:—West Indies; continental tropical America.

12. ***Panicum tenerum*** Beyr.; Trin. Mem. Acad. St. Petersburg. VI. Nat. 1: 341. 1834.

Perennial; culms slender, stiff, tufted, glabrous, 4-9 dm. high. Sheaths glabrous, or the lower softly pubescent; leaf-blades 4-15 cm. long, 2-4 mm. wide, or the upper much smaller, erect, somewhat involute in drying, somewhat pubescent, at least toward the base; panicles solitary and terminal, 3-8 cm. long, or also a few smaller ones lateral; spikelets 2-2.8 mm. long, about 1 mm. wide, pointed, short-stalked, rather crowded; first scale about one-half the length of the whole spikelet, 1-nerved, the second and third 5-7-nerved.

Moist white sand near Manati:—southeastern United States; Bahamas; Cuba.

13. ***Panicum stenodes*** Griseb. Fl. Br. W. 1. 547. 1861.

Perennial; culms tufted, wiry, glabrous, erect or reclining, 5 dm. high or less, usually branched at or above the middle, the branches elongated. Leaves glabrous, the blades 1-4 cm. long, involute, 1-2 mm. wide; panicles small, only 1-2 cm. long, the subracemose spikelets about 1.5 mm. long, elliptic; first scale about one-half the length of the spikelet, nerveless or 1-nerved, the second and third 5-nerved.

Savanna near San Juan on road to Trujillo Alto:—Jamaica; Cuba; Hispaniola; continental tropical America.

14. ***Panicum Schiffneri*** Hack. Ergeb. Bot. Exp. Sudbras. 11. 1906.

Perennial; culms slender, decumbent, ascending or clambering, with long diverging branches, glabrous or more or less hirsute. Leaf-sheaths papillose-



hispid, at least above, the blades flat, lanceolate, 10–18 cm. long, 1–2.5 cm. wide, scabrate and sometimes sparingly hispid, the base narrowed; panicles 10–15 cm. long, the filiform branches spreading or the lower reflexed, scabrous, pilose at the base; spikelets clustered on the branchlets, glabrous, about 2 mm. long and 1 mm. thick, obtuse, first scale very short, the second and third about equal. [*Panicum commelinacifolium* R. & S.]

River banks and wet slopes, Porto Rico:—Martinique; St. Vincent; continental tropical America.

15. ***Panicum diffusum*** Sw. Prodr. 23. 1878.

Perennial; culms tufted, spreading or ascending, simple or little branched, glabrous with pubescent nodes, 2–5 dm. high. Sheaths striate, glabrous or pubescent; leaf-blades 2 dm. long or less, 1–3 mm. wide, sparingly pubescent; panicles 5–10 cm. long, open, the branches filiform; spikelets few, near the ends of the panicle-branches, short-stalked, about 2 mm. long and 1 mm. wide; first scale acute, about one-half as long as the spikelet; second and third scales 7–9-nerved.

Hillsides near the coast, western and northwestern districts of Porto Rico; St. Croix (ex Grisebach); St. Thomas; St. Jan; Tortola:—West Indies, south to Martinique.

16. ***Panicum Ghiesbreghtii*** Fourn. Mex. Pl. 2: 29. 1886.

Panicum hirtiraginum Hitchc. Contr. U. S. Nat. Herb. 12: 223. 1909.

Perennial; culms erect, tufted, rather stout, 6–8 dm. high, the nodes hirsute. Sheaths hirsute; leaf-blades flat, up to 6 dm. long and 12 mm. wide, hirsute or glabrate; panicle 2–3 dm. long, its branches ascending; spikelets numerous, short-stalked, about 3 mm. long and 1 mm. wide; first scale acute, one-half to two-thirds as long as the whole spikelet; second and third scales 7–9-nerved. [Recorded by Hackel as *P. diffusum* Sw.]

Moist meadows at lower elevations, Porto Rico:—Bahamas; Jamaica; Cuba; continental tropical America.

17. ***Panicum glutinosum*** Sw. Prodr. 24. 1788.

Perennial; culms erect with a decumbent base, rooting at the lower nodes, rather stout, glabrous, 1–2 m. high. Leaf-sheaths glabrous or pilose, bearded at the mouth, the blades 1.5–5 dm. long, 1–2.5 cm. wide, long-acuminate, ciliate toward the base; panicles open, 1–3 dm. long, their branches ascending, bearded at the base, the lower verticillate, the branchlets scabrous and sometimes viscid; spikelets slender-stalked, viscid, about 3 mm. long, the first and second scales about equal.

Banks, hillsides and forests at middle and higher elevations in wet or moist districts, Porto Rico; St. Croix (ex West):—Jamaica; Cuba; Hispaniola; continental tropical America.

18. ***Panicum trichanthum*** Nees, Agrost. Bras. 210. 1829.

Perennial; culms often clustered, glabrous, slender, decumbent or ascending, up to 2 m. long. Leaf-sheaths glabrous or ciliate, sometimes villous at the mouth, the blades lanceolate, glabrous or sparingly pubescent, 8–15 cm. long, 1–2.5 cm. wide, the base cordate, the apex acuminate; panicles diffuse, 1–3 cm. long, the spreading branches and branchlets capillary; spikelets very numerous, nearly oblong, acute, about 1.3 mm. long; first scale very short, the second and third 3-nerved.

Thickets, woods and river banks in wet or moist districts, Porto Rico:—Cuba; Jamaica; Trinidad; continental tropical America.

19. **Panicum parvifolium** Lam. Tabl. Encycl. 1: 173. 1791.

Panicum oplismenoides Nash, Bull. Torr. Club 30: 381. 1903. Not Hack. 1888.

Perennial; culms slender, creeping or decumbent, rooting at the nodes, branched, glabrous, or the nodes sometimes pilose, 2-8 dm. long. Leaf-sheaths glabrous or sparingly pilose or ciliate, the blades lanceolate, short, 1-3 cm. long, 2-7 mm. wide, sometimes pilose near the rounded or subcordate base; panicles short-stalked, 2-6 cm. long, the branches filiform, spreading; spikelets glabrous, about 1.5 mm. long, obtuse; first scale about 0.7 mm. long, the second and third 5-nerved; fruit smooth, shining.

Wet grounds, northern coastal plain of Porto Rico:—Jamaica; Cuba; Trinidad, continental tropical America.

20. **Panicum condensum** Nash in Small, Fl. SE. U. S. 93. 1903.

Culms tufted, branched, 0.6-1 m. tall, the basal sheaths compressed and keeled. Leaf-blades 2-4 dm. long, 6-8 mm. wide, erect or nearly so; panicles large, dense, oblong, 1-2.5 dm. long, their branches erect; spikelets numerous, about 2.3 mm. long, acute, glabrous; first scale acuminate, about one-half the length of the whole spikelet; second and third scales acuminate.

Swamps and borders of lakes, northern coastal plain of Porto Rico:—southeastern United States; Bahamas; Jamaica; Cuba; Guadeloupe (?); Mexico.

21. **Panicum laxum** Sw. Prod. 23. 1788.

Panicum agrostidiiforme Lam. Tabl. Encycl. 1: 172. 1791.

Panicum tenuiculmum Meyer, Prim. Fl. Esseq. 58. 1818.

Culms simple or little branched, often decumbent and rooting at the lower nodes, 4-12 dm. high. Sheaths hirsute above, otherwise glabrous; blades 1-2.5 dm. long, 4-15 mm. wide, glabrous, or sparingly pubescent on the upper side; panicles 0.5-3 dm. long, with many, slender spike-like branches, the lower branches spreading, the ultimate branchlets mostly secund; spikelets 1-1.5 mm. long, about 0.7 mm. wide, short-stalked; first scale 1-3-nerved, about one-third the length of the whole spikelet, the second somewhat shorter than the third. [*P. pilosum* of Krebs.]

Moist or wet soil, Porto Rico, ascending to at least 900 m.; Vieques; St. Thomas; Tortola:—West Indies; continental tropical America.

22. **Panicum Stevensianum** H. & C. Contr. U. S. Nat. Herb. 17: 498. 1915.

Perennial; culms compressed, 3-6 dm. long, prostrate, rooting at the nodes, the branches ascending, about 3 dm. high. Leaf-sheaths ciliate, keeled, the blades flat, glabrous, 4-10 cm. long, 10 mm. wide or less, the base truncate or subcordate, sometimes ciliate; panicle short-stalked, 6-10 cm. long, narrow, its spike-like branches nearly erect and appressed; spikelets crowded, about 2 mm. long, acute; first scale about one-fourth the length of the spikelet; the second and third 3-5-nerved, about equal.

In wet white sand, Laguna de Tortuguero:—Cuba.

23. **Panicum boliviense** Hack. Repert. 11: 19. 1912.

Perennial; culm creeping or decumbent and rooting at the lower nodes, rather slender, glabrous, branched, the branches erect, 5-15 dm. high. Leaf-sheaths glabrous, or hirsute above, with ciliate margins, the blades flat, 5-16 cm. long, 8-20 mm. wide, the base subcordate, clasping, ciliate; panicle stalked, 7-25 cm. long, its branches spike-like, distant, or the upper approximate; spikelets nearly sessile, about 1.5 mm. long, and one-half as wide as long, the first scale short, the second and third about equal in length, obtuse.

Hillsides, Tortola:—Cuba; St. Kitts (?); continental tropical America.

24. ***Panicum polycaulon*** Nash, Bull. Torr. Club 24: 200. 1897.

Densely tufted, forming rosettes or small mats, the basal leaves much larger than those of the culms; culms glabrous, simple, or branched at the base, 6–20 cm. high, often many together. Basal leaf-blades linear-lanceolate, 3–7 cm. long, 2–6 mm. wide, ciliate, the sheaths ciliate; panicles pilose, 4–7 cm. long; spikelets filiform-stalked, glabrous, 1.5–2 mm. long, obovate, obtuse; first scale about one-third as long as the spikelet, acutish; second and third scales nerved.

Grassy places at lower and middle elevations in moist districts, Porto Rico;—southeastern United States; Jamaica; Cuba. Referred by Hackel to *P. ciliatum* Ell.

25. ***Panicum aciculare*** Desv.; Poir. in Lam. Encycl. Suppl. 4: 274. 1816.

Culms slender, ascending, 1–3 dm. long, pubescent at least above, at length bushy-branched and forming cushion-like masses. Leaf-sheaths villous or ciliate, the blades linear, rather stiff, involute and tapering to a sharp tip, glabrous, or the lower pilose, 4–7 cm. long, 2–5 mm. wide, or those of the culms much smaller and narrower; panicles 3–7 cm. long; spikelets about 2 mm. long and 1 mm. thick, obovoid, obtuse; first scale about one-fourth the length of the spikelet, the second and third papillose-pubescent.

Hillsides at lower and middle elevations, Porto Rico;—southern United States; Cuba.

26. ***Panicum fusiforme*** Hitchc. Contr. Nat. Herb. 12: 222. 1909.

Culms tufted, up to 7 dm long, usually shorter, pubescent, ultimately bushy-branched. Leaves stiff, somewhat pubescent, or ciliate, their sheaths villous, their blades long-acuminate, 10 cm. long or less; panicles exserted; spikelets ellipsoid, pubescent, about 3 mm. long, the first scale obtuse.

Summit of El Yunque;—Florida; Jamaica; Cuba; British Honduras.

27. ***Panicum chrysopsidifolium*** Nash in Small, Fl. SE. U. S. 100. 1903.

Culms slender or rather stout, 4.5 dm. long or less, densely villous, often purplish, at length diffusely branched and matted, the nodes bearded. Leaves villous, rather stiff, the blades of the lower or basal ones 5–10 cm. long, 3–8 mm. wide, those of the later branches much smaller and narrower; panicles at length long-stalked, 4–7 cm. long, with filiform, flexuous branches; spikelets obovoid, obtuse, about 2 mm. long; first scale about one-third the length of the spikelet, the second and third villous. [Recorded by Hackel as *P. angustifolium* Ell. and as *P. consanguineum* Kunth.]

Slopes and banks at lower and middle elevations in moist or wet districts, Porto Rico, ascending into the Luquillo Mountains;—southeastern United States; Cuba.

28. ***Panicum portoricense*** Desv.; Hamilt. Prodr. 11. 1825.

Panicum pauciciliatum Ashe, Journ. Elisha Mitchell Soc. 16: 87. 1900.

Culms commonly clustered, ascending or decumbent, puberulent or glabrate, 3 dm. long or less, at length branched from most of the nodes. Sheaths usually ciliate, at least above; ligules inconspicuous; blades rather thin, glabrous or puberulent, 2–5 cm. long, 3–6 mm. wide, or those of the later branches much smaller; panicle small, 2–6 cm. long, glabrous; spikelets usually few, turgid, obliquely obovoid, blunt, 1.5 mm. long; first scale about one third the length of the spikelet, obtuse, the second and third strongly 7–9-nerved, puberulent. [Recorded by Hackel as *P. Nashianum* Scribn.]

Sandy soil northern coastal plain of Porto Rico;—southeastern United States; Cuba.

29. ***Panicum leucothrix*** Nash, Bull. Torr. Club 24: 41. 1897.

Culms tufted, pubescent or puberulent at least above, slender, ascending or erect, the later ones much branched, 2.4–5 dm. long. Leaf-blades more or less pubescent, ciliate or puberulent, the hairy ligules about 3 mm. long, rather thin,

flat, 2-7 cm. long, 2-7 mm. wide, the sheaths often nearly glabrous or with some long hairs; panicle 2-8 cm. long, pilose, the branches filiform; spikelets nearly ellipsoid, about 1.3 mm. long, papillose-pubescent, first scale obtuse, about one-fourth the length of the spikelet, the second and third about equal, 7-nerved.

Savannas and hillsides, Porto Rico:—southeastern United States; Cuba.

30. **Panicum acuminatum** Sw. Prodr. 23. 1788.

Panicum ornatum Desv.; Hamilt. Prodr. 11. 1825.

Panicum comophyllum Nash, Bull. Torr. Club 30: 380. 1903.

Culms densely villous, ascending, 7 dm. long or less, the later ones usually branched at most of the nodes, the ultimate branchlets commonly fasciated. Leaves villous or pubescent, or the upper sheaths glabrate, the ligule about 3 mm. long, the blades 4-8 cm. long, 6-13 mm. wide, those of the later branches much smaller; panicle up to 10 cm. long, villous; spikelets obovoid, nearly 2 mm. long, pilose, first scale about one third as long as the spikelet, the second and third strongly nerved. [Referred by Hackel to *P. dichotomum* L.]

Banks at lower and middle elevations in moist districts, Porto Rico:—Jamaica; Cuba; Hispaniola; Colombia.

31. **Panicum scoparium** Lam. Encycl. 4: 744. 1798.

Culms rather stout, densely velvety, branched, erect, ascending or decumbent, up to 1 m. long, the base usually decumbent, the nodes villous with a viscid ring above. Leaf-sheaths velvety or viscid, the blades lanceolate, villous, 2 dm. long or less, 8-15 mm. wide, or those of the branches much smaller; panicle stalked, 6-15 cm. long, viscid, its filiform branches spreading or ascending; spikelets pedicelled, oblong-obovoid, villous, about 2.5 mm. long, pointed; first scale very short, the second and third strongly nerved.

Rocky situations, Sierra de Naguabo:—southeastern United States; Cuba.

Panicum cayennense Lam. is recorded, by Schlechtendal, with doubt, as collected on St. Thomas. We have no evidence of its existence there.

Panicum anceps Michx., of the United States; *P. distachyum* L., of Asia and Australia; and *P. oryzoides* Sw., of tropical America, recorded by Krebs as formerly found in St. Thomas, are, presumably errors for identification.

27. **ICHNANTHUS** Beauv. Agrost. 56. 1812.

Mostly perennial, herbaceous grasses, with flat leaf-blades and panicle, narrow, 1-2-flowered spikelets jointed below the scales. Scales 4, awnless, the first one often as long as the whole spikelet. Lower flower of the spikelet commonly staminate, sometimes wanting, the upper one perfect. Fruiting scale with basal appendages, or in our species with excavations, its back turned toward the rachis of the spikelet. [Greek, vestigial flower.] About 25 species, natives of tropical America. Type species: *Ichnanthus panicoides* Beauv.

Lower scales attenuate-acuminate.	1. <i>I. nemorosus</i> .
Lower scales acute or merely acuminate.	
Leaf-blades lanceolate, glabrous.	2. <i>I. pallens</i> .
Leaf-blades ovate to ovate-lanceolate, often pubescent beneath.	3. <i>I. axillaris</i> .

1. **Ichnanthus nemorosus** (Sw.) Doeli in Mart. Fl. Bras. 2: 289. 1877.

Panicum nemorosum Sw. Prodr. 22. 1788.

Perennial; culms prostrate, often rooting at the nodes, branched, glabrous. Leaf-sheaths glabrous or sparingly pilose or ciliate; blades ovate to lanceolate, somewhat inequilateral, acuminate, glabrous or sparingly pilose; panicles 8 m. long or shorter; lower scales lanceolate, attenuate-acuminate.

Mountain forests of Porto Rico:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.

2. ***Ichnanthus pallens*** (Sw.) Munro; Benth. Fl. Hongk. 414. 1861.

Panicum pallens Sw. Prodr. 23. 1788.

Similar to *I. nemorosus*, the culms more slender and more elongated. Leaf-blades lanceolate, glabrous or sparingly pilose; panicles usually larger; lower scales acute or acuminate, not attenuate.

Shaded banks, forests, woodlands and along streams, Porto Rico, ascending to higher elevations:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America. CARUZO.

3. ***Ichnanthus axillaris*** (Nees) H. & C. Contr. U. S. Nat. Herb. 18: 334. 1917.

Panicum axillare Nees Agrost. Bras. 141. 1829.

Culms commonly shorter than those of either of the two preceding species. Leaves ovate to ovate-lanceolate, usually more or less pubescent at least beneath; lower scales acute or acuminate.

Mountain forests of Porto Rico:—Hispaniola; Tobago; Trinidad; northern South America.

28. **LASIACIS** (Griseb.) Hitchc. Contr. U. S. Nat. Herb. 15: 16. 1910.

Perennial, woody, often elongated and vine-like grasses, with flat leaves, the inflorescence of terminal panicles of large subglobose somewhat oblique 1-flowered spikelets. Scales 4, somewhat coriaceous or chartaceous, not awned, bearing an apical tuft of short hairs. Grain enclosed in the hard fruiting scale and palea. [Greek, hairy-tip.] Ten species or more, of tropical and subtropical America, known as CANE-GRASS. Type species: *Panicum divaricatum* L.

Leaf-blades glabrous.

Leaf-blades linear-attenuate, mostly less than 5 mm. wide.

Leaf-blades lanceolate to linear-lanceolate, mostly 5–20 mm. wide.

Panicles few-flowered, the branches zigzag.

Panicles many-flowered, the branches straight.

Leaf-blades pubescent or puberulent, at least beneath.

Ligule brown, about 2 mm. long; leaves puberulent beneath.

Ligule 1 mm. long or less; leaves velvety-pubescent on both sides.

1. *L. Harrisii*.

2. *L. divaricata*.

3. *L. Sloanei*.

4. *L. ligulata*.

5. *L. sorghoidea*.

1. ***Lasiacis Harrisii*** Nash, Torreyia 13: 274. 1913.

Culms clambering, glabrous, branched, up to 6 m. long, the branches very slender. Leaf-sheaths glabrous or sometimes ciliate; ligule scarious, 1 mm. long or less, blades linear-lanceolate, attenuate, 5–12 cm. long, mostly less than 5 mm. wide, glabrous, rather thin; panicles narrow, few-flowered, short stalked, 3–7 cm. long, the branches few and short; spikelets ellipsoid, about 4 mm. long, the first scale orbicular, about 2 mm. long.

Hillsides, slopes and thickets in moist districts, Porto Rico; St. Jan:—Jamaica.

2. ***Lasiacis divaricata*** (L.) Hitchc. Contr. U. S. Nat. Herb. 15: 16. 1910.

Panicum divaricatum L. Syst. Nat. ed. 10, 871. 1759.

Panicum bambusoides Desv.; Hamilt. Prodr. 10. 1825.

Panicum divaricatum glabrum Kuntze, Rev. Gen. Pl. 784. 1891.

Culm glabrous, smooth, much branched, erect or arching, 2–3 m. long, the branches sometimes pendent. Sheaths ciliate; leaf-blades glabrous, acuminate, those of the main culm 8–12 cm. long, 1–2 cm. wide, those of the branches smaller; panicle 5–10 cm. long, its slender branches spreading or deflexed; spikelets swollen, 4–5 mm. long.

Thickets and woodlands, Porto Rico, ascending to higher elevations; Mona; Muertos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; continental tropical America.

3. **Lasiacis Sloanei** (Griseb.) Hitchc. Bot. Gaz. 51: 302. 1911.*Panicum latifolium* Hamilt. Prodr. 10. 1825. Not L. 1753.*Panicum Sloanei* Griseb. Fl. Br. W. I. 551. 1864.

Culms arching or clambering, glabrous, 2-4 m. long, the branches slender, elongated. Leaf-sheaths glabrous or their margins ciliate; ligule very short; petiole commonly pubescent; blades lanceolate, acuminate, glabrous, thin, 6-15 cm. long, 8-20 mm. wide; panicles 6-20 cm. long, their branches rather widely spreading; spikelets ellipsoid or obovoid, pale, about 4 mm. long.

Dry hillside, Arecibo:—Jamaica; Cuba; Hispaniola; Dominica to Trinidad and South America.

4. **Lasiacis ligulata** H. & C. Contr. U. S. Nat. Herb. 18: 337. 1917.*Panicum divaricatum puberulum* Griseb. Fl. Br. W. I. 551. 1864.

Culms clambering, sometimes attaining a length of 10 meters, and a diameter of 1 cm. toward the base, the slender, widely spreading branches nearly straight. Leaf-sheaths ciliate, otherwise glabrous; ligule brown, about 2 mm. long; blades lanceolate, 12 cm. long or less, 3-15 mm. wide, acuminate, glabrous above, puberulent beneath, roughish-margined; panicles rather loose, 5-10 cm. long, the short slender branches at length reflexed; spikelets obovoid, nearly black when mature, about 4 mm. long.

Hillsides and thickets at lower and middle elevations in moist districts, Porto Rico; St. Thomas; Tortola:—Tobago; Trinidad; Brazil.

5. **Lasiacis sorghoidea** (Desv.) H. & C. Contr. U. S. Nat. Herb. 18: 338. 1917.*Panicum sorghoidea* Desv.; Hamilt. Prodr. 10. 1825.*Panicum Swartzianum* Hitchc. Contr. U. S. Nat. Herb. 12: 140. 1908.*Lasiacis Swartziana* Hitchc. Bot. Gaz. 51: 302. 1911.

Culms arching or clambering, glabrous, 3-7 m. long, the branches slender. Leaf-sheaths velvety-pubescent or glabrate; ligule inconspicuous, 1 mm. long or less; blades lanceolate, velvety-pubescent on both sides, the larger ones 1-2 dm. long, 1-2.5 cm. wide; panicles usually loosely branched and about as broad as long, their slender branches spreading or ascending; spikelets pale, subglobose, about 3 mm. long. [Referred by Urban to *Panicum maculatum* Aubl. (1775) but the identity is doubted.]

Wooded slopes and ravines at middle and higher elevations, Porto Rico; St. Croix; St. Thomas; Virgin Gorda:—Jamaica; Cuba; Antigua to Trinidad and South America.

29. **SACCOLEPIS** Nash in Britton, Man. 89. 1901.

Perennial grasses, with flat leaf-blades and small spikelets in panicles. Spikelets 1-flowered, jointed below the scales. Scales 4, the outer 3 membranous the second one much larger than the others, saccate at the base, many-nerved, the fourth one chartaceous. Stamens 3. Styles distinct; stigmas plumose. [Greek, with reference to the saccate second scale of the spikelet.] A few American species, the following typical.

1. **Sacciolepis striata** (L.) Nash, Bull. Torrey Club 30: 383. 1903.*Holcus striatus* L. Sp. Pl. 1048. 1753.*Panicum striatum* Lam. Tabl. Encycl. 1: 172. 1791.

Culms erect, with a creeping or decumbent base, branched below, 0.6-1.8 m. long. Lower leaf-sheaths hirsute, the upper usually glabrous; blades 7-18 cm.

long, 4–20 mm. wide, pubescent; panicle dense, narrow, 2.5 dm. long or less: spikelets elliptic, 3–4 mm. long.

Wet grounds at lower elevations, Porto Rico;—southeastern United States; Jamaica; Cuba. Reported from Bermuda.

30. **HYMENACHNE** Beauv. *Agrost.* 48. 1812.

Perennial, mostly marsh or aquatic grasses, with flat leaf-blades, and small 1-flowered acuminate spikelets in dense or interrupted spikelike panicles, the very short pedicels jointed below the scales. Scales 4, membranous, all awnless, the second one not inflated, the fruiting one little indurated, open at the summit, not stalked. Styles distinct; stigmas plumose. [Greek, membranous scales.] A few species of tropical and warm-temperate regions. Type species: *Agrostis monostachya* Poir.

1. **Hymenachne amplexicaulis** (Rudge) Nees, *Agrost. Bras.* 276. 1829.

Panicum amplexicaule Rudge, *Pl. Guian.* 1: 21. 1805.

Agrostis monostachya Poir. in *Lam. Encycl. Suppl.* 1: 256. 1810.

Panicum hymenachne Desv. *Opus.* 82. 1831.

Culm erect from a more or less decumbent base, often rooting at the lower nodes, stout, glabrous, 1–2 m. high. Leaf-blades thin, glabrous, lanceolate, long-acuminate, 1–3 dm. long, 1–5 cm. wide, the base cordate-clasping; spike-like panicles elongated, 2–5 dm. long, 8–10 mm. thick, sometimes with a few short branches below; spikelets lanceolate, 4–5 mm. long.

Wet grounds at lower and middle elevations, Porto Rico;—Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; Martinique, Trinidad; continental tropical America and Old World tropics.

31. **ISACHNE** R. Br. *Prodr.* 196. 1810.

Mostly perennial and branching grasses, with flat, conspicuously nerved leaf-blades, the small spikelets paniced, globose or obovoid. Scales 4, not awned, the two lower ones unequal, empty, the third and fourth flowering, both usually with perfect flowers, and forming plano-convex grains which usually remain attached to the minute rachilla. [Greek, similar scales.] About 30 species, tropical and subtropical. Type species: *Isachne australis* R. Br.

1. **Isachne angustifolia** Nash, *Bull. Torrey Club* 30: 377. 1903.

Culms 1 m. long or less, prostrate and branched, often forming large masses, glabrous or slightly pubescent. Leaf-sheaths glabrous or somewhat pubescent; ligule a ring of short hairs; blades 2–10 cm. long, 4–6 mm. wide, rough and green above, smooth and glaucescent beneath; panicles long-stalked, 5–8 cm. long, the branches spreading, puberulent; spikelets about 1.5 mm. long.

Slopes and forest borders at higher elevations, Porto Rico;—Guadeloupe. Referred by Hackel to *I. arundinacea* (Sw.) Griseb. The plant mentioned by Urban under *I. rigidifolia* (Poir.) Urban, is *I. angustifolia*, the only species known in Porto Rico.

Isachne disperma (Lam.) Doell [*I. dubia* Kunth], was recorded by Krebs as formerly found in St. Thomas; it is now known only from the Lesser Antilles from St. Kitt's southward.

32. **OPLISMENUS** Beauv. *Fl. Owar.* 2: 14. 1807.

Perennial grasses, often decumbent and branched at the base, with broad flat leaf-blades and inflorescence composed of spikes, bearing on the lower side scattered clusters of a few spikelets. Spikelets 1-flowered. Scales 4, the 3 outer

membranous, the first and second empty, awned, the first equalling or somewhat shorter than the spikelet, the third scale usually awned, empty, or enclosing a small palet, the fourth one shorter than the others, obtuse, awnless, chartaceous, finally indurated, enclosing a shorter palet of similar texture and a perfect flower. Stamens 3. Styles distinct to the base. Stigmas plumose. [Greek, armed, presumably referring to the awns.] About 4 species, natives of warm regions. Type species: *Oplismenus africanus* Beauv.

1. **Oplismenus hirtellus** (L.) Beauv. Agrost. 54, 168. 1812.

Panicum hirtellum L. Syst. Nat. ed. 10, 870. 1759.

Oplismenus setarius R. & S. Syst. 2: 481. 1817.

Orthopogon loliaceus Spreng. Syst. 1: 306. 1825.

Culms prostrate or nearly so, rooting at the nodes, very slender, 6 dm. long or less. Leaves ovate to ovate-lanceolate, acuminate, 1-6 cm. long, 1 cm. wide or less, their sheaths often pubescent; panicle 8 cm. long or less, its filiform short branches erect or spreading; spikelets 3 mm. long, the awns up to 8 mm. long.

Shaded banks, woodlands and forests, Porto Rico, at lower and middle elevations; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—southern United States; Bermuda; West Indies; continental tropical America. WOOD-GRASS

33. **ECHINOCHLOA** Beauv. Agrost. 53, 161. 1812.

Usually tall grasses, commonly annuals, with broad leaves and a terminal inflorescence consisting of one-sided racemes racemously or paniculately arranged. Spikelets 1-flowered, singly disposed, or in smaller racemes or clusters on the ultimate divisions of the inflorescence. Scales 4, the outer 3 membranous, hispid on the nerves, the third and usually also the second scale awned, or sometimes merely awn-pointed, the awn often very long; fourth scale indurated, shining, frequently pointed, enclosing a palet of similar texture and a perfect flower. Stamens 3. Styles distinct. Stigmas plumose. Grain free. [Greek, in reference to the stout hispid hairs of the spikelets.] Species about 12, mostly in warm and tropical countries. Type species: *Panicum Crus-galli* L.

Annuals; ligule wanting.

Spikelets in about 4 rows; third scale merely tipped, none of them awned.

1. *E. colonum*.

Spikelets irregularly arranged, not in definite rows; third scale awned.

2. *E. Crus-galli*.

Perennial; ligule a dense line of stiff hairs.

3. *E. polystachya*.

1. **Echinochloa colonum** (L.) Link, Hort. Berol. 2: 209. 1833.

Panicum colonum L. Syst. Nat. ed. 10, 870. 1759.

Oplismenus colonus H. B. K. Nov. Gen. 1: 108. 1816.

Annual; culms tufted, smooth and glabrous, 1.5-7.5 dm. tall, often decumbent and rooting at the lower nodes. Sheaths compressed, usually crowded; leaf-blades 2.5-17 cm. long, 2-8 mm. wide; inflorescence composed of 3-18, 1-sided, more or less spreading dense racemes 6-50 mm. long, disposed along a 3-angled rachis and generally somewhat exceeding the length of the internodes; spikelets single, in pairs, or in 3's in rows on one side of the hispidulous, triangular rachis, obovate, pointed, the first scale about one-half as long as the spikelet, 3-nerved, the second and third scales a little more than 2 mm. long, awnless, 5-nerved, hispid on the nerves, the fourth scale cuspidate.

Fields, hillsides, waste and cultivated grounds, Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—West Indies; continental tropical America and Old World tropics. JUNGLE RICE.

2. **Echinochloa Crus-galli** (L.) Beauv. *Agrost.* 53, 161. 1812.

Panicum Crus-galli L. Sp. Pl. 56. 1753.

Oplismenus Crus-pavonis H.B.K. Nov. Gen. 1: 108. 1815.

Panicum sabulicolum Nees, *Agrost. Bras.* 258. 1829.

Panicum Crus-galli sabulicolum Doell in Mart. Fl. Bras. 2^o: 142. 1877.

Echinochloa sabulicolum Hitchc. Contr. U. S. Nat. Herb. 17: 257. 1913.

Annual; culms 6–12 dm. tall, often branching at base. Sheaths smooth and glabrous; leaf-blades 1.5–6 dm. long, 6–25 mm. wide, glabrous, smooth or scabrous; panicle composed of 5–15 sessile, erect or ascending racemes, or the lower branches spreading or reflexed; spikelets ovate, green or purple, densely crowded on one side of the rachis; second and third scales about 3 mm. long, scabrous or hispid, the third scale awned, empty, the fourth ovate, abruptly pointed.

Roadsides and wet waste grounds, Porto Rico:—continental North and South America; Bermuda; Jamaica; Cuba; Guadeloupe; Trinidad; Old World. Consists of several races, differing in length of awns. BARNYARD-GRASS. ARROZILLO.

3. **Echinochloa polystachya** (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 22: 135. 1920.

Oplismenus polystachyus H.B.K. Nov. Gen. 1: 107. 1815.

Echinochloa spectabilis Link, Hort. Berol. 2: 209. 1833.

Perennial; culms commonly clustered, stout, glabrous, 2 m. high or less, the nodes with appressed yellowish hairs. Sheaths glabrous or papillose-hispid; ligule a line of stiff yellow hairs; leaf-blades 7–25 mm. wide, roughish; panicle 1–3 dm. long, scabrous, the racemes several or many, ascending 2–6 cm. long, the rachis scabrous; spikelets somewhat larger than those of *E. Crus-galli*, the third scale with an awn 12 mm. long or less.

Moist or wet grounds at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Antigua; Martinique; Tobago; continental tropical America north to Mexico.

34. **CHAETochLOA** Scribn. Bull. U. S. Dep. Agr. *Agrost.* 4: 38. 1897.

Mostly annual grasses with erect culms and flat leaves, the inflorescence in spike-like clusters. Spikelets 1-flowered, or rarely with a second staminate flower, the basal bristles single or in clusters below the articulation of the rachilla, and therefore persistent. Scales of the spikelet 4, the three outer membranous, the third often subtending a palet and rarely a staminate flower; the inner or fourth scale chartaceous, subtending a palet of similar texture and a perfect flower. Stamens 3. Styles distinct, elongated. Stigmas plumose. Grain free, enclosed in the scales. [Greek, in reference to the bristles of the inflorescence.] Species about 60, in temperate and tropical regions, known as FOXTAIL-GRASS. Type species: *Setaria longisetata* Beauv.

Leaf-blades narrowly elliptic, plaited.

Leaf-blades linear to lanceolate, not plaited.

Bristles subtending the spikelets 5 or more.

Bristles under the spikelets 1–3.

Bristles retrorsely scabrous above; culms clambering.

Bristles antrorsely scabrous; culms erect.

Annual; very large.

Perennials.

Panicle elongated, narrow, attenuate.

Leaf-blades 5–10 mm. wide.

Leaf-blades less than 5 mm. wide.

Panicle broader, not attenuate.

1. *C. barbata*.

2. *C. geniculata*.

3. *C. tenacissima*

4. *C. magna*.

5. *C. setosa*.

6. *C. rariflora*.

7. *C. vulpisetata*.

1. **Chaetochloa barbata** (Lam.) H. & C. Contr. U. S. Nat. Herb. 18: 348. 1917.

Panicum barbatum Lam. Tabl. Encycl. 1: 171. 1791.

Panicum costatum Roxb. Fl. Ind. 1: 314. 1820.

Annual; culms slender, branched, glabrous or somewhat villous, rather weak, 0.5–2 m. long, the base usually decumbent. Leaf-sheaths compressed, glabrous

or villous, the ligule ciliate, the blades narrowly elliptic, plicate, 0.7–2.5 cm. broad; panicle long-stalked, 5–20 cm. long, its branches ascending, sessile; spikelets densely crowded, about 2.5 mm. long, subtended by bristles 5–10 mm. long; first scale circular; second scale ovate; fertile scale transversely rugose.

Vicinity of Mayaguez.—Jamaica; Hispaniola; Antigua to Trinidad; continental tropical America. Naturalized from the Old World tropics. [Recorded by authors as *Panicum flavescens* Sw. MARY GRASS.

2. **Chaetochloa geniculata** (Lam.) Millsp. & Chase, Field. Mus. Bot. 3: 37. 1903.

Panicum geniculatum Lam. Encycl. 4: 727. 1798.

Panicum imberbe Poir. in Lam. Encycl. Suppl. 4: 272. 1816.

Setaria purpurascens H.B.K. Nov. Gen. 1: 110. 1815.

Setaria Ventenatii Kunth, Rev. Gram. 1: 251. 1829.

Chaetochloa imberbis Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Chaetochloa purpurascens Scribn. & Merr. Bull. U. S. Dept. Agric. Div. Agrost. 21: 13. 1900.

Chaetochloa Ventenatii Nash; Kearney, Contr. U. S. Nat. Herb. 5: 515. 1901.

Setaria glauca geniculata Urban, Symb. Ant. 4: 96. 1903.

Setaria glauca purpurascens Urban, loc. cit. 1903.

Perennial; culms 6–12 dm. long, ascending. Sheaths smooth and glabrous, compressed and keeled; leaves 1–3.5 dm. long, 2–6 mm. wide, pale green or glaucous, smooth or nearly so; spike-like panicle long-exserted, rather slender, 2.5–7 cm. long, about 1 cm. thick; spikelets usually single, about 2.5 mm. long and 1.25 mm. wide, the first scale ovate, 3-nerved, about one-half as long as the spikelet, the second scale acute, 3-nerved, the third scale 5-nerved; bristles in two nearly equal clusters of 5 each, very slender, 6–10 mm. long. [*Setaria glauca* of authors, not *Panicum glaucum* L.; ?*Setaria gracilis* of Krebs.]

Banks, hillsides, waste and cultivated grounds, Porto Rico; Mona; Icaos; St. Croix; St. Thomas; St. Jan; Tortola.—eastern United States; West Indies; continental tropical America.

3. **Chaetochloa tenacissima** (Schrad.) H. & C. Contr. U. S. Nat. Herb. 18: 352. 1917.

Setaria tenacissima Schrad.; Schultes, Mant. 2: 279. 1824.

Annual; culms simple or little branched, slender, scabrous above, 0.5–2 m. long, weak and clambering. Leaf-sheaths scabrous above; ligule ciliate; blades 1–2 dm. long, 5–9 mm. wide, scabrous on both sides, pubescent, long-attenuate; panicle narrow, dense, 7–15 cm. long, 1–2 cm. thick, the axis pubescent, the branches short, each ultimate branchlet bearing a bristle about 10 mm. long, retrorsely scabrous above, antrorsely scabrous below; spikelets about 1.5 mm. long; first scale 3-nerved; fertile scale transversely rugose. [Referred by Nash to *C. scandens* and included by Hackel in *Setaria scandens*.]

Slopes near Utuado.—Trinidad; continental tropical America.

4. **Chaetochloa magna** (Griseb.) Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 4: 39. 1897.

Setaria magna Griseb. Fl. Br. W. I. 554. 1864.

Annual; culms erect, branched at the base, stout, tall, 1–4 m. high. Leaf-sheaths compressed, glabrous, the blades 3–6 dm. long, 1–3 cm. wide, scabrate; panicle large, up to 3.5 dm. long, 2–5 cm. thick; spikelets elliptic, acute, about 2 mm. long, subtended by 1–3 upwardly barbed bristles 8–12 mm. long; flowering scale hard, shining, smooth.

On the coast near Humacao and at Laguna de Tortuguero.—southeastern United States; Bermuda (?); Jamaica; Guadeloupe; Panama.

5. *Chaetochloa setosa* (Sw.) Scribn. Bull. U. S. Dep. Agr. Agrost. 4: 39. 1897.

Panicum setosum Sw. Prodr. 22. 1788.

Panicum caudatum Lam. Tabl. Encycl. 1: 171. 1791.

Setaria setosa Beauv. Agrost. 51, 178. 1812.

Panicum paractaenoides Trin. Mem. Acad. St. Petersb. VI. 3^o: 219. 1834.

Setaria paractaenoides Urban, Repert. 15: 98. 1917.

Perennial, tufted; culms wiry, slender, 3-9 dm. high, somewhat flattened. Leaf-blades 2 dm. long or less, pubescent or scabrous, 5-15 mm. wide; inflorescence more or less branched, the branches erect, or ascending, the lower sometimes 3 cm. long; bristles 1-3 at the base of all the spikelets or of some of them, 6-12 mm. long; spikelets ovoid, about 2 mm. long.

Banks and thickets at lower elevations in dry districts, Porto Rico; Desecheo; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—West Indies; continental tropical America; Florida.

The identity of the grass recorded by Hackel as *Setaria scabrifolia* from Guanica (*Sinenis* 3577), has not been ascertained, but *Chaetochloa setosa* is abundant there.

6. *Chaetochloa rariflora* (Mikan) H. & C. Contr. U. S. Nat. Herb. 18: 349. 1917.

Setaria rariflora Mikan; Trin. in Spreng. Neue Entd. 2: 78. 1821.

Perennial; culms tufted, very slender, erect or the base decumbent, 3-6 dm. high. Leaf-blades very narrow, pubescent, mostly less than 5 mm. wide; inflorescence very slender and narrow, 1-1.5 dm. long; bristles usually only 1 at the base of each spikelet, 4-7 mm. long; spikelets about 2 mm. long.

On cliff facing the sea at Boqueron, Porto Rico; St. Croix:—Antigua; Brazil.

7. *Chaetochloa vulpisetata* (Lam.) H. & C. Contr. U. S. Nat. Herb. 18: 350. 1917.

Panicum vulpisetum Lam. Encycl. 4: 735. 1798.

Setaria vulpisetata R. & S. Syst. 2: 495. 1817.

Panicum amplifolium Steud. Syn. Pl. Glum. 1: 53. 1854.

Perennial; culms branched at the base or simple, glabrous, rather stout, 0.5-2 m. high. Leaf-sheaths glabrous or hispidulous; ligule hispid; blades scabrous, 3-5 dm. long, 1.5-3 cm. wide, long-attenuate; panicle dense, narrow, 0.5-3 dm. long, 2-4 cm. thick, narrowed above but not attenuate; bristles 1 or 2 at the base of each spikelet, antrorsely scabrous, 1-2 cm. long; spikelets about 2.5 mm. long, the flowering scale coarsely transversely wrinkled. [Recorded by Hackel as *Setaria macrostachya* H.B.K.]

Bank between Rio Piedras and Trujillo Alto and cultivated at Jayuya:—Tobago; Trinidad; continental tropical America.

Chaetochloa sulcata (Aubl.) Hitchcock, of Tobago, Trinidad and continental tropical America was recorded by Krebs as found in St. Thomas prior to 1851, but the determination is doubted. [*Panicum sulcatum* Aubl.]

35. **PENNISETUM** Pers. Syn. 1: 72. 1805.

Annual or perennial grasses, mostly with flat leaf-blades, the spikelets in usually spike-like panicles. Spikelets lanceolate, involucrate, the involucre a fascicle of short sterile branchlets with few or many antrorsely scabrous or plumose bristles; fascicles falling away with the spikelets attached. First scale minute or obsolete, the second and third few-several-nerved. Stamens 3. Stigmas plumose. Grain compressed. [Greek, feather-bristles.] Eighty species or more, natives of tropical and subtropical regions. Type species: *Holcus spicatus* L.

1. **Pennisetum ciliare** (L.) Link, Hort. Berol. 1: 213. 1827.

Cenchrus ciliaris L. Mant. 302. 1771.

Pennisetum cenchrroides Pers. Syn. 1: 72. 1805.

Perennial; culms tufted or clustered, tough, erect from an ascending base, scabrate above, slender, simple or little branched, 1-5 dm. high. Leaf-sheaths scabrate, usually pilose on the margins, the blades 2-12 cm. long, 3-5 mm. wide, scabrate above, pilose on the margins near the base; panicle 1.5-10 cm. long, purplish; bristles united at the base, the outer short, scabrous, the inner long, flat, ciliate; spikelets 1-5 in the fascicles, about 5 mm. long.

Dry limestone hills near Ponce:—Guatemala. Naturalized from tropical Africa.

Pennisetum purpureum Schum., ELEPHANT GRASS, NAPIER GRASS, African, grown for fodder in Porto Rico and St. Croix, is a tall perennial grass, sometimes 4 m. high, the leaves 2-3 cm. wide, the spikelets purplish, in stiff, dense panicles.

36. **CENCHROPSIS** Nash in Small, Fl. SE. U. S. 109. 1903.

Perennial grasses, with long rootstocks and flat leaves, the spikelets in terminal spikes, each spikelet subtended by an involucre of 1 or 2 outer rows of barbed, thick-based bristles, and 1 or 2 inner rows of barbed spines longer than the bristles, the involucre jointed to the rachis and deciduous. Spikelets of 4 scales, the first and second ones empty, the third enclosing a palet one-half its length or less, the fourth enfolding a similar palet and a perfect flower. Stamens 3. [Greek, resembling *Cenchrus*.] A few species, of tropical America. Type species: *Cenchrus myosuroides* H.B.K.

1. **Cenchropsis myosuroides** (H.B.K.) Nash in Small, Fl. SE. U. S. 109. 1903.

Cenchrus myosuroides H.B.K. Nov. Gen. 1: 115. 1815.

Culms erect, slender, 0.6-1.5 m. tall, simple or branched above, glabrous. Leaves 1-3 dm. long, 3-8 mm. wide, glabrous; spikes 5-20 cm. long; involucre numerous, the barbed spines about 5 mm. long, and about as long as the spikelet.

Waste and cultivated ground, Porto Rico; Mona:—southeastern United States; Bahamas; Cuba; Hispaniola; continental tropical America. SPIKED BUR-GRASS.

37. **CENCHRUS** L. Sp. Pl. 1049. 1753.

Annual or perennial grasses, with usually flat leaves. Inflorescence spike-like. Spikelets subtended by a spiny involucre which is deciduous with them at maturity. Scales 4; the first hyaline; the second and third membranous, the latter sometimes having a palet and staminate flower in its axil; the fourth chartaceous, subtending a palet of similar structure which encloses a perfect flower. Stamens 3. Styles united below. Stigmas plumose. Grain free, enclosed in the scales. [Ancient Greek name for some grass, probably Millet.] About 12 species, in tropical and temperate regions, known as BUR-GRASS. Type species: *Cenchrus echinatus* L.

Involucre 2-spikeleted, armed at the base with commonly shorter often reflexed spines, usually glabrous, or merely puberulent at the base.

Involucre more than 2-spikeleted, armed at the base with barbed bristles.

Spines on the usually 3-spikeleted involucre basal and slender, rarely any above, erect; bristles very slender.

1. *C. carolinianus*.

2. *C. viridis*.

Spines on the usually 4-6-spikeleted involucre not basal but occurring on various parts, spreading or often reflexed; bristles stouter and almost spine-like.

3. *C. echinatus*.

1. **Cenchrus carolinianus** Walt. Fl. Car. 79. 1788.

Culms erect or decumbent from an annual root, 2-9 dm. long. Sheaths usually loose, compressed, smooth; leaves 6-12.5 cm. long; spikes 2.5-6.25 cm. long, sometimes partially included in the upper sheath; involucre crowded on the scabrous rachis, 2-spikeleted, globose, pubescent except at the base, the spines stout; spikelets about 6 mm. long. [Recorded by Krebs, by Nash and by Hackel as *C. tribuloïdes* L.]

Coastal sands, Porto Rico; Mona; Muertos; Vieques; St. Thomas:—United States; Bahamas; Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe.

2. **Cenchrus viridis** Spreng. Syst. 1: 301. 1825.

C. echinatus viridis Spreng.; Griseb. Fl. Br. W. I. 556. 1864.

Culms erect or ascending, usually 6-8 dm. high, branched or simple, the leaf-blades flat, 4 dm. long or less. Spike usually dense and cylindric, 8-12 cm. long and often much exerted; involucre usually 3-spikeleted, armed below with slender spines, the body about 4 mm. in diameter, the barbed bristles slender.

Dry or moist soil and waste grounds at lower elevations, Porto Rico; Muertos; Culebra; Vieques; St. Thomas:—Florida; West Indies; continental tropical America.

3. **Cenchrus echinatus** L. Sp. Pl. 1050. 1753.

Cenchrus brevisetus Fourn. Mex. Pl. 2: 50. 1886.

Culms finally prostrate and rooting at the nodes, branched; leaf-sheaths loose; blades 1-4 dm. long, 5-16 mm. wide, smooth or rough, flat; spikes 3-12 cm. long, finally more or less exerted; involucre 20-50, containing 4-6 spikelets, green to purplish, villous at the base, the spines 3-4 mm. long, the bristles at the base numerous, slender, distinctly barbed for their whole length; spikelets 6-7 mm. long. [*C. echinatus tribuloïdes* of Kuntze.]

Fields and waste grounds at lower elevations, Porto Rico; Mona; Muertos; Icacos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—southern United States; Bermuda; West Indies; continental tropical America and Old World tropics.

Cenchrus parviflorus Poir., described as from Porto Rico, is not understood by modern botanists.

38. **STENOTAPHRUM** Trin. Fund. Agrost. 175. 1820.

Perennial creeping branched grasses, with rather stout flattened culms and short linear leaves. Spikelets spicate or paniced, acute, mostly 2-flowered, imbedded in depressions on one side of the flattened rachis. Scales 4; first scale small or minute, second about as long as the spikelet, third similar to the second, subtending a staminate flower, fourth rigid, enclosing a perfect flower. Stigmas plumose. [Greek, a narrow depression.] A few species of tropical and subtropical distribution, the following typical.

1. **Stenotaphrum secundatum** (Walt.) Kuntze, Rev. Gen. pl. 794. 1891.

Ischaemum secundatum Walt. Fl. Car. 249. 1788.

Rottboellia stolonifera Poir. in Lam. Encycl. 6: 310. 1804.

Stenotaphrum glabrum Trin. Fund. Agrost. 176. 1820.

Stenotaphrum americanum Schrank, Hort. Monac. pl. 98. 1822.

Widely creeping, sometimes 5 m. long, glabrous, rooting at the lower nodes. Leaf-sheaths keeled, flattened, the blade linear, 3–15 cm. long, 4–10 mm. wide, blunt and rounded at the apex; spikelets about 6 mm. long, in spikes 4–13 cm. long.

Moist banks and sandy soil at lower elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—southeastern United States; Bermuda; West Indies; continental tropical America and Old World tropics. GRAMA BLANCA. RUNNING CRAB-GRASS. ST. AUGUSTINE GRASS. Valuable as a lawn-grass. A handsome variegated race with white banded leaves was seen in cultivation at the Insular Experiment Station, Rio Piedras, in 1923, and also in St. Croix.

39. **OLYRA** L. Syst. ed. 10, 1261. 1759.

Tall, perennial, monoecious grasses, with broad, flat leaves and terminal panicles of large, 1-flowered spikelets. Pistillate-flowered spikelets borne on the upper branches and at the ends of the lower branches of the panicle. Staminate-flowered spikelets smaller than the pistillate, deciduous, borne on the lower branches of the panicle. First scale of the pistillate spikelet wanting; second and third scales long-acuminate. Grain hard. [Greek, of little value.] Several species of tropical distribution, the following typical.

1. **Olyra latifolia** L. Syst. ed. 10, 1261. 1759.

Olyra arundinacea H.B.K. Nov. Gen. 1: 197. 1816.

Culm smooth, rather stout, usually branched below, elongated, sometimes up to 5 m. long, the lower sheaths bladeless. Leaf-blades nearly sessile, lanceolate to ovate-lanceolate, acuminate at the apex, rounded or obtuse and oblique at the base, many-nerved, 2 dm. long or less, 2–5 cm. wide, the upper ones smaller than the lower; panicles 1–1.5 dm. long; pistillate spikelets, including the prolongation of the scales, 1.5–2.5 cm. long; staminate spikelets narrow, 1 cm. long or less, of but one, usually awned scale.

Woodlands and shaded thickets at lower and middle elevations in moist or wet districts, Porto Rico; Vieques; St. Thomas; St. Jan (ex Eggers); Tortola;—Florida; Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; tropical America. CARUZILLO.

40. **LITHACHNE** Beauv. Agrost. 135. 1812.

Monoecious, perennial grasses, with flat leaf-blades and small axillary or axillary and terminal panicles of rather large, 1-flowered spikelets. Terminal panicle when present, wholly of staminate-flowered spikelets; axillary panicles with one pistillate-flowered spikelet at the end, and one or several staminate ones below. First scale wanting; second and third scales long-acuminate; fruiting-scale horny. Staminate spikelets much reduced. [Greek, hard scales.] Several species of tropical distribution, the following typical.

1. **Lithachne pauciflora** (Sw.) Beauv.; Poir. Diet. Sci. Nat. 27: 60. 1823.

Olyra pauciflora Sw. Prodr. 21. 1788.

Culms slender, glabrous, usually clustered, naked below, several-leaved above, 2–5 dm. high. Leaf-blades obliquely lanceolate or ovate-lanceolate, nearly sessile, 3–8 cm. long, 1–3 cm. wide, the apex acuminate, the base sub-truncate; panicles small, of few spikelets, borne in the upper axils; pistillate spikelets 1–2 cm. long; staminate spikelets early deciduous, much smaller than the pistillate; grain white, obliquely obovoid, compressed, shining, about 4 mm. long.

Woodlands in moist or wet districts, Porto Rico;—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Martinique; St. Vincent; continental tropical America.

41. **PHARUS** P. Br.; L. Syst. ed. 10, 1269. 1759.

Large perennial grasses with very broad, flat, petioled leaf-blades, the monoecious spikelets in a terminal panicle. Spikelets jointed below the scales in pairs on the panicle-branches, one sessile, with a pistillate flower, the other short-stalked, staminate, much smaller. Scales 3, the 2 lower ones membranous, empty, the third in the pistillate spikelet flowering and fruiting, longer than the empty ones, narrow, nearly closed by involute margins. Stamens 6. Styles filiform; stigmas papillose. [Greek, a cloak.] About 5 species, natives of tropical America known as LAMBEDORA. Type species: *Pharus latifolius* L.

Culms erect or erect-ascending.

Fruit a little longer than the lower scales, pubescent at the tip.

1. *P. latifolius*.

Fruit much longer than the lower scales, pubescent all over.

2. *P. glaber*.

Culms creeping at the base.

3. *P. parvifolius*.

1. **Pharus latifolius** L. Syst. ed. 10, 1269. 1759.

Pharus ovalifolius Desv.; Hamilt. Prodr. 8. 1825.

Erect-ascending, glabrous, up to 1 m. long. Leaf-sheaths longer than the internodes; petioles 1-5 cm. long; blades obovate, oblanceolate or elliptic, dark green, acute, 1-2 dm. long, 3-6 cm. wide; panicle 2 dm. long or less; pistillate spikelet 8-10 mm. long, the fruiting scale a little longer than the 2 empty ones, pubescent near the tip, glabrous below; staminate spikelet 3-5 mm. long.

Woodlands at middle altitudes in moist or wet districts, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America. Recorded from St. Thomas by Krebs, apparently erroneously.

2. **Pharus glaber** H.B.K. Nov. Gen. 1: 196. 1816.

Pharus brasiliensis Raddi, Agrost. Bras. 21. 1823.

Pharus lancifolius Desv.; Hamilt. Prodr. 8. 1825.

Similar to *P. latifolius*, about as large, the leaf-blades averaging a little narrower; panicles sometimes smaller; fruiting scale 2 to 3 times as long as the 2 empty ones, pubescent all over.

Woods and forests in moist districts, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Florida; Jamaica; Cuba to Barbados and St. Vincent; continental tropical America.

3. **Pharus parvifolius** Nash, Bull. Torrey Club 35: 301. 1908.

Culms creeping, branching, rooting at the lower nodes, up to 1 m. long, pubescent at least above. Leaves glabrous, the sheaths overlapping; petioles 1-1.5 cm. long; blades elliptic-lanceolate, 6-12 cm. long, 1.5-3 cm. wide, acuminate; panicle small, usually long-stalked; pistillate spikelet 10-12 mm. long, the fruiting scale about twice as long as the empty ones, pubescent.

Woodlands, Jobo near Arecibo:—Cuba; Hispaniola; Jamaica; Trinidad. Included by Hackel in *P. glaber* H.B.K.

42. **ORYZA** [Tourn.] L. Sp. Pl. 333. 1753.

Marsh grasses, with erect culms, flat leaf-blades and rather large, 1-flowered spikelets in terminal panicles. Spikelets flattened, jointed below the scales; scales 4, the 2 outer ones small, empty, the 2 inner keeled, awned or awnless, the fourth enclosing a perfect flower without a pale. Stamens 6. Styles nearly distinct; stigmas plumose. [Greek, rice.] About 6 species of warm temperate and tropical regions. Type species: *Oryza sativa* L.

Leaves 5-15 mm. wide.

1. *O. sativa*.

Leaves 2-5 cm. wide.

2. *O. latifolia*.

1. *Oryza sativa* L. Sp. Pl. 333. 1753.

Annual, with coarse fibrous roots; culm simple, 5-12 dm. high, glabrous. Leaf-sheaths long, smooth or nearly so, the blades scabrous, elongated, 5-15 mm. wide; panicle narrow, 1-3 dm. long, its branches slender and nearly erect; spikelets oblong, 8-10 mm. long, the third and fourth scales hispidulous, the fourth one awned or awnless, the 2 lower empty ones subulate, glabrous.

Waste grounds and spontaneous after cultivation, Porto Rico; St. Thomas;—spontaneous after cultivation in warm-temperature and tropical regions. Native of the East Indies. RICE. ARROZ.

2. *Oryza latifolia* Desv. Journ. de Bot. 1: 77. 1813.

Perennial; culm stout, glabrous, simple, 2-2.5 m. tall. Leaf-sheaths elongated, smooth or scabrate, the blades 3-6 dm. long, 2-5 cm. wide, scabrous; panicles large, up to 4 dm. long, with many spikelets on the upper parts of the elongated ascending branches; spikelets oblong, about 6 mm. long, the third and fourth scales hispid, the upper one long-awned, the 2 lower ones subulate.

Along a stream, Mayaguez;—Hispaniola; Trinidad; continental tropical America. Native of the Old World tropics.

43. **HOMALOCENCHRUS** Mieg. in Soc. Phys.-med. Basil, Act. Helv. 4: 307. 1760.

Mostly marsh grasses with flat narrow, generally rough leaves and paniculate inflorescence. Spikelets 1-flowered, perfect, strongly flattened laterally, and usually more or less imbricated. Scales 2, chartaceous, the outer one broad and strongly conduplicate, the inner much narrower. Stamens 1-6. Styles short, distinct. Stigmas plumose. Grain ovoid, free. [Greek, in reference to the supposed resemblance of these grasses to Millet.] About 5 species, natives of temperate and tropical countries.

Panicle narrow, its branches spikelet-bearing nearly to the base; spikelets hispidulous. 1. *H. hexandrus*.
Panicle open, its branches spreading, naked below; spikelets glabrous. 2. *H. monandrus*.

1. **Homalocenchrus hexandrus** (Sw.) Kuntze, Rev. Gen. Pl. 777. 1891.

Leersia hexandra Sw. Prodr. 21. 1788.

Perennial; culms slender, weak, 6-20 dm. long, rooting at the lower nodes. Leaves scabrous, the blades 5-20 cm. long, 8 mm. wide or less. Panicle narrow, 4-8 cm. long, its branches ascending, bearing spikelets along nearly their whole length; spikelets oblong, about 4 mm. long and 1.5 mm. wide, the scales scabrate on the keel, hispidulous on the sides; stamens 6.

Marshes at lower elevations, Porto Rico;—southern United States; Jamaica; Cuba; Hispaniola; Martinique; Trinidad; continental tropical America.

2. **Homalocenchrus monandrus** (Sw.) Kuntze, Rev. Gen. Pl. 777. 1891.

Leersia monandra Sw. Prodr. 21. 1788.

Perennial; culms tufted, erect or ascending, 4-6 dm. high. Leaf-sheaths glabrous, smooth, the blades scabrate, 4-16 cm. long, 2-5 mm. wide; panicle open, 7-13 cm. long; spikelets about 2 mm. long and 1 mm. wide. elliptic, glabrous; stamen only 1.

Woodlands in dry parts of the southern and southwestern districts of Porto Rico;—Florida; Jamaica; Cuba; Hispaniola; continental tropical America.

44. **ARISTIDA** L. Sp. Pl. 82. 1753.

Grasses varying greatly in habit and inflorescence. Leaves narrow, often involute-setaceous. Spikelets narrow, 1-flowered. Scales 3, narrow, the two outer carinate; the third rigid and convolute, bearing three awns occasionally united at the base, the lateral awns rarely wanting or reduced to rudiments. Palea 2-nerved. Stamens 3. Styles distinct. Stigmas plumose. Grain free, tightly enclosed in the scale. [Latin, from *arista*, an awn.] About 100 species, in the warmer regions of both hemispheres, known as TRIPLE-AWNED GRASS. Type species: *Aristida adscensionis* L.

Annual.

Perennials.

- Panicle dense, spike-like; neck of the fruit long, twisted.
 Panicle not spike-like; neck of the fruit short or wanting.
 Awns 2-2.5 cm. long.
 Awns 1.5 cm. long or less.
 Culms spreading; spikelets clustered.
 Culms erect or ascending.

1. *A. adscensionis*.
 2. *A. spiciformis*.
 3. *A. portoricensis*.
 4. *A. cognata*.
 5. *A. refracta*.

1. **Aristida adscensionis** L. Sp. Pl. 82 1753.

Aristida bromoides H.B.K. Nov. Gen. 1: 121. 1815.

Aristida stricta Griseb. Fl. Brit. W. I. 534. 1834. Not Michx. 1803.

Annual, tufted, glabrous; culms slender, erect, or ascending, 3-7 dm. long, branching from the lower nodes. Leaf-blades thin, flat or involute; panicles narrow, 1.5 dm. long or less, with short appressed branches or the lower branches spreading; awns about equal in length, 12-20 mm. long.

Coastal plains in the dry southwestern districts, Porto Rico; Mona; St. Croix; St. Thomas; St. Jan; - Bahamas; Jamaica; Hispaniola; Antigua; Montserrat; Gaudeloupe; Martinique; Bonaire; Curacao; Ascension; southern United States and Mexico to continental tropical America. [A. *dispersa* of authors, not of Trinius & Ruprecht; erroneously referred by Pilger to *A. americana* L.]

2. **Aristida spiciformis** Ell. Bot. S. C. & Ga. 1: 141. 1816.

Perennial, glabrous; culms clustered, simple, 4-10 dm. high, stiff, erect. Leaf-blades 2-3 mm. wide, involute in drying; panicle dense, narrow, 10-20 cm. long; central awn 2.5-3.5 cm. long, the lateral ones a little shorter, the two united below into a twisted column 1.5-2.5 cm. long, forming the neck of the fruit.

In white sand, Campo Alegre;—southeastern United States; Isle of Pines.

3. **Aristida portoricensis** Pilger in Urban, Symb. Ant. 4: 100. 1903.

Perennial; culms tufted, very slender, erect, glabrous, 3-5 dm. high, simple or little branched. Leaf-blades setaceous, 8 cm. long or less, erect or nearly so; panicle open, its filiform branches spreading or ascending; awns 2-2.5 cm. long, the neck of the fruit short.

Red clay slopes, Monte Mesa and serpentine slopes, Guanajibo. Endemic.

4. **Aristida cognata** Trin. & Rupr. Mem. Acad. St. Petersburg. VI. Sci. Nat. 5¹: 127. 1842.

Aristida Swartziana Steud. Syn. Pl. Glum. 1: 137. 1854.

Perennial; culms slender, tufted, spreading, 3-6 dm. tall. Leaves involute-filiform, the upper shorter; panicle strict, or the top sometimes nodding, its short branches ascending; awns 1-2 cm. long, horizontal when old, nearly equal in length.

Rocky soil, Boqueron, Porto Rico, (ex Hitchcock & Chase); St. Croix; St. Thomas;—Bahamas; Jamaica.

5. *Aristida refracta* Griseb. Cat. Pl. Cub. 228. 1866.

Perennial, densely tufted; culms nearly filiform but stiff, erect, simple or branched below, 3-5 dm. high. Leaves filiform-setaceous, 10 cm. long or less, erect; panicle rather narrow, its branches ascending; awns 10-12 mm. long.

Serpentine slopes, Guanajibo, and near Boqueron:—Jamaica; Cuba.

Aristida capillacea Lam., East Indian, and *A. plumosa* L., Mediterranean, recorded by Krebs from St. Thomas are, presumably, errors in determination.

45. **MUHLENBERGIA** Schrob.; Gmel. Syst. Nat. 2: 171. 1791.

Mostly perennial grasses, with flat or convolute leaves and paniculate inflorescence. Rootstocks often scaly. Spikelets 1-flowered, very rarely 2-flowered. Scales 3, very rarely 4; the outer ones empty, membranous or hyaline, acute and sometimes awned; third scale 3-5-nerved, subtending a palea and perfect flower, obtuse, acute, or very often produced into a capillary awn; palea 2-keeled. Stamens often 3. Style distinct. Stigmas plumose. Callus minute. Grain narrow, free, tightly enclosed in the scale. [In honor of Henry Muhlenberg, 1756-1817, North American botanist.] About 60 species, chiefly natives of America, a few Asiatic. Type species: *Muhlenbergia Schreberi* Gmel.

1. *Muhlenbergia capillaris* (Lam.) Trin. Gram. Unifl. 191. 1824.

Stipa capillaris Lam. Tabl. Encycl. 1: 158. 1791.

Culms 4.5-12 dm. tall, erect, simple, smooth or nearly so. Sheaths smooth, the lower short and overlapping, the upper ones much longer; leaves 1.5-3 dm. long, 2-4 mm. wide, scabrous; panicle 1.75-3 dm. in length or more, diffuse, the capillary branches 1-2 dm. long, at length widely spreading; spikelets on long hair-like pedicels which are clavate-thickened at the apex; outer scales unequal, acute or short-awned, slightly scabrous; third scale, exclusive of the awn, 4 mm. long, about twice as long as the first one, the awn 6-18 mm. long.

Top of limestone cliff west of the junction of Rio Arecibo and Rio Limon, and near the Arecibo-Lares road:—United States; Bahamas; Cuba. HAIR GRASS. PURPLE GRASS.

Muhlenbergia tenuissima Kunth, of Central America was recorded by Krebs from St. Thomas, presumably in error.

46. **SPOROBOLUS** R. Br. Prodr. 169. 1810.

Perennial or rarely annual grasses, with flat or convolute leaves and open or contracted panicles. Spikelets generally small, 1-flowered, occasionally 2-3-flowered. Scales in the 1-flowered spikelets 3, membranous; the 2 outer empty, the first somewhat shorter; the third scale equalling or longer than the empty ones; palea 2-nerved. Stamens 2-3. Styles very short, distinct. Stigmas plumose. Grain free, and often early deciduous. [Greek, referring to the deciduous grain.] About 100 species, in tropical and temperate regions, very numerous in America. Type species: *Agrostis indica* L.

Annual.

Perennials.

Plants with long rootstocks.

Plants without rootstocks.

Second scale much shorter than the spikelet.

Panicle loose; second scale about one-fourth as long as the spikelet.

Panicle dense; second scale about one-half as long as the spikelet.

Second scale about as long as the spikelet.

Panicle ovoid; spikelets about 1.5 mm. long.

Panicle elongated, dense; spikelets 2-4 mm. long.

Panicle green; spikelets 2 mm. long.

Panicle purple; spikelets 4 mm. long.

1. *S. muralis*.

2. *S. virginicus*.

3. *S. indicus*.

4. *S. Berteroanus*.

5. *S. argutus*.

6. *S. domingensis*.

7. *S. cubensis*.

1. *Sporobolus muralis* (Raddi) H. & C. Contr. U. S. Nat. Herb. 18: 368. 1917.

Agrosticula muralis Raddi, Agrost. Bras. 33. 1823.

Annual, glabrous, 3-8 dm. high; culms very slender, flattened, erect or ascending. Leaf-blades nearly linear, 2-3 mm. wide; panicle large, sometimes 3 dm. long, loose, with capillary ascending branches; spikelets long-stalked, about 1 mm. long, glabrous, the scales acute.

Waste grounds, St. Croix; Tortola:—Martinique; St. Lucia. Native of Brazil. [*Sporobolus minutiflorus* of Millspaugh, not of Link.]

2. *Sporobolus virginicus* (L.) Kunth, Rev. Gram. 1: 67. 1829.

Agrostis virginica L. Sp. Pl. 63. 1753.

Agrostis littoralis Lam. Tabl. Encycl. 1: 161. 1791.

Sporobolus littoralis Kunth, Rev. Gram. 1: 68. 1829.

Culms 1.5-6 dm. tall, erect or decumbent, from a stout creeping rootstock. Sheaths numerous, short, overlapping and crowded at the lower part of the culm, smooth, glabrous or sometimes pilose on the margins and at the throat; leaves 2.5-20 cm. long, 4 mm. wide or less at the base, distichous, involute on the margins and at the apex, smooth beneath, scabrous above or sometimes sparingly hairy; panicle 2.5-7.5 cm. long, 4-10 mm. thick, dense and spike-like; spikelets 2-2.5 mm. long, the outer scales about equal, acute, smooth and glabrous; third scale smooth and glabrous acute, slightly shorter than the second and about equalling the obtuse palea. [?S. *trcmulus* of Krosb.]

Saline soil along the coasts, Porto Rico; Desecheo; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Aneгада:—eastern and southern United States; Bermuda; West Indies; continental tropical America. SEA-SHORE RUSH-GRASS.

3. *Sporobolus indicus* (L.) R. Br. Prodr. 170. 1810.

Agrostis indica L. Sp. Pl. 63. 1753.

Agrostis tenacissima L. f. Suppl. 107. 1781.

Sporobolus Jacquemontii Kunth, Rev. Gram. 2: 427. 1831.

Glabrous. Culms 3-12 dm. tall, erect, tufted; leaves 2-6 mm. wide, attenuate into a long slender tip, the lower 2-3 dm. long, the upper shorter; panicle 1-4 dm. in length, usually elongated, narrow, spike-like; spikelets 1.5-2 mm. long, the outer scales unequal, the second about one-third as long as the third, obtuse, smooth and glabrous, the lower one shorter, and often erose-truncate.

Dry soil, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; Mexico to northern South America. WEST INDIAN RUSH-GRASS. SERRILLO.

4. *Sporobolus Berteroanus* (Trin.) H. & C., Contr. U. S. Nat. Herb. 18: 370. 1917.

Vilfa Berteroana Trin. Mem. Acad. St. Petersburg. VI. Sci. Nat. 4¹: 100. 1840.

Sporobolus angustus Buckley, Proc. Phila. Acad. 1862: 88. 1862.

Slender, wiry, 1 m. tall or less. Leaves smooth, nearly erect, 1-3 mm. wide, long-attenuate, the lower ones 1.5-2.5 dm. long, the upper shorter; panicle narrow, often 3 dm. long; spikelets about 3 mm. long, crowded on the short appressed branches of the panicle; second scale ovate-oblong, about one half as long as the spikelet.

Wet ground, and shaded slopes, ascending to 800 m. in Porto Rico; Vieques; St. Croix; St. Jan; Tortola:—southern United States; Bermuda; West Indies; Mexico to northern South America. BULL-GRASS.

5. *Sporobolus argutus* (Nees) Kunth, Enum. 1: 215. 1833.

Vilfa arguta Nees, Agrost. Bras. 395. 1829.

Perennial; culms 3 dm. tall or less, erect, or somewhat decumbent at the base. Sheaths shorter than the internodes, their margins sometimes hirsute at the top; leaves 2.5-5 cm. long, 2-4 mm. wide at the base, acuminate, smooth and glabrous

beneath, scabrous, and often sparingly hairy at the base above; panicle 3.75–7.5 cm. in length, the branches 1.25–2.5 cm. long, verticillate, at first appressed, finally widely spreading; spikelets 1.5 mm. long; outer scales smooth and glabrous, the first rounded or obtuse, one-quarter the length of the acute second one; third scale about equalling the second, acute.

Sandy and saline soil along the coasts and along Lake Guanica, Porto Rico; Mona; Muertos; St. Croix; Anegada:—southwestern United States; Bahamas; Jamaica; Cuba; Hispaniola; Antigua; Trinidad; Bonaire; Curacao; Mexico to northern South America.

6. **Sporobolus domingensis** (Trin.) Kunth, Enum. 1: 214. 1833.

Vilfa domingensis Trin.; Spreng. Neue Entdeck. 2: 59. 1821.

Perennial, similar to *S. argutus*, but usually larger, the culms up to 4 dm. long, the panicle densely many-flowered, narrow, 9 cm. long or less, its branches 2–1 cm. long. Spikelets 2 mm. long; first scale about one-half as long as second.

Sandy soil, Cabo Rojo:—Florida; Bahamas; Cuba; Hispaniola. The Cabo Rojo specimen is immature and the determination doubtful.

7. **Sporobolus cubensis** Hitchc. Contr. U. S. Nat. Herb. 12: 237. 1909.

Perennial; culms clustered, glabrous, erect, slender, 3–6 dm. high. Leaf-sheaths long-ciliate, the blades of the lower ones elongated, sometimes as long as the culm, flat or involute, 3 mm. wide or less, strongly nerved, long-ciliate at the base; upper leaves much smaller; panicle 6–10 cm. long, its short branches opposite or whorled; spikelets glabrous, about 4 mm. long, short-stalked; lower scale 1.5–2 mm. long. [Referred by Nash and by Hackel to *S. purpurascens* (Sw.) Hamilt.]

Slopes of Monte Mesa:—Cuba. CUBAN DROP-SEED GRASS.

Sporobolus pungens Kunth, of southern Europe, was recorded from St. Thomas by Krebs, presumably in error.

47. **AVENA** [Tourn.] L. Sp. Pl. 79. 1753.

Annual or perennial grasses, with usually flat leaves and paniced spikelets. Spikelets 2–many-flowered, or rarely 1-flowered; lower flowers perfect, the upper often staminate or imperfect. Scales 4–many (rarely 3); the two lower empty, somewhat unequal, membranous, persistent; flowering scales deciduous, rounded on the back, acute, generally bearing a dorsal awn, the apex often 2-toothed. Palet narrow, 2-toothed. Stamens 3. Styles short, distinct. Stigmas plumose. Grain oblong, deeply furrowed, enclosed in the scale and palet, free or sometimes adherent to the latter. [Old Latin name for the oat.] About 50 species, widely distributed in temperate regions, chiefly in the Old World, the following typical.

1. **Avena sativa** L. Sp. Pl. 79. 1753.

Annual, glabrous; culm erect, 1 m. high or less. Leaf-blades 2–3 dm. long, 7–12 mm. wide, acuminate; panicle 1–2 dm. long, its very slender branches ascending; spikelets filiform-stalked, 1.5–2.5 cm. long, the empty scales broad, acute, the flowering scales awnless or short-awned.

Waste grounds, San Juan:—widely cultivated in temperate regions. Native of the Old World. OATS. AVENA.

48. **SPARTINA** Schreb.; Gmel. Syst. 123. 1791.

Perennial glabrous grasses, with long horizontal rootstocks, flat or involute leaves, and an inflorescence of one-sided spreading or erect alternate spikes. Spikelets 1-flowered, narrow, deciduous, borne in two rows on the rachis, artic-

ulated with the very short pedicels below the scales. Scales 3; the two outer empty, keeled, very unequal; the third subtending a perfect flower, keeled, equalling or shorter than the second; palet often longer than its scale, 2-nerved. Stamens 3. Styles filiform, elongated. Stigmas filiform, papillose or shortly plumose. Grain free. [Greek, referring to the cord-like leaves of some species.] About 7 species, widely distributed in saline soil, rarely in fresh-water marshes. Type species: *Spartina Schreberi* Gmel.

1. **Spartina patens** (Ait.) Muhl. Gram. 55. 1817.

Dactylis patens Ait. Hort. Kew 1: 104. 1789.

Spartina juncea Willd. Enum. 81. 1809.

Culms 3-9 dm. tall, erect, or decumbent at base, smooth. Leaves 1.5-3 dm. long, 2-4 mm. broad, involute, attenuate into a long tip, smooth and glabrous beneath; spikes 2-10, 2.5-5 cm. long, usually ascending, more or less peduncled, the rachis slightly scabrous; spikelets 6-8 mm. long; outer scales acute, scabrous, hispid on the keel, the first usually rather less than one-half as long as the second; third scale somewhat scabrous on the upper part of the keel, emarginate or 2-toothed at the apex, longer than the first and exceeded by the palet.

Coastal rocks and banks, Porto Rico; Icacos; Vieques; Virgin Gorda (barren);—eastern United States; Bermuda; Bahamas; Jamaica; Guadeloupe; Martinique. SALT GRASS.

49. **CAPRIOLA** Adans. Fam. Pl. 2: 31. 1763.

Perennial grasses with short flat leaves and spicate inflorescence, the spikes digitate. Spikelets 1-flowered, secund. Scales 3; the 2 lower empty, keeled; flowering scale broader, membranous, compressed; palet a little shorter than the scale, hyaline, 2-keeled. Stamens 3. Styles distinct. Stigmas short, plumose. Grain free. [Name mediaeval Latin for the wild goat, that feeds on this grass in waste rocky places.] Four known species, of which three are Australian, the following typical one widely distributed.

1. **Capriola Dactylon** (L.) Kuntze, Rev. Gen. 764. 1891.

Panicum Dactylon L. Sp. Pl. 58. 1753.

Cynodon Dactylon Pers. Syn. 1: 85. 1805.

Culms 1-3 dm. tall, erect, from long creeping and branching stolons, smooth and glabrous. Sheaths glabrous or somewhat hairy, crowded at the bases of the culms and along the stolons; leaves 2.5-5 cm. long, 2-4 mm. wide, flat, scabrous above; spikes 4 or 5, digitate, 1-5 cm. long, the rachis flat; spikelets 2 mm. long; outer scales hispid on the keel, narrow, the first shorter than the second.

Hillsides and banks at lower elevations, Porto Rico, especially in dry districts; St. Croix; St. Thomas; St. Jan; Tortola;—southern and central United States; Bermuda; West Indies; continental tropical America; warm-temperature and tropical regions of the Old World. BERMUDA GRASS. GRAMA.

50. **CHLORIS** Sw. Prod. 25. 1788.

Mostly perennial grasses with flat leaves and spicate inflorescence, the spikes few or numerous, verticillate or approximate. Spikelets 1-flowered, arranged in two rows on one side of the rachis. Scales 4; the 2 lower empty, unequal, keeled, acute; third and fourth usually awned, the former subtending a perfect flower; palet folded and 2-keeled. Stamens 3. Styles distinct. Stigmas plumose. Grain free, enclosed in the scale. [Greek, greenish-yellow, referring to the color

of the herbage.] About fifty species, mostly natives of warm and tropical regions.

Type species: *Agrostis cruciata* L.

Hairs on the margins or nerves of the third scale short, not manifest, appressed to and not extending beyond the apex.

Fourth scale of the spikelet at least one third as long as the second scale and bearing a long awn 4 mm. long or more; spikes 4-6, widely spreading at maturity.

Fourth scale of the spikelet rudimentary, bearing an awn less than 4 mm. long; spikes usually numerous, erect or ascending at maturity.

Hairs on the margins or nerves of the third scale long, manifest, widely spreading or extending much beyond the apex.

Third and fourth scales only awned, the former densely long-hairy on the midnerve, its awn less than twice the length of the scale.

Third, fourth and fifth scales awned, the first glabrous on the midnerve, its awn about three times the length of the scale.

1. *C. Sagraeana*.

2. *C. radiata*.

3. *C. ciliata*.

4. *C. paraguayensis*.

1. **Chloris Sagraeana** A. Rich. in Sagra, Hist. Cub. 11: 315. 1850.

Chloris cleusinoides Griseb. Fl. Brit. W. I. 539. 1864.

Perennial; culms ascending, 6 dm. long or less, usually branched below. Leaf-sheaths keeled, the blades narrow, involute; spikes 4-6, slender, 4-8 cm. long, horizontally spreading when old, not pectinate; spikelets imbricated, the fourth scale bearing a filiform awn 4-12 mm. long.

Dry soil, St. Croix:—Bahamas; Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe. This is, perhaps, the grass recorded by Krebs from St. Thomas as *C. cruciata*.

2. **Chloris radiata** (L.) Sw. Prodr. 26. 1788.

Agrostis radiata L. Pl. Jam. Pugil. 7. 1759.

Annual; culms decumbent, ascending or erect, 2-4 dm. long, usually branched, smooth and slender. Leaf-sheaths compressed, the blades flat, blunt or short-pointed, 2-15 cm. long; spikes several or many, radiating, slender, 4-8 cm. long, not pectinate; spikelets densely imbricated, the fourth scale rudimentary, bearing a filiform awn about 3 mm. long.

Hillsides, banks, ditches and waste grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; continental tropical America. PLESH-GRASS. HORQUETILLO.

3. **Chloris ciliata** Sw. Prodr. 25. 1788.

Annual; culms decumbent, ascending or nearly erect, rather stiff, 8 dm. long or less, smooth, mostly simple. Leaf-sheaths somewhat compressed, the blades flat, long-acuminate, 7-20 cm. long; spikes few, stout, radiate, pectinate, 4-7 cm. long, commonly curved; spikelets pale, approximate, the third and fourth scales short-awned.

Dry and brackish soil near Tallaboa, Porto Rico; St. Croix; St. Thomas:—southern United States; Bahamas; Jamaica; Cuba; Hispaniola; Antigua to Grenada; continental tropical America.

4. **Chloris paraguayensis** Steud. Syn. Pl. Gram. 204. 1854.

Chloris barbata Sw. Fl. Ind. Occ. 1: 200. 1797. Not *Andropogon barbatum* L. 1759.

Annual; culms decumbent, ascending or erect, 3-6 dm. long, slender, smooth. Leaf-sheaths compressed, the blades flat or folded, long-acuminate, 4-12 cm. long. Spikes few or numerous, radiate, pectinate, 4-8 cm. long; spikelets usually purple, the third, fourth and fifth scales filiform-awned.

Waste and cultivated grounds, Porto Rico; Mona; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—West Indies; continental tropical America; Old World tropics.

51. **EUSTACHYS** Desv. Nouv. Bull. Soc. Philom. 2: 188. 1810.

Perennial grasses, with flat or folded, usually obtuse leaf-blades, and spicate inflorescence, the spikes single, in pairs or 3—many and digitate. Spikelets usually 1-flowered, rarely 2-flowered, sessile, crowded in 2 rows. Scales 4, rarely 5, the 2 lower empty, persistent, unequal, keeled, the first generally acute, the second oblong, truncate or 2-lobed at the apex, short-awned, the others awnless, mucronate, or short-awned, firmer than the empty scales, the third scale enclosing a perfect flower and a palet, the fourth scale empty, or rarely enclosing a staminate flower. [Greek, beautiful spikes.] About 6 species, natives of tropical America, the following typical.

1. **Eustachys petraea** (Sw.) Desv. Nouv. Bull. Soc. Philom. 2: 189. 1810.

Chloris petraea Sw. Prodr. 25. 1788.

Chloris Swartziana Duell, in Mart. Fl. Bras. 2^o: 68. 1878.

Culms 3—11 dm. tall; leaves 3 dm. long or less, 10 mm. wide or less, smooth; spikes 3—11, usually 4—6, erect, 4—11 cm. long; spikelets about 2 mm. long; scales 4, the second, exclusive of the awn, 1.5—1.75 mm. long, 2-toothed at the apex, the teeth triangular, acute or obtusish, the awn about 0.5 mm. long; third scale about 2 mm. long, in side view elliptic and about 1 mm. wide, the awn short or wanting; fourth scale, in side view, obovate-elliptic, rounded at the apex, awnless.

Sandy soil along and near the coasts, Porto Rico; Mona; Vieques:—Florida; Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America. FINGER-GRASS.

52. **GYMNOPOGON** Beauv. Agrost. 41. 1812.

Annual or perennial grasses with flat and usually short rigid leaves, and numerous slender alternate or digitate spikes. Spikelets 1-flowered, almost sessile, the rachilla extended and bearing a small scale which is usually awned. Scales 3 or 4; the 2 lower empty, unequal, narrow, acute; third broader, fertile, 3-nerved, slightly 2-toothed at the apex, bearing an erect awn; the fourth empty, small, awned; palet 2-keeled. Stamens 3. Styles distinct. Stigmas plumose. Grain linear, free, enclosed in the rigid scale. [Greek, naked-beard, referring to the prolongation of the rachilla.] Six known species, all but one of them natives of America. Type species: *Andropogon ambiguus* Michx.

1. **Gymnopus foliosus** (Willd.) Nees, Agrost. Bras. 426. 1829.

Chloris foliosa Willd. Sp. Pl. 4: 924. 1806.

Annual; culms branched near the base or tufted, erect or ascending, with erect branches, slender, glabrous, 1.5—5 dm. high, the internodes short. Leaf-sheaths with a row of long hairs at the mouth, the blades short, tapering from the base to the apex, glabrous, 1—2.5 cm. long, 1—2 mm. wide; spikes 4—8, digitate at the end of a long, very slender stalk, 2—4.5 cm. long, the upper scales of the spikelets filiform-awned.

In white sand, Campo Alegre, Porto Rico; St. Thomas:—Hispaniola; northern South America. The type locality is St. Thomas.

53. **ELEUSINE** Gaertn. Fruct. & Sem. 1: 7. 1788.

Tufted annual or perennial grasses, with flat leaves and spicate inflorescence, the spikes digitate or close together at the summit of the culm. Spikelets several-flowered, sessile, closely imbricated in two rows on one side of the rachis, which is

not extended beyond them; flowers perfect or the upper staminate. Scales compressed, keeled; the 2 lower empty; the others subtending flowers, or the upper empty. Stamens 3. Styles distinct. Stigmas plumose. Grain loosely enclosed in the scale and palet. [From the Greek name of the town where Ceres was worshipped.] Species 6, natives of the Old World. Type species: *Cynosurus coracana* L.

1. **Eleusine indica** (L.) Gaertn. Fruct. & Sem. 1: 8. 1788.

Cynosurus indicus L. Sp. Pl. 72. 1753.

Andropogon repens Schoepf, Reise 2: 493. 1788.

Culms 1.5–6 dm. tall, tufted, erect, or decumbent at the base. Sheaths loose, overlapping and often short and crowded at the base of the culm, glabrous or sometimes sparingly villous; leaves 7.5–30 cm. long, 2–6 mm. wide, smooth or scabrous; spikes 2–10, 2.5–7.5 cm. long, whorled or approximate at the summit of the culm or one or two sometimes distant; spikelets 3–6-flowered, 3–4 mm. long; scales acute, minutely scabrous on the keel, the first 1-nerved, the second 3–7-nerved, the others 3–5-nerved.

Waste and cultivated grounds, a troublesome weed, Porto Rico; Mona; Icaos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—temperate and tropical regions of the Old World and the New. Native of the Old World. WIRE-GRASS. YERBA DULCE. PATA DE GALLINA.

54. **DACTYLOCTENIUM** Willd. Enum. Hort. Berol. 1029. 1809.

An annual grass, with flat leaves and spicate inflorescence, the spikes in pairs or digitate. Spikelets several-flowered, sessile, closely imbricated in two rows on one side of the rachis, which is extended beyond them into a sharp point. Scales compressed, keeled, the 2 lower and the uppermost ones empty, the others subtending flowers. Stamens 3. Styles distinct, short. Stigmas plumose. Grain free, rugose, loosely enclosed in the scale. [Greek, referring to the digitately spreading spikes.] A monotypic genus of the warmer parts of the Old World.]

1. **Dactyloctenium aegyptium** (L.) Willd. Enum. Hort. Berol. 1029. 1809.

Cynosurus aegyptius L. Sp. Pl. 72. 1753.

Culms 1.5–6 dm. long, usually decumbent and extensively creeping at the base. Sheaths loose, overlapping and often crowded, smooth and glabrous; leaves 1.5 dm. in length or less, 2–6 mm. wide, smooth or rough, sometimes pubescent, ciliate toward the base; spikes in pairs, or 3–5 and digitate, 1.25–5 cm. long; spikelets 3–5-flowered; scales compressed, scabrous on the keel, the second awned, the flowering ones broader and pointed.

Waste and cultivated grounds, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—southern United States; West Indies; tropical continental America; warm-temperate and tropical regions of the Old World. EGYPTIAN GRASS.

55. **BOUPELOUA** Lag. Varied. Cienc. 2^o: 134. 1805.

Annual or perennial grasses with flat or convolute leaves and numerous spikelets in few one-sided spikes. Spikelets 1–2-flowered, arranged in two rows on one side of a flat rachis, the rachilla extended beyond the base of the flowers, bearing 1–3 awns and 1–3 rudimentary scales. Two lower scales empty, acute, keeled; flowering scale broader, 3-toothed, the teeth awn-pointed or awned;

palet hyaline, entire or 2-toothed. Stamens 3. Styles distinct. Stigmas plumose. Grain oblong, free. [In honor of Claudian Boutelou, a Spanish botanist.] About 36 species, particularly numerous in Mexico and in the southwestern United States, known as MESQUITE-GRASS. Type species: *Bouteloua racemosa* Lag.

Second flower a rudimentary 3-fld awn.

Leaf-blades up to 10 cm. long; spikes 2-3 cm. long.

Leaf-blades only 2 cm. long or less; spikes about 0.5 cm. long.

Second flower well developed.

1. *B. americana*.

2. *B. juncea*.

3. *B. heterostega*.

1. ***Bouteloua americana*** (L.) Scribn. Proc. Phila. Acad. 1891: 306. 1891.

Aristida americana L. Syst. Nat. ed. 10, 879. 1759.

Bouteloua litigiosa Lag. Gen. & Sp. Nov. 5. 1816.

Perennial, tufted. Culms wiry, compressed, decumbent or ascending, 7 dm. long or less, often much branched, glabrous. Leaves involute-margined, hairy near the base, 6-10 cm. long, 2 mm. wide or less; raceme open, composed of several spike-like branches 2-3 cm. long; spikelets about 7 on each spike, appressed; second flower rudimentary, with 3 awns of about equal length.

Sandy fields and roadsides near the southern and western coasts, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Bahamas; Jamaica; Cuba; Hispaniola; Antigua to Tobago; continental tropical America.

2. ***Bouteloua juncea*** (Desv.) Hitchc. Contr. U. S. Nat. Herb. 17: 343. 1913.

Triathera juncea Desv.; Beauv. Agrost. 40. 1812.

Perennial; culms glabrous, very slender, prostrate or ascending, branched, 5-15 cm. long, the branches often fasciated or densely tufted, the flowering ones filiform, erect, 6-15 cm. high. Leaf-sheaths pilose at the mouth, the blades 15 mm. long or less, 1-1.5 mm. wide, glabrous, folded, at least in drying; racemes of few or several minute spikes; spikelet solitary, pilose at the base, about 4 mm. long, the scales lanceolate, acuminate, the second flower of 3 slender scabrous awns.

Red soil, coastal plain near Guanica;—Hispaniola.

3. ***Bouteloua heterostega*** (Trin.) Griffiths, Contr. U. S. Nat. Herb. 14: 414. 1912.

Entriana heterostega Trin. Gram. Unifl. 242. 1824.

Bouteloua Humboldtiana Griseb. Mem. Am. Acad. II. 8: 532. 1862.

Heterosteca rhadina Nash, Bull. Torrey Club 30: 386. 1903.

Perennial; culms prostrate, ascending or erect, branched, glabrous, slender, 2-6 dm. long. Leaves more or less pilose, the blades 2-8 cm. long, 1-2.5 mm. wide, folded, at least when dry; racemes 2-10, ascending or spreading, 1.5-3 cm. long; spikelets 4-7, about 12 mm. long, the second flower staminate, the other perfect or pistillate, its scale long-awned.

Rocky and sandy soil at lower and middle elevations, Porto Rico, mostly in dry districts;—Cuba; Hispaniola; Martinique.

56. **LEPTOCHLOA** Beauv. Agrost. 71. 1812.

Usually tall annual or perennial grasses, with flat leaves and numerous spikes forming a simple panicle. Spikelets usually several-flowered, flattened, alternating in two rows on one side of the rachis. Scales 4 to many; the 2 lower empty, keeled, shorter than the spikelet; the flowering scales keeled, 3-nerved. Palet

2-nerved. Stamens 3. Styles distinct. Stigmas plumose. Grain free, enclosed in the scale and palet. [Greek, in allusion to the slender spikes.] About 12 species, natives of the warmer regions of both hemispheres. Type species: *Cynosurus virgatus* L.

Perennial.

1. *L. virgata*.

Annuals.

Sheaths, or the upper ones hispid.
Sheaths glabrous.

2. *L. filiformis*.
3. *L. scabra*.

1. **Leptochloa virgata** (L.) Beauv. Agrost. 71, 166. 1812.

Cynosurus virgatus L. Syst. Nat. ed. 10, 876. 1759.

Perennial; culms rather slender, smooth, erect or decumbent, somewhat tufted, 2-10 dm. high, little branched or simple. Leaf-sheaths glabrous, the blade 6-18 cm. long, 4-15 mm. wide; spikes slender, weak, 3-12 cm. long, racemose near the top of the culm; spikelets about 4 mm. long; flowering scales awnless or very short-awned. [*L. virgata gracilis* of Eggers.]

Wet and waste grounds, Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—West Indies; continental tropical America.

2. **Leptochloa filiformis** (Lam.) Beauv. Agrost. 166. 1812.

Festuca filiformis Lam. Tabl. Encycl. 1: 191. 1791.

Eleusine mucronata Michx. Fl. Bor. Am. 1: 65. 1803.

Leptochloa mucronata Kunth, Rev. Gram. 1: 91. 1829.

Annual; culms 3-12 dm. high, finally branching. Leaf-sheaths usually hispid or hirsute, the blades 6-25 cm. long, 1 cm. wide or less, scabrous; spikes ascending, 5-15 cm. long; spikelets about 3 mm. long. [*L. mucronata multiflora* of Eggers.]

Fields and cultivated grounds at lower elevations, Porto Rico; along ditches, St. Croix (according to Eggers).—southern United States; Bermuda; West Indies; continental tropical America.

3. **Leptochloa scabra** Nees, Agrost. Bras. 435. 1829.

Annual; culms about 1 m. high, or less, rather stout, usually simple. Leaf-sheaths glabrous but scabrate, the blades 6-20 cm. long, mostly less than 1 cm. wide; spikes 4-8 cm. long, ascending or nearly erect, numerous, forming an elongated, narrow inflorescence; spikelets secund, 3-4 mm. long.

Wet grounds at lower elevations, Porto Rico.—southern United States; Tobago; Trinidad; continental tropical America.

57. **DIPLACHNE** Beauv. Agrost. 80. 1812.

Tufted grasses, with narrow flat leaves and long slender spikes arranged in an open panicle, or rarely only one terminal spike. Spikelets several-flowered, narrow, sessile or rarely pedicelled, erect. Two lower scales empty, membranous, keeled, acute, unequal; flowering scales 1-3-nerved, 2-toothed and mucronate or short-awned between the teeth. Palet hyaline, 2-nerved. Stamens 3. Styles distinct. Stigmas plumose. Grain free, loosely enclosed in the scale and palet. [Greek, referring to the 2-toothed flowering scales.] About 15 species, natives of the warmer regions of both hemispheres, the following typical.

1. **Diplachne fascicularis** (Lam.) Beauv. Agrost. 160. 1812.

Festuca fascicularis Lam. Tabl. Encycl. 1: 189. 1791.

Leptochloa fascicularis A. Gray, Man. 588. 1848.

Culms tufted, finally branching, 3-8 dm. tall. Leaves erect, 1-2 dm. long, 3 mm. or less wide, involute when dry, rough; racemes 8 or more, erect or ascending, the larger ones 4-8 cm. long; spikelets 4-8 mm. long; scales 10-12, the flowering scales, exclusive of the awn, 3-4 mm. long, the midnerve extending into an awn 1 mm. long or less.

In a ditch, St. John's Estate, St. Croix:—United States; Bahamas; Jamaica; Cuba; Mexico; South America. SPIKE-GRASS.

58. **PAPPOPHORUM** Schreb.; Vahl, Symb. 3: 10. 1794.

Mostly perennial, tufted, large or small grasses, the narrow leaf-blades often convolute in drying, the 1-3-flowered spikelets in dense spike-like, simple or branched panicles. Spikelets jointed above the 2 lower empty scales, the 1 or 2 lower flowers perfect, the upper one staminate. Lower empty scales membranous, persistent, the flowering ones and the upper barren ones subcoriaceous, cleft at the apex into numerous slender awns, forming a pappus-like crown, which falls away with the grain. [Greek, pappus, bearing.] Twenty species or more, mostly tropical, the following typical.

1. **Pappophorum alopecuroideum** Vahl, Symb. 3: 10. 1794.

Pappophorum laguroideum Schrad.; Schultes, Mant. 2: 342. 1824.

Culms densely tufted, stiff, erect, glabrous, 6-15 dm. tall. Leaves elongated, about 4 mm. wide, strongly convolute in drying, glabrous, light green; panicle 1-4 dm. long, silvery-bristly, its branches erect-appressed; awns soft, nearly filiform, 8-10 mm. long.

On a limestone bench, Punta Aguila, Porto Rico; Desecheo; Mona; St. Thomas:—Cuba; St. Eustatius; Guadeloupe; Dominica; Martinique; Trinidad; continental tropical America; Jamaica?

59. **GYNERIUM** H. & B. Pl. Aequin. 2: 112. 1812.

Tall, perennial, dioecious grasses, the culms stout, somewhat woody below, the leaf-blades large and flat, the spikelets in a large terminal panicle. Spikelets several-flowered, jointed above the lower scales. Scales membranous or hyaline, narrow, the 2 lower ones empty; flowering scales of the pistillate spikelets long-hairy, those of the staminate spikelets glabrous. Stamens 3. Styles distinct; stigmas plumose. Grain oblong, free, nearly terete, not grooved. [Greek, referring to the hairy pistillate scales.] A few species of tropical America, the following typical.

1. **Gynerium sagittatum** (Aubl.) Beauv. Agrost. 138. 1812.

Saccharum sagittatum Aubl. Pl. Guian. 1: 50. 1775.

Gynerium saccharoides H. & B. Pl. Aequin. 2: 112. 1812.

An immense grass, sometimes reaching 10 m. in height, the old leaf-sheaths persistent below. Leaf-blades up to 2 m. long, 4-7 cm. wide, long-acuminate, serrulate, those of the staminate plant approximate under the panicle which is often 1 m. long, its axis erect, the branches drooping, the pistillate panicle very silky.

River-banks at lower elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America. UVA GRASS. WILD CANE. CAÑA DE CASTILLA. CAÑA DE LA INDIA. The leaves are used in basketry

60. **ARUNDO** [Scheuch.] L. Sp. Pl. 81. 1753.

Tall, perennial grasses, with stout somewhat woolly culms, broad and flat leaf-blades and large panicles of spikelets. Spikelets 2-many-flowered, the internodes of the rachilla glabrous; scales 4 to many, the empty lower ones narrow, the flowering ones broader, hairy on the back. Stamens 3. Styles distinct; stigmas plumose. [Name said to be derived from the Celtic for water.] About 6 species, natives of the Old World, the following typical.

1. **Arundo Donax** L. Sp. Pl. 81. 1753.

Culms erect, 3-8 m. high. Leaf-blades up to 1 m. long, 5-8 cm. wide; panicle terminal, 5-10 dm. long, the spikelets numerous and crowded.

Wet grounds near Ponce and Guanica; Vieques:—southern United States; Bermuda; Jamaica; Cuba; Antigua to Barbados. Much planted for ornament. Native of the Old World. GIANT REED. COW CANE. CAÑA GUANA.

61. **PHRAGMITES** Trin. Fund. Agrost. 134. 1820.

Tall, perennial reed-like grasses, with broad flat leaves and ample panicles. Spikelets 3-several-flowered, the first flower often staminate, the others perfect; rachilla articulated between the flowering scales, long-pilose. Two lower scales empty, unequal, membranous, lanceolate, acute, shorter than the spikelet; the third scale empty or subtending a staminate flower; flowering scales glabrous, narrow, long-acuminate, much exceeding the short palets. Stamens 3. Styles distinct, short. Stigmas plumose. Grain free, loosely enclosed in the scale and palet. [Greek referring to its hedge-like growth along ditches. Three known species, the following typical one widely distributed, one in Asia the third in South America.

1. **Phragmites Phragmites** (L.) Karst. Deutsch. Fl. 379. 1881.

Arundo Phragmites L. Sp. Pl. 81. 1753.

Phragmites communis Trin. Fund. Agrost. 134. 1820.

Culms 1.5-5 m. tall, erect, stout, from long horizontal rootstocks, smooth and glabrous. Sheaths overlapping, loose; blades 1.5-3 dm. long or more, 8-50 mm. wide, flat, smooth, glabrous; panicle 1.5-3 dm. long or more, ample; spikelets crowded on the ascending branches; first scale 1-nerved, half to two-thirds as long as the 3-nerved second one; flowering scales 1-1.2 cm. long, 3-nerved, long-acuminate, equalling the hairs of the rachilla.

River-banks, marshes and lake-borders at lower elevations, Porto Rico:—north temperate zone; Bahamas; Jamaica; Hispaniola; Guadeloupe; Martinique; Tobago; Mexico. REED-GRASS. WILD CANE.

62. **ERAGROSTIS** Host, Ic. Gram. Austr. 4: 14. 1809.

Annual or perennial grasses, rarely dioecious, from a few inches to several feet in height, the spikelets in panicles. Spikelets 2-many-flowered, more or less flattened. Two lower scales empty, unequal, shorter than the flowering ones, keeled, 1-nerved, or the second 3-nerved; flowering scales membranous, keeled, 3-nerved; palets shorter than the scales, prominently 2-nerved or 2-keeled, usually persisting on the rachilla after the fruiting scale has fallen. Stamens 2 or 3. Styles distinct, short. Stigmas plumose. Grain free, loosely enclosed in the scale and palet. [Greek, etymology doubtful, perhaps signifying a low

grass, or Love-grass, an occasional English name.] A genus of about 100 species, widely distributed throughout all warm and temperate countries, known as LOVE-GRASS. Type species: *Briza Eragrostis* L.

Palets glabrous on the keel, or merely hispidulous.

Spikelets dioecious; creeping grass.

Spikelets all alike; plants not creeping.

Annuals; low.

Spikelets small, about 1.5 mm. wide.

Spikelets larger, about 2 mm. wide.

Spikelets ovate, 6 mm. long or less.

Spikelets linear, 7-10 mm. long.

Perennial; tall.

Palets long-ciliate on the keel.

Spikelets 2 mm. long.

Spikelets 3-4 mm. long.

1. *E. hypnoides*.

2. *E. pilosa*.

3. *E. tephrosanthos*.

4. *E. Barrelieri*.

5. *E. Elliottii*.

6. *E. amabilis*.

7. *E. ciliaris*.

1. *Eragrostis hypnoides* (Lam.) B. S. P. Prel. Cat. N. Y. 69. 1888.

Poa hypnoides Lam. Tabl. Encycl. 1: 185. 1791.

Poa reptans Michx. Fl. Bor. Am. 1: 69. 1803.

Eragrostis reptans Nees, Agrost. Bras. 514. 1829.

Culms 2.5-45 cm. long, extensively creeping, branched, the branches erect or ascending, 2.5-15 cm. high. Sheaths villous at the summit; leaf-blades 5 cm. long or less, 1-2 mm. wide, flat, smooth beneath, rough above; spikelets dioecious, 10-35-flowered, 4-16 mm. long; lower scales unequal, the first one-half to two-thirds as long as the second; flowering scales about 2.5 mm. long, the lateral nerves prominent; scales of the pistillate flowers more acute than those of the staminate.

Banks, roadsides and muddy places at lower and middle elevations, Porto Rico:—Cuba; Hispaniola; Martinique; Trinidad; temperate and tropical continental North and South America.

2. *Eragrostis pilosa* (L.) Beauv. Agrost. 162. 1812.

Poa pilosa L. Sp. Pl. 68. 1753.

Annual; culms 1.5-4.5 dm. tall, tufted, erect, slender, branched. Sheaths sometimes pilose at the throat; leaf-blades 2.5-12.5 cm. long, 2 mm. wide or less, smooth beneath, scabrous above; panicle 5-15 cm. in length, the branches at first erect, finally widely spreading, 2.5-3.75 cm. long, often hairy in the axils. spikelets 5-12-flowered, 3-6 mm. long, about 1.5 mm. wide; lower scales acute, the first one-half as long as the second; flowering scales acute, the lower 1.5 mm. long, thin, usually purplish.

Fields, roadsides and waste grounds, Porto Rico; St. Croix; St. Thomas:—United States; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America; warm-temperate and tropical regions of the Old World.

3. *Eragrostis tephrosanthos* Schult. Mant. 2: 316. 1824.

Annual; culms tufted, slender, erect or ascending, 1-3 dm. high, glabrous. Leaf-blades 4-8 cm. long, 1.5-3 mm. wide, glabrous or nearly so, the sheath ciliate at the top; panicle open, 4-8 cm. long, its filiform branches spreading or ascending; spikelets filiform-peduncled, ovate to ovate-lanceolate, 4-7 mm. long, about 2 mm. wide; scales and palet glabrous.

Banks, fields, roadsides and in cultivated grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas:—West Indies; northern South America. Doubtfully referred by Nash to *E. Purshii* Schrad.

4. *Eragrostis Barrelieri* Desv., Journ. de Bot. 8: 289. 1894.

Annual; culms tufted, glabrous, ascending or erect, 5 dm. high or less. Leaf-blades 4-9 cm. long, 3-6 mm. wide, scabrous above; panicle open, 1-2 dm. long or shorter, its filiform branches ascending; spikelets linear, 8-12 mm. long. [*E. minor* of Millspaugh, not of Host; *E. poaeoides* of Eggers, not of Beauvois.]

Dry soil, St. Croix; St. Thomas (ex Eggers):—Texas. Native of the Old World.

5. *Eragrostis Elliottii* S. Wats. Proc. Am. Acad. 25: 140. 1890.

Poa nitida Ell. Bot. S. C. & Ga. 1: 162. 1817. Not Lam. 1791.

Eragrostis macropoda Pilger, in Urb. Symb. Ant. 4: 106. 1903.

Perennial; culms tufted, glabrous, rather slender, erect, 4–10 dm. high. Sheaths glabrous; leaf-blades 1–4 dm. long, 3–5 mm. wide, scabrous above; smooth beneath; panicle 2–5 dm. long, open, its nearly filiform branches spreading or ascending; pedicels filiform, much longer than the spikelets; spikelets 6–13-flowered, 5–10 mm. long, the flowering scales about 2 mm. long.

Moist sandy soil near the northern and western coasts of Porto Rico; St. Thomas:—southeastern United States; Bahamas; Jamaica; Cuba; Hispaniola.

6. *Eragrostis amabilis* (L.) W. & A.; H. & A. Bot. Beechey Voy. 251. 1841.

Poa amabilis L. Sp. Pl. 68. 1753.

Poa plumosa Retz. Obs. 4: 20. 1786.

Eragrostis plumosa Link, Hort. Berol. 1: 192. 1827.

Annual; culms slender, densely tufted, erect or ascending, 1–4 dm. high. Sheaths commonly with a tuft of hairs at the top, their margins usually ciliate; leaf-blades 2–10 cm. long, 4 mm. wide or less; panicle-branches spreading or ascending; spikelets about 2 mm. long, 4–8-flowered, the palea ciliate with very short hairs.

Waste and cultivated grounds at lower elevations, Porto Rico; St. Jan:—southeastern United States; Bahamas; Jamaica; Cuba; St. Kitts to Trinidad. Naturalized from the Old World tropics.

7. *Eragrostis ciliaris* (L.) Link, Hort. Berol. 1: 192. 1827.

Poa ciliaris L. Syst. Nat. ed. 10, 875. 1759.

Annual; culms densely tufted, slender, erect or ascending, 3 dm. high or less; leaf-sheaths with a tuft of hairs at the top and usually ciliate, the blades flat, 2–7 cm. long, 2–5 mm. wide; panicle narrow, dense, 2–10 cm. long, its branches appressed; spikelets 3–4 mm. long, 6–16-flowered; palea-nerve long-ciliate.

Sandy soil, waste and cultivated grounds at lower elevations, Porto Rico; Mona; Muertos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—southern United States; Bermuda; West Indies; continental tropical America and Old World tropics. Consists of several races. Specimens from Anegada recorded by Britton as *E. Urbaniana* Hitchc., a closely related species, now appear better referable to *E. ciliaris*. Specimens from Morillos de Cabo Rojo, Porto Rico, closely approach *E. arabica*.

63. **UNIOLA** L. Sp. Pl. 71. 1753.

Erect and often tall grasses with flat or convolute leaves and paniculate inflorescence. Spikelets 3–many-flowered, flat, 2-edged, the flowers perfect, or the upper staminate. Scales flattened, keeled, sometimes winged, rigid, usually acute; the lower 3–6 empty, unequal; the flowering scale many-nerved, the uppermost scales often smaller and empty; palea rigid, 2-keeled. Stamens 1–3. Styles distinct. Stigmas plumose. Grain compressed, free, loosely enclosed in the scale and palea. [Name diminutive of *unus*, one, of no obvious application.] About 8 species, natives of America. Type species: *Uniola paniculata* L.

2. *Uniola virgata* (Poir.) Griseb. Fl. Brit. W. I. 531. 1864.

Poa virgata Poir. in Lam. Encycl. 5: 78. 1804.

Uniola racemiflora Trin. Bull. Acad. St. Petersb. 1: 68. 1836.

Culms tufted, 1–2 m. tall, rigid. Leaves 3–5 dm. long, rigid, involute, usually curved, 2–3 mm. wide; panicle narrow, virgate, 2–5 dm. long, about 2 cm. thick, its many short branches erect, appressed, the spikelets racemose-

spiculate, secund, 3-4 mm. long, oval, few-flowered; flowering scales about 2 mm. long.

Coastal rocks, southwestern districts, Porto Rico; Vieques; St. Thomas; Little St. James:—Bahamas; Jamaica; Cuba; Hispaniola; Saba.

64. **ARTHROSTYLIDIUM** Rupr. Mem. Acad. St. Petersb. VI. 5²: 117. 1839.

Woody, mostly vine-like grasses, the leaves usually borne on short branches whorled at the nodes, the leaf-blades linear or lanceolate, jointed with the sheaths. Spikelets racemose, usually appearing only after long intervals, sometimes only after many years. Spikelets linear, few-several-flowered, stalked or nearly sessile, more or less secund, articulated above the lower 3 or 4 empty scales; lowest scale small, the others similar to each other, acute or acuminate, many-nerved, not awned; paleas narrow, 2-carinate, scarcely shorter than the scales. Flowers perfect. Stamens 3. Ovary glabrous; styles 2. Grain oblong. [Greek referring to the jointed spikelets.] About 20 species, natives of tropical America. Known as Cakoncillas. Type species: *Arthrostylidium Hacnkei* Rupr.

Leaf-blades nearly capillary, involute in drying, 1-3 mm. wide.

Leaf-blades flat, not involute.

Young branches retrorse-scabrous; leaf-blades 10-15 mm.

wide.

Young branches smooth; leaf-blades 3-5 mm. wide.

1. *A. capillifolium*.

2. *A. multispicatum*.

3. *A. sarmentosum*.

1. **Arthrostylidium capillifolium** Griseb. Mem. Am. Acad. II. 8: 531. 1862.

Arundinaria capillifolia Hack. Oest. Bot. Zeitschr. 53: 69. 1903.

Glabrous; stem slender, wiry, woody, climbing over shrubs and small trees, sometimes 5 m. long, often forming large colonies. Branches numerous, fasciated at the nodes, short; leaves capillary, flexible, 5-15 cm. long; spikelets few, at the ends of the branches, lanceolate, 8-12 mm. long, 2-3 mm. wide, several-flowered.

Woods and thickets near Maricao and Sabana Grande, Porto Rico; Vieques; St. Thomas; St. Jan:—Bahamas; Cuba; Hispaniola. OLD MAN'S BEARD.

2. **Arthrostylidium multispicatum** Pilger in Urban, Symb. Ant. 2: 341. 1901.

Arundinaria multispicata Hack. Oest. Bot. Zeitschr. 53: 69. 1903.

High-climbing; main branches elongated, when young retrorse-scabrous, the older branches smooth; ultimate branchlets verticillate, 15-30 cm. long; leaf-blades 6-8 cm. long, 10-15 mm. wide, or larger on strong shoots; racemes terminal and axillary, numerous, the axis straight, the glabrous spikelets appressed.

Mountain forests, central and western districts of Porto Rico:—Cuba; Hispaniola. FOREST CLIMBING BAMBOO.

3. **Arthrostylidium sarmentosum** Pilger in Urban, Symb. Ant. 4: 108. 1903.

Climbing on trees and shrubs, the culm and branches very slender, smooth, the ultimate branchlets 10-15 cm. long, in dense, distant verticils. Leaf-blades pale green, flat, 5 cm. long or less, 3-5 mm. wide; racemes many, terminal and axillary, zigzag, composed of few pubescent spikelets.

Mountain forests at higher elevations, Porto Rico:—Cuba; Hispaniola. FOREST CLIMBING BAMBOO.

65. **CHUSQUEA** Kunth, Syn. Pl. Aequin. 1: 254. 1822.

Climbing or clambering woody grasses, with elongated, branched culms, small leaves, the blades jointed with the sheaths, the small 1-flowered spikelets in terminal panicles, the flowers perfect. Scales 5, the two lower ones small,

empty, persistent, the next two appressed, the flowering one membranous. Stamens 3. Styles distinct or united. Grain oblong. [Colombian name.] About 35 species of tropical America. Type species: *Chusquea scandens* Kunth.

1. **Chusquea abietifolia** Griseb. Fl. Br. W. I. 529. 1864.

Arundinaria (?) *microclada* Pilger in Urban, Symb. Ant. 5: 289. 1907.

Climbing on trees and shrubs, slender, much-branched, the culms elongated, often drooping, sometimes 6-7 meters long, the ultimate branchlets verticillate, numerous, 6-10 cm. long. Leaves rather rigid, narrowly lanceolate, 1.5-5 cm. long, spinulose-tipped, the margins scabrate; panicles terminating leafy branchlets; spikelets few, lanceolate, pointed, about 6 mm. long, short-stalked.

Hillsides, Monte Alegre and near Yauco:—Jamaica; Hispaniola. The grass flowers only after long intervals and dies after flowering.

66. **BAMBOS** Retz. Obs. 5: 24. 1789.

Woody grasses, with erect, hollow, jointed, branching culms, flat leaf-blades jointed with their sheaths, and several-many-flowered spikelets clustered in narrow or broad panicles, the panicle-branches often verticillate. Scales several or numerous, awnless, the lower 1 to 4 empty, shorter than the flowering ones. Stamens 6. Style undivided or 2-3-cleft. Grain oblong. [Indian name.] Forty species or more, natives of warm-temperate and tropical parts of the Old World. Type species: *Bambos arundinacca* Retz.

1. **Bambos vulgaris** Schrad.; Wendl. Coll. Pl. 2: 26. 1810.

Culms stout, 15 m. high or less, about 1 dm. in diameter, the lateral branches numerous, slender, the nodes with a line of hairs. Leaf-sheaths loosely pubescent, the blades lanceolate, 1.5-2.5 dm. long, 4 cm. wide or less; flowering branches clustered; spikelets 1-2 cm. long in bracted clusters of 3-10, oblong, pointed, the empty scales ovate, acute, many-nerved.

Moist grounds and along water-courses at lower elevations, Porto Rico; St. Croix, St. Thomas:—Widely naturalized in the West Indies and in continental tropical America from the Old World tropics. BAMBOO. BAMBU.

A low arching slender Bamboo was seen at Agricultural Experiment Station, Mayaguez, in 1923. Krebs records the East Indian *B. arundinacca* Willd., as formerly grown in St. Thomas.

Melinis minutiflora Beauv., MOLASSES GRASS, South America, grown as a forage grass in Porto Rico, is a perennial, odorous, velvety, slender species up to almost a meter in height, with a terminal panicle of numerous awned spikelets.

Polytrias amaura (Buese) Kuntze [*P. praemorsa* Hack.], JAVA GRASS, experimentally planted for use as a lawn-grass in Porto Rico, is a low, prostrate, densely tufted grass, with rather slender, brownish, hairy racemes 2-5 cm. long.

Tripsacum latifolium Hitch., CAYENNE GRASS, seen growing luxuriantly at the Agricultural Experiment Station, Mayaguez, in 1923, is an erect grass 2-2.5 m. high, with broad flat leaves, the spikes 3 together in clusters axillary to leafy bracts.

Tripsacum laxum Nash, GUATEMALA GRASS, also seen growing luxuriantly at the Mayaguez Station, and also at the St. Croix Station is similar to the preceding species, but with solitary spikes

Tricholaena rosea Nees, NATAL GRASS of Africa, cultivated at the Insular Experiment Station, Rio Piedras and tending there in 1922 to spread beyond cultivation, is a slender perennial species 6-10 dm. high with panicked, silky red-purple spikelets, now naturalized in northern Cuba and in Florida.

Hyparrhenia rufa (Nees) Stapf, African, grown at the Mayaguez Agricultural Experiment Station, is a tufted perennial tall grass, with long narrow leaves, the reddish-pubescent awned spikelets in panicles. [*Trachypogon rufus* Nees; *Cymbopogon rufum* Rendle.]

Stipa tortilis Desf., of southern Europe was recorded by Krebs from St Thomas, probably in error.

Family 2. **CYPERACEAE** J. St. Hilaire

SEDGE FAMILY

Grass-like or rush-like herbs. Stems (culms) slender, solid (rarely hollow), triangular, quadrangular, terete or flattened. Roots fibrous (many species perennial by long rootstocks). Leaves narrow, with closed sheaths. Flowers perfect or imperfect, arranged in spikelets, one (rarely 2) in the axil of each scale (glume, bract), the spikelets solitary or clustered, 1-many-flowered. Scales 2-ranked or spirally imbricated, persistent or deciduous. Perianth hypogynous, composed of bristles, or interior scales, rarely calyx-like, or sometimes wanting. Stamens 1-3, rarely more. Filaments slender or filiform. Anthers 2-celled. Ovary 1-celled. Ovule 1, anatropous, erect. Style 2-3-cleft or rarely simple or minutely 2-toothed. Fruit a lenticular, plano-convex, or trigonous achene. Endosperm mealy. Embryo minute.

About 65 genera and 3000 species, of very wide geographic distribution.

A. Flowers, at least the pistillate ones, perfect.

a. All the spikelet-scales subtending flowers or only 1 or 2 empty.

Scales of the spikelets distichous (See *Abildgaardia*).

Spikelets with only 1 perfect flower.

Spikelets with 2 to many perfect flowers.

Scales of the spikelets spirally imbricated.

Base of the style persistent as a tubercle on the achene.

Spikelet 1, culm leafless; bristles usually present.

Spikelets several or many; leaves present; bristles none.

Base of the style not persistent as a tubercle.

Flowers without any inner scales (petals).

Base of the style swollen; bristles none.

Spikelets terete.

Spikelets compressed, their scales pseudodistichous.

Base of the style not swollen; bristles usually present.

Flowers with 3 expanded inner scales (sepals) alternating with 3 bristles in our species.

b. Three or more of the lower scales usually empty.

Style 2-cleft.

Bristles none; spikelets several-flowered.

Spikelets in a terminal involucre cluster.

Spikelets in umbels or panicles.

Bristles present, except in a few species; spikelets variously clustered, the clusters not involucre.

Style 3-cleft.

Pistillate flower axillary; plants tall.

Bristles none.

Bristles present.

Pistillate flower subterminal; plants low, leafy.

B. Flowers all imperfect.

Pistillate flower subtended by scales.

Lower spikelets of the panicles staminate, the upper pistillate.

Staminate and pistillate spikelets variously intermixed in the panicles.

Pistillate flower enclosed in a perigynium.

1. *Kyllinga*.
2. *Cyperus*.
3. *Eleocharis*.
4. *Stenophyllus*.
5. *Fimbristylis*.
6. *Abildgaardia*.
7. *Scirpus*.
8. *Fuirena*.
9. *Dichromena*.
10. *Ptilocarya*.
11. *Rynchospora*.
12. *Mariscus*.
13. *Machaerina*.
14. *Remirea*.
15. *Lagenocarpus*.
16. *Scleria*.
17. *Carex*.

1. **KYLLINGA** Rottb. Descr. & Ic. 12. 1773.

Annual or perennial sedges, with slender triangular culms, leafy below, and with 2 or more leaves at the summit forming an involucre to the strictly sessile, simple or compound dense head of spikelets. Spikelets numerous, compressed,

falling away from the axis of the head at maturity, consisting of only 3 or 4 scales, the 1 or 2 lower ones small and empty, the middle one fertile, the upper empty or staminate. Joints of the rachis wingless or narrowly winged. Scales 2-ranked, keeled. Perianth none. Stamens 1-3. Style 2-cleft, deciduous from the summit of the achene. Achene lenticular. [In honor of Peter Kylling, a Danish botanist of the seventeenth century.] About 15 species, natives of tropical and temperate regions.

Perennials, with rootstocks.

Basal leaves with blades.

Leaves long, the apex gradually acuminate.

Leaves short, the apex acute.

Basal leaves reduced to sheaths.

Annual or biennial; roots fibrous.

Fertile scale setulose on the keel, eglandular.

Fertile scale smooth on the keel, glandular.

1. *K. brevifolia*.

2. *K. pungens*.

3. *K. peruviana*.

4. *K. pumila*.

5. *K. odorata*.

1. *Kyllinga brevifolia* Rottb. Deser. & Icon. 13. 1773.

Perennial by slender rootstocks; culms 6 dm. high or less, slender. Leaves 2-4 cm. wide, attenuate at the apex, the basal ones as long as the culm or much shorter, those of the involucre 3 or 4, the longer sometimes 12 cm. long; heads 1-3, usually only 1, ovoid to short cylindrical, 5-12 mm. long; fertile scale ovate-lanceolate, boat-shaped, submucronate, the keel rough-setulose, or wholly smooth.

Wet or moist grounds, at lower and middle elevations, Porto Rico: St. Thomas; St. Croix; St. Jan; Tortola:—southern United States; West Indies; tropical continental America and Old World tropics.

2. *Kyllinga pungens* Link, Hort. Berol. 1: 326. 1827.

Perennial by short scaly rootstocks; culms erect or reclining, 3-8 dm. long. Basal leaves much shorter than the culm, 3-4 mm. wide, acute, those of the involucre 2-4, 6 cm. long or less; head solitary, subglobose to short-cylindrical, about 1 cm. thick; spikelets lanceolate; fertile scale acute or mucronate, boat-shaped, keeled, 3-nerved on each side. [*Scirpus mutatus* Bello, not L.]

Moist grassy places near Mayaguez, Porto Rico; St. Croix:—Hispaniola; Jamaica; continental tropical America and Old World tropics.

3. *Kyllinga peruviana* Lam. Encycl. 3: 366. 1789.

Kyllinga aphylla Kunth, Enum. 2: 127. 1837.

Perennial by short stout rootstocks covered by ovate scales; culms rather stout, erect, 7 dm. high or less. Basal leaves reduced to tubular sheaths 1-5 cm. long; involucre leaves reduced to triangular acute bracts mostly shorter than the solitary head of spikelets; head about 1 cm. in diameter; spikelets many, brownish, about 4 mm. long, ovate-lanceolate; fertile scale mucronulate, boat-shaped, striate. [*Scirpus nodulosus* Bello, not Roth.]

In swamps and marshes, rarely on sand dunes, at lower elevations, Porto Rico:—Jamaica; Hispaniola; Antigua; Trinidad; continental tropical America; tropical Africa.

4. *Kyllinga pumila* Michx. Fl. Bor. Am. 1: 28. 1803.

Annual, fibrous-rooted; culms tufted, slender to filiform, 4 dm. long or less. Leaves 0.7-5 mm. wide, the basal ones mostly shorter than the culm, those of the involucre 3-5, elongated, spreading; heads 1-3, ovoid to ovoid-oblong, 5-9 mm. long, or the lateral ones smaller; spikelets brownish; fertile scale ovate-lanceolate, acute, not glandular, its keel setose.

Moist grassy places, Porto Rico; St. Thomas (according to Clarke); Tortola:—southeastern United States; Mexico to Brazil; Jamaica; Cuba to Trinidad; Africa.

5. *Kyllinga odorata* Vahl, Enum. 2: 382. 1805.

Annual or biennial, fibrous rooted; culms rather slender, tufted, 4 dm. long or less. Leaves grass-like, 2-4 mm. wide, the basal ones shorter than the culm, those of the involucre 3 or 4, the longer 8-12 cm. long; heads 1-4, cylindrical to ovoid-cylindrical, 7-15 mm. long, or the lateral ones much smaller; spikelets yellowish-brown; fertile scale ovate-oblong, depressed-glandular, its keel smooth.

Roadsides and sandy places at lower and middle elevations, Porto Rico; St. Thomas; St. Jan.—southern United States; Mexico to Uruguay; Jamaica; Cuba; Trinidad.

2. **CYPERUS** [Tourn.] L. Sp. Pl. 44. 1753.

Annual or perennial sedges. Culms in our species simple, mostly triangular, mostly leafy near the base, and with 1 or more leaves at the summit forming an involucre to the simple or compound, umbellate or capitate inflorescence. Rays of the umbel sheathed at the base, usually very unequal, one or more of the heads or spikes commonly sessile. Spikelets flat or subterete, the scales falling away from the rachis as they mature (nos. 1-19), or persistent and the spikelets falling away from the axis of the head or spike with the scales attached (nos. 20-34). Scales concave, conduplicate or keeled, 2-ranked, all flower-bearing or the lower ones empty. Flowers perfect. Perianth none. Stamens 1-3. Style 2-3-cleft, deciduous from the summit of the achene. [Ancient Greek name for these sedges.] About 600 species, of wide distribution in tropical and temperate regions, called GALINGALE. Type species: *Cyperus esculentus* L.

- A. Style-branches 2; achene lenticular or plano-convex.
 Achene laterally compressed [Genus *TYCRAEUS* Beauv.]
 Superficial cells of achene oblong. 1. *C. flarescens*.
 Superficial cells of achene quadrate. 2. *C. odoratus*.
 Achene dorsally compressed [Genus *JUNCCELLUS* Clarke]. 3. *C. laevigatus*.
- B. Style-branches 3; achene trigonous.
 a. Rachis of the spikelet persistent [*EUCYPERUS*].
 *Rachis wingless, or very narrowly winged.
 Annuals.
 Scales sharply acuminate or awned.
 Scales sharply acuminate. 4. *C. compressus*.
 Scales with recurved awns. 5. *C. cuspidatus*.
 Scales obtusish. 6. *C. sphacllatus*.
 Perennials.
 Spikelets spicate. 7. *C. distans*.
 Spikelets digitate.
 Stamens 3 or 2.
 Scales acute; basal leaves reduced to sheaths;
 culms smooth.
 Involucral leaves 8-20. 8. *C. alternifolius*.
 Involucral leaves 1-3. 9. *C. Haspan*.
 Scales mucronate or short-awned; basal
 leaves normal; culms viscid-pubescent. 10. *C. elegans*.
 Stamen only 1.
 Spikelets linear-oblong to oblong-lanceolate,
 yellow. 11. *C. ochraceus*.
 Spikelets ovate; leaves not transversely
 nerved.
 Spikelets capitate, yellow to yellow-brown. 12. *C. surinamensis*.
 Spikelets densely glomerate, red to red-
 dish-brown. 13. *C. Luzulac*.
 Spikelets ovate, green-brown; leaves strongly
 transversely nerved. 14. *C. virens*.
- **Rachis broadly winged.
 Perennials.
 Culms leafy below, not pseudoseptate; plants tuberif-
 erous.
 Spikelets purple-brown. 15. *C. rotundus*.
 Spikelets yellow-brown. 16. *C. esculentus*.
 Culms leafless, pseudoseptate. 17. *C. articulatus*.
 Annuals, flowering the first season.
 Wings of the rachis at length separating from it;
 no basal leaves. 18. *C. giganteus*.
 Wings of the rachis persistent; basal leaves
 present. 19. *C. radiatus*.

- b. Rachis of the spikelets deciduous above the 2 lower scales
[MARTIUS Clarke, not Zimm.]
*Achene more than twice as long as thick; heads globose. 20. *C. globulosus*.
**Achene not more than twice as long as thick; spikelets
mostly spicate or capitate.
Spikelets with 1-5 achenes.
Umbel simple or head only one.
Spikelets spreading.
Scales of the spikelet imbricated.
Spikelets yellow or yellowish. 21. *C. cayennensis*.
Spikelets 2-4 mm. long. 22. *C. granularis*.
Spikelets 1 mm. long; spike solitary.
Spikelets dark brown; head solitary,
globose.
Scales of the spikelet few, faintly
nerved, acute. 23. *C. calcicola*.
Scales of the spikelet numerous, strong-
ly nerved, mucronate. 24. *C. fuliginosus*.
Scales of the spikelets distant. 25. *C. Urbani*.
Spikelets in age reflexed; spike 1, short. 26. *C. tenuis*.
Umbel compound. 27. *C. ligularis*.
Spikes oblong, 8-10 mm. thick. 28. *C. incompletus*.
Spikes long-cylindric, 5-7 mm. thick.
Spikelets with 5-25 achenes. 29. *C. confertus*.
Scales awned; spikelets capitate.
Scales acute or acuminate; spikelets spicate.
Umbel capitate or with rays up to 3 cm. long;
spikelets 2-3 mm. wide. 30. *C. brunneus*.
Umbel decompound, with rays 4-6 cm. long;
spikelets 1.5 mm. wide. 31. *C. planifolius*.
- c. Rachis of the spikelets separating into 1-fruited joints [Genus
TORULINIUM Desv.]. 32. *C. fitiformis*.
Perennial; culms slender; spikes 1 or 2. 33. *C. ferax*.
Annual; culms stout; spikes numerous. 34. *C. VahlII*.
Spikelets yellow-brown, loosely spicate.
Spikelets dark brown, densely spicate.
1. **Cyperus flavescens** L. Sp. Pl. 46. 1753.
Pycracus flavescens Beauv.; Reich. Fl. Germ. Excurs. 72. 1830.
Annual; culms slender, tufted, 3 dm. tall or less. Leaves 2-3 mm. wide,
smooth, mostly shorter than the culm; heads of spikelets solitary, or in a 2-4-
rayed umbel; spikelets linear, subacute, yellow, flat, 8-18 mm. long, about 3
mm. wide, many-flowered; scales ovate, obtuse, appressed, twice as long as the
black, shining, lenticular achene; stamens 3; style branches 2; superficial cells of
the achene oblong.
Wet grounds near Bayamon and Dorado:—eastern United States; Bermuda; Cuba;
Hispaniola; Mexico; Europe and Asia.
2. **Cyperus odoratus** L. Sp. Pl. 46. 1753.
Pycracus polystachyos Beauv. Fl. Owar. 2: 48. 1807.
Cyperus polystachyos R. Br. Prodr. 214. 1810.
Pycracus odoratus Urban, Symb. Ant. 2: 164. 1900.
Annual, or perennial with a rootstock up to 5 cm. long; culms slender, tufted,
8 dm. high or less. Leaves as long as the culms or shorter, 2-5 mm. wide, those
of the involucre spreading; umbel 1-5-rayed, or sometimes capitate, the rays
5 cm. long or less; spikelets linear to linear-lanceolate, 6-20 mm. long, about 2
mm. wide, acute; scales gray-brown or yellow-brown, dull, acutish, one-half
longer than the gray, oblong dull achene; style-branches 2; superficial cells of the
achene quadrate.
Moist grassy places at lower and middle elevations, Porto Rico; St. Thomas; Tortola;
Virgin Gorda:—Cuba; Hispaniola; Antigua to Trinidad; Jamaica; continental tropical
America; southern United States; Old World tropics.
3. **Cyperus laevigatus** L. Mant. 179. 1771.
Juncellus laevigatus Clarke, in Hook. f. Fl. Brit. Ind. 6: 596. 1893.
Perennial by horizontal rootstocks; culms rather stout, erect, 1-6 dm. high,
trigonus above. Basal leaves strongly sheathing, usually much shorter than
the culm, sometimes reduced to sheaths, those of the involucre 1 or 2, when only

1 erect and much exceeding the spikelets; spikelets 1 to many, capitate, appearing lateral, 6–12 mm. long, 2–3 mm. wide, compressed, linear-oblong, many-flowered, scales ovate, obtuse, whitish to brown; style-branches 2; achene plano-convex, obovoid, brown, 1.5–2 mm. long.

Moist or wet soil, mostly in saline situations near the coasts, Porto Rico; St. Thomas; St. Croix; Virgin Gorda:—southern United States; Cuba to Antigua; Jamaica; continental tropical America and Old World species.

4. *Cyperus compressus* L. Sp. Pl. 46. 1753.

Annual, fibrous-rooted; culms tufted, spreading or erect, 1–4 dm. long, wiry. Leaves mostly shorter than the culm, 1–3 mm. wide, those of the involucre 2 or 3, the longer one surpassing the inflorescence; umbel capitate, or with 2 or 3 rays up to 1.5 cm. long; spikelets 3–10 in the clusters, lanceolate, 8–25 mm. long, 3–5 mm. wide, several many-flowered; rachis wingless; scales ovate, acuminate, firm, keeled, light green with a yellowish band on both sides; stamens 3; achene obovoid, dull, obtuse, brown to black, sharply 3-angled.

Waste and cultivated grounds at lower and middle altitudes, Porto Rico; Vieques; Culebra; St. Thomas; Virgin Gorda:—southern United States; West Indies; tropical continental America and Old World tropics.

5. *Cyperus cuspidatus* H.B.K. Nov. Gen. 1: 204. 1816.

Annual, glabrous; culms tufted, 2–14 cm. tall, as long as the leaves, or longer. Leaves 1–2 mm. wide, those of the umbel usually 3 or 4, sometimes 1 dm. long; umbel 2–5-rayed, rarely capitate; rays 0.5–5 cm. long; spikelets linear, 5–12 mm. long, about 1.5 mm. wide, digitate, many-flowered; scales chestnut-brown, nearly 2 mm. long, the recurved spreading awn-like tip nearly as long as the body, strongly 3–5-nerved, keeled; stamens 1–3; achene broadly obovoid, 0.5 mm. long, trigonous, brown, apiculate; style very short.

On the rocky limestone plain, Anegada:—southern United States; Bahamas; Cuba; Yucatan; northern South America.

6. *Cyperus sphacelatus* Rottb. Descr. & Icon. 26. 1773.

Annual, fibrous-rooted; culms tufted, somewhat thickened at the base, spreading or erect, 6 dm. long or less. Leaves 1.5–5 mm. wide, mostly shorter than the culm, those of the involucre 3–6, the longer ones mostly surpassing the inflorescence; umbel simple or compound, 1–8-rayed, the longer rays up to 15 cm. long; spikelets rather loosely short-spicate, linear, acute, flat, 1–5 cm. long, 1.5–2 mm. wide; scales ovate, obtusish, light green or with purple margins; rachis narrowly winged; stamens 3; achene narrowly ellipsoid, 3-angled.

Moist grassy situations and waste grounds at lower and middle elevations, Porto Rico; Vieques; St. Thomas; Tortola:—West Indies (except Bahamas); continental tropical America; tropical Africa.

7. *Cyperus distans* L. f. Suppl. 103. 1781.

Perennial by short rootstocks or stolons; culms stout, up to 1.5 m. tall, often overtopped by the leaves. Leaves 5–12 mm. wide, those of the involucre about 5, the longer ones surpassing the inflorescence; umbel large, usually compound, the slender rays 2 dm. long or less; leaves of the involucels mostly shorter than the raylets; spikelets rather loosely spicate, narrowly linear, 1–3 cm. long, about 1 mm. wide; scales oblong, obtuse, 2 mm. long, distant, reddish-brown; rachis very narrowly winged; stamens 3; achene oblong or narrowly oblong-obovoid, 3-angled, 1.5 mm. long, brownish-black, obtusely pointed.

Moist woodlands and along streams from lower to higher elevations, Porto Rico; St. Thomas; St. Croix:—Jamaica; Hispaniola to Trinidad; tropical continental America and Old World tropics.

8. *Cyperus alternifolius* L. Mant. 28. 1767.

Perennial by short stout rootstocks, glabrous; culms stout, tufted, 1.5 m. high or less, trigonous, smooth. Basal leaves reduced to lanceolate acuminate sheaths; leaves of the involucre 12–20, spreading, 1–2.5 dm. long, 4–10 mm. wide, flat, linear, acuminate, longer than the inflorescence; umbel decomposed, often 1.5 dm. broad; rays numerous, nearly filiform; heads very numerous, the spikelets few, digitate, linear, obtusish, many-flowered, 10 mm. long or less, 1.5–2 mm. wide; rachis narrowly membranous-winged; scales greenish yellow to brownish, lanceolate, acute, obscurely nerved, appressed; achene oblong, narrowed at each end, trigonous, a little shorter than the scale.

Naturalized in swamps and along streams:—Florida; Bermuda; Cuba; Guadeloupe; Martinique; St. Vincent. Often planted for ornament; many seedlings were seen on an old wall at Ponce. Native of Madagascar. UMBRELLA SEDGE.

9. *Cyperus Haspan* L. Sp. Pl. 45. 1753.

Perennial by short rootstocks, or sometimes annual; culms weak, tufted, 3–10 dm. long. Basal leaves reduced to membranous pointed sheaths; involucral leaves usually 2, 1–3 mm. wide, shorter than or somewhat exceeding the inflorescence; umbel compound or simple, its rays 10 cm. long or less; spikelets few in the clusters, digitate, linear, many-flowered, flat, 6–15 mm. long, 1–2 mm. wide; scales ovate to oblong-lanceolate, reddish or greenish-brown, keeled; rachis-wings narrow, membranous; stamens 2 or 3; achene obovoid, obtuse, 3-angled, nearly white, half as long as the scale.

Ditches and marshes, northern coastal plain of Porto Rico and in the eastern mountains:—southeastern United States; Cuba; Hispaniola; Jamaica; Trinidad; continental tropical America and Old World tropics.

10. *Cyperus elegans* L. Sp. Pl. 45. 1753.

Cyperus viscosus Sw. Prodr. 20. 1788.

Perennial by short rootstocks; culms viscid-pubescent, 8 dm. tall or less. Leaves convolute in drying, the basal ones about as long as the culm, those of the involucre about 3, the longer ones much surpassing the inflorescence; umbel usually compound, the rays up to 15 cm. long; spikelets 2–12 in the clusters, digitate, oblong-lanceolate, 6–15 mm. long, 3–5 mm. wide, compressed; scales green-brown, ovate, strongly mucronate, about 3 mm. long; stamens and style-branches 3; achene obovoid, 3-angled, nearly black, about half as long as the scale.

Wet saline soil, Porto Rico; Mona; St. Thomas; St. Jan; St. Croix; Aneгада:—Florida; West Indies; continental tropical America.

11. *Cyperus ochraceus* Vahl, Enum. 2: 325. 1805.

Perennial; culms rather stout, 2–7 dm. tall. Leaves 6 mm. wide or less, the basal ones mostly shorter than the culm, those of the involucre several, spreading, 2 or more of them much longer than the compound or simple umbel; umbel-rays 15 cm. long or less; spikelets numerous, capitate, flattish, blunt, many-flowered, 5–12 mm. long, about 2 mm. wide; scales yellow, ovate to ovate-lanceolate, obtusish; stamen 1; achene ovoid, 3-angled, narrowed at both ends.

In wet soil at lower elevations, Porto Rico; St. Croix:—southern United States; Bahamas; Cuba to Guadeloupe; Jamaica; continental tropical America.

12. *Cyperus surinamensis* Rottb. Descr. & Icon. 35. 1773.

Perennial by short rootstocks; culms slender to stout, longer than the leaves, 3–12 dm. tall. Leaves 1.5–4 mm. wide, those of the involucre 5–7, the longer much surpassing the compound inflorescence; umbel-rays 5–12, slender, 1–15 cm.

long; spikelets numerous, capitate, ovate to oblong, flat, 5–12 mm. long, 2–3 mm. wide, obtusish; scales ovate-lanceolate, keeled, nearly 1.5 mm. long, yellow or yellow-brown, apiculate; stamen 1; achene oblong or ellipsoid, 3-angled, narrowed at both ends, half as long as the scale. [*C. acuminatus* Bello, not Torr. & Hook.]

In wet or moist soil at lower and middle elevations, Porto Rico; Vieques; St. Thomas;—southern United States; West Indies; continental tropical America.

13. **Cyperus Luzulae** (L.) Retz. Obs. 4: 11. 1786.

Scirpus Luzulae L. Sp. Pl. ed. 2, 75. 1762.

Perennial by short rootstocks; culms stout, 1 m. high or less. Leaves 3–7 mm. wide, the basal ones often overtopping the culm, those of the involucre 5–10, much exceeding the inflorescence; umbel usually simple with short rays; spikelets densely glomerate, numerous, ovate, 3–5 mm. long, 2–3 mm. wide, flat, 6–12-flowered; scales oblong, obtusish, mostly reddish-brown; stamen 1; achene oblong to oblong-obovoid, 3-angled, half as long as the scale.

Moist grounds, collected on Porto Rico by Bertero, and near Bayamon by Brother Hiram;—Hispaniola to Trinidad; Mexico and continental tropical America.

14. **Cyperus virens** Michx. Fl. Bor. Am. 1: 28. 1803.

Perennial by short rootstocks. Culms stout, smooth, 1.5 m. tall or less; basal leaves shorter than the culm, strongly transversely lineolate between the veins, 5–12 mm. wide, those of the involucre several, similar to the basal ones, the longer much surpassing the inflorescence; umbel compound, its 3–12-rays 2 dm. long or less, sometimes quite short; spikelets in capitate clusters, ovate, flat, acutish, several-many-flowered, 6–14 mm. long, 3–4 mm. wide; scales ovate-oblong, green, keeled, obtusish, 2–2.5 mm. long; stamen only 1; achene linear, trigonous, about one-half as long as the scale.

Wet grounds near Bayamon and Pueblo Viejo;—southeastern United States; Cuba; Mexico. Recorded from Guadeloupe.

15. **Cyperus rotundus** L. Sp. Pl. 45. 1753.

Perennial by long tuber-bearing rootstocks; culms rather stout, 8 dm. high or less, thickened at the base. Leaves 3–6 mm. wide, the basal ones shorter than the culm, those of the involucre 3–5, the longer usually exceeding the 3–8-rayed, simple or compound umbel; rays slender, 3–12 cm. long; spikelets loosely spicate, linear, acute, 1–4.5 cm. long, 2–3 mm. wide; scales purple-brown or greenish-purple, ovate, acute or obtusish, scarious-margined; rachis-wings hyaline; stamens 3; achene ellipsoid, 3-angled, half as long as the scale. [*C. esculentus* of Bello, not of Linnaeus.]

Moist and cultivated grounds and waste places at lower and middle elevations, often a pernicious weed, Porto Rico; Vieques; St. Thomas; St. Jan; Tortola; Virgin Gorda; St. Croix;—southeastern United States; West Indies; continental tropical America; warm-temperate and tropical parts of the Old World. NUT-GRASS. COQUIL.

16. **Cyperus esculentus** L. Sp. Pl. 45. 1753.

Perennial by scaly horizontal tuber-bearing rootstocks; culms usually stout, 3–7 dm. tall, commonly shorter than the leaves. Leaves light green, 4–8 mm. wide, the midvein prominent; those of the involucre 3–6, the longer much exceeding the inflorescence; umbel 4–10-rayed, often compound; spikelets numerous in loose spikes, straw-colored or yellowish-brown, flat, spreading, 12–25 mm. long, 2–3 mm. wide, many-flowered; scales ovate-oblong, subacute, 3–5-nerved; rachis narrowly winged; stamens 3; style 3-cleft; achene obovoid, obtuse, 3-angled.

Waste grounds, Palo Seco, Porto Rico; St. Thomas (according to Clarke);—temperate and subtropical continental North America; Europe and Asia; Bermuda; Cuba; Hispaniola; Guadeloupe, Martinique; Bonaire.

17. *Cyperus articulatus* L. Sp. Pl. 44. 1753.

Perennial by thick scaly rootstocks; culms stout, 2 m. tall or less, terete, pseudoseptate at intervals from 8 to 20 mm. Basal leaves reduced to scarious bladeless sheaths, those of the involucre usually 3, triangular ovate to linear-lanceolate, much shorter than the inflorescence; umbel 4-10-rayed, compound; spikelets few to several in the clusters, narrowly linear, 1.5-5 cm. long, about 1.5 mm. wide; scales ovate, obtusish, about 3 mm. long, straw-color; rachis-wings oblong; stamens 3; achene oblong, 3-angled, nearly black, about $2/5$ as long as the scale.

In streams and lagoons and in mud, Porto Rico, up to 900 m. elevation; St. Thomas; St. Croix; Tortola;—southeastern United States; Cuba to St. Thomas and Trinidad; continental tropical America and Old World tropics.

18. *Cyperus giganteus* Vahl, Enum. 2: 364. 1805.

Fibrous-rooted; culms stout, 2 m. high or less. Basal leaves none; leaves of the involucre numerous, up to 8 dm. long, 1-2.5 cm. wide, those of the involucels also numerous, 2.5 dm. long or less, mostly not over 6 mm. wide, erect or ascending, much longer than the umbellets; inflorescence large, sometimes 1 m. broad; spikelets numerous, spicate, 8-12 mm. long, 1 mm. wide, compressed, several-flowered; rachis-wings lanceolate, deciduous; scales brown, ovate, obtusish; stamens 3; achene oblong-ellipsoid, 3-angled, blackish, about one-fourth as long as the scale.

Marshes and ditches at lower elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Trinidad; tropical continental America.

19. *Cyperus radiatus* Vahl, Enum. 2: 369. 1805.

Fibrous-rooted; culms slender to stout, 1 m. high or less. Leaves 4-9 mm. wide, the basal ones shorter than the culm, those of the involucre several, the longer much exceeding the compound umbel; spikelets spicate, 5-9 mm. long, about 1 mm. wide, in sessile spikes 5 cm. long or less; rachis-wings oblong, persistent; scales ovate, brown, obtuse or mucronulate; stamens 3; achene oblong, 3-angled, blackish, about half as long as the scale.

River-banks and wet soil at low elevations, Porto Rico:—Jamaica; Hispaniola; Trinidad; tropical continental America and Old World tropics.

20. *Cyperus globulosus* Aubl. Pl. Gulan. 1: 47. 1775.

Cyperus croceus Vahl, Enum. 2: 357. 1806.

Mariscus globulosus Urban, Symb. Ant. 2: 165. 1900.

Perennial by tuber-like corms; culms slender, smooth, erect, mostly longer than the leaves. Leaves pale green, 3-4 mm. wide, those of the involucre 5-10, the longer usually much exceeding the umbel; umbel 6-13-rayed; the rays filiform, their sheaths short, mucronate; spikelets 4-6 mm. long, linear, flat, capitate in globose heads; scales thin, pale green, appressed, ovate-lanceolate, acute, 9-13-nerved, with narrow scarious margins; joints of the rachis broadly winged; stamens 3; style 3-cleft; achene oblong-obovoid, obtuse, one-half as long as the scale, about twice as long as thick.

Sandy soil, northern coastal plain of Porto Rico and on the Playa de Humacao; southeastern United States; Bermuda; Jamaica; continental tropical America.

21. *Cyperus cayennensis* (Lam.) Britton, Bull. Dept. Agric. Jamaica 5: Suppl. 1, 8. 1907.

Kyllinga cayennensis Lam. Tabl. Encycl. 1: 149. 1791.

Mariscus flavus Vahl, Enum. 2: 374. 1805.

Cyperus flavus Nees, Linnaea 19: 698. 1847.

Mariscus cayennensis Urban, Symb. Ant. 2: 165. 1900.

Perennial by short rootstocks; culms slender to stout, sometimes 8 dm. high, their bases thickened. Leaves 2-8 mm. wide, the basal ones as long as the culm

or shorter, those of the involucre much exceeding the inflorescence; spikes cylindrical, dense, 8–25 mm. long, 5–8 mm. thick, sessile and capitate, or some of them peduncled; spikelets numerous, oblong, 2–4 mm. long, yellowish, bearing 1 or 2 achenes; fertile scales ovate, striate, nearly twice as long as the achene; stamens 3; achene oblong to oblong-obovoid, 1.5–2 mm. long, 3-angled.

Grassy places and waste grounds at lower and middle elevations, Porto Rico; St. Thomas; St. Croix:—Louisiana; West Indies (except Bahamas); Mexico to Paraguay.

22. **Cyperus granularis** (Desf.) Britton, Bull. Dept. Agric. Jamaica 5: Suppl. 1. 9. 1907.

Kyllinga granularis Desf.; Boeckl. Linnaea 35: 432. 1868.

Mariscus gracilis Vahl, Enum. 2: 373. 1805. Not *Cyperus gracilis* R. Br. 1810.

Cyperus nanus Boeckl. Bot. Jahrb. 1: 363. 1881. Not Willd. 1798.

Roots fibrous; rootstocks very short or wanting; culms tufted, weak, filiform, smooth, 3–25 cm. long. Basal leaves linear-filiform, shorter than the culm or as long, those of the involucre 1–3, similar, 6 cm. long or less; spikes solitary (rarely 2), globose or globose-oblong, 4–7 mm. long; spikelets about 1.5 mm. long, bearing 1 or 2 achenes, spreading or reflexed; flowering scales ovate, obtuse, striate, light brown; achene trigonous, obovoid-oblong, brown, a little shorter than the scale.

Grassy places in dry districts at lower elevations, Porto Rico; Icaos; Virgin Gorda; St. Croix:—Jamaica; Cuba; Hispaniola.

23. **Cyperus calcicola** Britton, Bull. Torr. Club 42: 387. 1915.

Perennial by short rootstocks; culms slender, tufted, smooth, 1–2.5 dm. high. Leaves shorter than the culm, 0.5–1 mm. wide; bracts of the involucre 2 or 3, the longer sometimes 4 cm. long, similar to the leaves; head globose, solitary, 5–7 mm. in diameter; spikelets about 3-flowered, 3.5–4.5 mm. long; scales dark brown, the lowest empty ones persistent on the axis after the fall of the rest of the spikelet, lanceolate, the others ovate to ovate-lanceolate, acute, faintly striate-nerved.

Limestone rocks, Cayo Muertos. Endemic.

24. **Cyperus fuliginosus** Chapm. Fl. 8. States 511. 1860.

Mariscus fuliginosus Clarke, Kew Bull. Add. Ser. 8: 16. 1908.

Perennial; culms very slender, smooth, tufted, 1–4 dm. high, rather rigid. Leaves revolute-margined, shorter than the culm, those of the involucre usually 2, unequal; spikelets linear, 6–10 mm. long, 1–1.5 mm. wide, densely crowded in a single terminal head; scales ovate to oval, about 2 mm. long, dark brown, striate, mucronulate; style 3-cleft; achenes oblong-obovoid, trigonous, about 1.5 mm. long, dull brown.

On the rocky limestone plain of Aneгада:—Florida; Bahamas; Cuban Cays; Bonaire; Curaçao.

25. **Cyperus Urbani** Boeckl. Cyp. Nov. 1: 10. 1888.

Mariscus Urbani Clarke in Urban, Symb. Ant. 2: 47. 1900.

Roots fibrous; culms very slender, tufted, 2–5 dm. long. Leaves 2–4 mm. wide, the basal ones about as long as the culm, those of the involucre about 3, up to 6 cm. long; head mostly solitary, subglobose to oblong, 5 mm. thick; spikelets about 2 mm. long, 1 mm. thick, densely capitate, bearing 2 or 3 achenes; scales pale, greenish-brown, ovate, mucronate, little imbricated, faintly striate-nerved; achene ellipsoid-obovoid, 3-angled, brown, about $\frac{3}{4}$ as long as the scale.

Grassy banks and woodlands, Porto Rico, at higher elevations; in woods on Vieques at 150 m. altitude. Endemic.

26. *Cyperus tenuis* Sw. Prodr. 20. 1788.

Mariscus tenuis Clarke in Urban, Symb. Ant. 2: 48. 1900.

Roots fibrous; rootstock very short or none; culms tufted, filiform, 1–3 dm. long. Leaves mostly shorter than the culm, smooth, 1–1.5 mm. wide, those of the involucre similar to the basal ones; spikes short, usually solitary, 6–10 mm. long; spikelets linear, 3–5 mm. long, bearing 2 or 3 achenes, at length deflexed; scales ovate, obtuse, mucronulate, striate, brown; achene ellipsoid, trigonous, a little longer than the scale.

Rocky or sandy soil at low elevations in the southwestern districts, Porto Rico; Mona; St. Croix (according to Clarke);—Jamaica; Cuba; Hispaniola.

27. *Cyperus ligularis* L. Am. Acad. 5: 391. 1759.

Mariscus rufus H.B.K. Nov. Gen. 1: 216. 1816.

Cyperus Sintenisii Boeckl. Cyp. Nov. 1: 12. 1888.

Cyperus trigonus Boeckl. Cyp. Nov. 1: 11. 1888.

Mariscus ligularis Urban, Symb. Ant. 2: 165. 1900.

Perennial; roots fibrous, thick; rootstock short or none; culms stout, 1.2 m. high or less. Leaves 8–20 mm. wide, pale green, rough-margined, the basal ones often overtopping the culm, those of the involucre sometimes 7 dm. long; umbel 4–12-rayed, large, compound; spikes oblong or subglobose, 8–10 mm. thick, very dense; spikelets gray to brown, 4–6 mm. long, about 1.5 mm. wide, bearing 2–4 achenes; fruiting scales oval or ovate, striate, blunt, 2.5–3 mm. long; achene narrowly obovoid to ellipsoid, dark brown, dull, 3-angled, about 1.5 mm. long, half as long as the scale. [*Scirpus ferrugineus* Bello, not L.]

Marshes and ditches at low elevations, Porto Rico, near the coast: Icacos; Culebra; Vieques; Mona; St. Thomas; St. Jan; St. Croix; Tortola.—Florida; West Indies; continental tropical America; tropical Africa.

28. *Cyperus incompletus* (Jacq.) Link, Hort. Berol. 1: 319. 1827.

Kyllinga incompleta Jacq. Coll. 4: 101. 1790.

Mariscus elatus Vahl, Enum. 2: 377. 1805.

Mariscus Mutisii H.B.K. Nov. Gen. 1: 216. 1816.

Cyperus Mutisii Griseb. Fl. Br. W. 1. 567. 1864.

Cyperus compresso-triqueter Boeckl. Cyp. Nov. 1: 10. 1888.

Mariscus incompletus Urban, Symb. Ant. 2: 165. 1900.

Perennial by rootstocks; culms stout, 3–9 dm. high. Leaves 6–14 mm. wide, the basal ones about as long as the culm, those of the involucre 4–7, the longer much exceeding the inflorescence; umbel compound, its rays 2 dm. long or less; spikes narrowly cylindrical, rather dense, 2–4 cm. long, 7–11 mm. thick, digitate; spikelets oblong, 3–6 mm. long, bearing 1–3 achenes; scales yellow-brown, ovate, obtuse; achene oblong to ellipsoid, 3-angled, about $\frac{3}{4}$ as long as the scale.

Banks and hillsides at lower and middle elevations, Porto Rico;—Jamaica; Hispaniola; Martinique; continental tropical America.

29. *Cyperus confertus* Sw. Prodr. 20. 1788.

Mariscus confertus Clarke in Urban, Symb. Ant. 2: 50. 1900.

Perennial by short rootstocks; culms rather slender, 1–4 dm. high, clustered. Leaves 3–5 mm. wide, the basal ones as long as the culm or shorter, those of the involucre 2 dm. long or less, the longer much surpassing the inflorescence; umbel simple, 1–7-rayed; heads subglobose, about 1 cm. thick; spikelets greenish-yellow, 5–7 mm. long, about 2 mm. wide, flat, bearing 5–9 achenes; fertile scales ovate, keeled, strongly striate, tipped with short, somewhat curved awns; stamens 3 or sometimes 2; achene oblong-obovoid, 3-angled, 1–1.5 mm. long, about half as long as the scale.

Sandy or gravelly soil at lower elevations, Porto Rico; St. Thomas; St. Croix; Virgin Gorda;—Jamaica; Hispaniola; St. Kitts to Martinique; northern South America; Galapagos.

30. **Cyperus brunneus** Sw. Fl. Ind. Occ. 1: 116. 1797.*Cyperus Krugii* Boeckl. Cyp. Nov. 1: 8. 1888.*Mariscus brunneus* Clarke in Urban, Symb. Ant. 2: 51. 1900.*Cyperus discolor* Boeckl. Cyp. Nov. 1: 7. 1888.

Perennial by stout rootstocks; culms stout, 7 dm. high or less. Leaves 4–10 mm. wide, pale green, the basal often overtopping the culm, those of the involucre 3–5, the longer much surpassing the inflorescence; umbel few-rayed, or glomerate, simple or little compound, the rays up to 3 cm. long; spikelets short-spicate, 1–2 cm. long, about 3 mm. wide, with 5–10 achenes; scales brown, ovate, apiculate, strongly striate-nerved; achene obovoid, 3-angled, about half as long as the scale.

Coastal sands, Porto Rico; Mona; Icaos; Vieques; St. Thomas; St. Croix; St. Jan; Anegada;—Florida; West Indies south to St. Vincent; Central America; Fernando Noronha. The species consists of several slightly differing races.

31. **Cyperus planifolius** L. C. Richard, Act. Soc. Hist. Nat. Paris 1: 106. 1792*Cyperus purpurascens* Vahl, Enum. 2: 359. 1805.*Mariscus purpurascens* Clarke in Urban, Symb. Ant. 2: 51. 1900.*Mariscus planifolius* Urban, Symb. Ant. 2: 165. 1900.

Perennial by short rootstocks; culms stout, 8 dm. high or less. Leaves 5–12 mm. wide, pale green, the basal ones often overtopping the culm, the longer ones of the involucre up to 6 dm. long, much surpassing the compound or decomposed inflorescence; umbel-rays slender, 5–12 cm. long; spikelets loosely spicate, about 1 cm. long, 1.5 mm. wide, bearing 8–12 achenes; scales red-brown, ovate, obtuse, twice as long as the obovoid 3-angled achene.

Punta de la Tuna near Maunabo; slopes of Mt. Yunque; border of mangrove swamp, Culebra; Vieques; St. Thomas; St. Croix; Tortola; Virgin Gorda;—St. Kitts to Trinidad and the Dutch Islands.

32. **Cyperus filiformis** Sw. Prodr. 20. 1788.*Cyperus unifolius* Boeckl. Linnaea 36: 374. 1869.*Torulium filiforme* Clarke in Urban, Symb. Ant. 2: 57. 1900.

Perennial by slender or short rootstocks; culms slender, wiry, spreading or erect, 1–7 dm. long. Leaves about 2 mm. wide, the basal ones usually much shorter than the culm, sometimes as long, those of the involucre 1 or 2, 1–15 cm. long; spikes usually solitary, rarely 2, of 2–10, nearly digitate, terete spikelets 0.5–2.5 cm. long, about 1 mm. thick; scales yellowish with a green keel, shining, acutish, inrolled; ovate in outline, the successive ones on each side of the spikelet not overlapping; achene ellipsoid, pointed at both ends, 3-angled, shorter than the scale.

Moist sandy and rocky places at lower and middle elevations, Porto Rico; St. Thomas; St. Croix;—Bahamas; Cuba; Hispaniola.

33. **Cyperus ferax** L. C. Richard, Act. Soc. Hist. Nat. Paris 1: 106. 1792.*Torulium confertum* Hamilt. Prodr. 15. 1825.*Cyperus fastuosus* Hamilt. Prodr. 12. 1825.*Cyperus poeoides* Hamilt. Prodr. 12. 1825.*Cyperus Ehrenbergii* Kunth, Enum. 2: 89. 1837.*Torulium ferax* Urban, Symb. Ant. 2: 165. 1900.

Annual, fibrous-rooted; culms stout, solitary, erect, 12 dm. tall or less. Leaves 5–15 mm. wide, soft, the basal ones mostly shorter than the culm, those of the involucre 4–7, the longer much surpassing the inflorescence; umbel compound, its rays sometimes 2 dm. long, sometimes quite short; spikelets linear, subterete, 1–2 cm. long, 1–1.5 mm. thick, loosely or rather densely spicate;

yellowish or brownish; scales elliptic, convex, 2-3 mm. long, the successive ones on each side the spikelet somewhat overlapping; achene oblong to oblong-obovoid, 3-angled, nearly black.

Wet soil at lower and middle elevations, Porto Rico; Vieques; St. Thomas; St. Croix;—southeastern and southern United States; West Indies; tropical continental America.

In his original description of *Cyperus Eggersii* Boeckeler (Cyp. Nov. 1: 53) includes a specimen collected in Porto Rico by Sintenis (No. 4477); this species is otherwise unknown from Porto Rico or the Virgin Islands. Mr. C. B. Clarke subsequently (in Urban, Symb. Ant. 2: 55) refers this number of Sintenis to *Cyperus ferax* L. C. Richard (*Torulinium confertum* Hamilt.).

34. **Cyperus VahlII** (Nees) Steud. Syn. Pl. Cyp. 48. 1855.

Dididium VahlII Nees in Mart. Fl. Bras. 2: 53. 1842.

Torulinium VahlII Clarke in Urban, Symb. Ant. 2: 56. 1900.

Annual with fibrous roots; culms rather stout, smooth, trigonous, 2-8 dm. high. Leaves smooth, 5-12 mm. wide, the basal ones as long as the culm or shorter, those of the involucre similar but shorter; umbel compound or simple, its rays 2-10 cm. long; spikes short, dense; spikelets linear, red-brown, 8-16 mm. long, bearing few or several achenes, at length breaking up into 1-fruited joints; scales ovate-oblong, obtuse, few-nerved, achene oblong, trigonous.

Moist or wet grounds, St. Thomas; St. Jan.:—Cuba; Hispaniola; Antigua; Guadeloupe; Martinique; South America; recorded from Mexico.

Cyperus ferrugineus Poir., recorded from St. Thomas by Clarke, from a specimen in the herbarium of the British Museum, is probably an error in locality, as the plant is otherwise unknown in the West Indies.

Cyperus strigosus L., recorded by Schlechtendal as found in a garden on St. Thomas, is probably an error in determination. The species is confined to temperate North America.

3. **ELEOCHARIS** R. Br. Prodr. 1: 224. 1810.

Annual or perennial sedges. Culms simple, triangular, quadrangular, terete, flattened or grooved, the leaves reduced to sheaths or the lowest very rarely blade-bearing. Spikelets solitary, terminal, erect, several-many-flowered, not subtended by an involucre. Scales concave, spirally imbricated all around. Perianth of 1-12 bristles, usually retrorsely barbed, or wanting in some species. Stamens 2-3. Style 2-cleft and achene lenticular or biconvex, or 3-cleft and achene 3-angled, but sometimes with very obtuse angles and appearing turgid. Base of the style persistent on the summit of the achene, forming a terminal tubercle. [Greek, referring to the growth of most of the species in marshy ground.] About 140 species, widely distributed, known as SPIKE-RUSH. Type species: *Scirpus palustris* L.

- A. Spikelet mostly not thicker than the tall stout culm; scales rigid, not keeled.
Culm terete.
Culm nodose-septate.
Culm continuous.
Culm 3-4-angled, continuous.
- B. Spikelet mostly thicker than the usually slender culm; scales membranous, keeled.
- a. Style-branches usually 2; achene lenticular or biconvex.
Upper sheath hyaline and scarious at the summit; perennials.

1. *E. interstincta*.
2. *E. cellulosa*.
3. *E. mutata*.

- Bristles about as long as the achene or longer.
 Bristles shorter than the achene.
 Upper sheath truncate, oblique, or 1-toothed, not scarious.
 Annuals with fibrous roots; achenes black.
 Bristles pale or white; achene 0.5 mm. long.
 Bristles brown; achene 1 mm. long.
 Perennials with rootstocks.
 Culms stout, nodose-septate.
 Culms filiform, continuous.
- b. Style-branches 3; achene trigonous.
 Spikelet oblong, linear or ovoid.
 Culms filiform or capillary, continuous.
 Achene cancellate.
 Achene smooth.
 Culms stout, pseudoseptate.
 Spikelet obovoid.
4. *E. flaccida*.
 5. *E. flavescens*.
 6. *E. atropurpurea*.
 7. *E. caribaea*.
 8. *E. nodulosa*.
 9. *E. yunquensis*.
 10. *E. retroflexa*.
 11. *E. microcarpa*.
 12. *E. geniculata*.
 13. *E. pachystyla*.

1. ***Eleocharis interstincta*** (Vahl) R. & S. Syst. 2: 149. 1817.

Scirpus interstinctus Vahl, Enum. 2: 251. 1805.

Perennial by stout rootstocks; culms stout, terete, 4–10 dm. high, hollow, nodose-septate. Basal sheaths membranous, oblique; spikelet terete, cylindrical, 4 cm. long or less, not thicker than the culm, many-flowered; scales ovate to obovate, faintly nerved, narrowly scarious-margined, rigid, not keeled; bristles rigid, retrorsely barbed, as long as the achene, or shorter; style 3-cleft, or rarely 2-cleft; achene obovoid, brown, shining, many-striate and with many transverse ridges, about half as long as the scale; tubercle conic, acute.

In water and wet soil at low altitudes, Porto Rico; St. Thomas; St. Croix:—eastern and southern United States; West Indies; tropical continental America.

2. ***Eleocharis cellulosa*** Torr. Ann. Lyc. N. Y. 3: 298. 1836.

Perennial by long rootstocks; culms obscurely 3-angled below, terete above, 7 dm. tall or less, not nodose. Sheaths membranous, oblique; spikelet 1.5–3 cm. long, 2.5–4 mm. thick, cylindrical, somewhat thicker than the culm; scales coriaceous, obtuse, membranous-margined, many-striate; bristles 6 or 7, nearly or quite smooth, about as long as the achene; style 3-cleft; achene broadly obovoid, trigonous, striate, copiously pitted; tubercle deltoid, about one-half as wide as the achene.

Wet grounds, San Juan and Condado, Porto Rico; Tortola:—southern United States; Bahamas; Cuba; Hispaniola; Jamaica; Yucatan.

3. ***Eleocharis mutata*** (L.) R. & S. Syst. 2: 155. 1817.

Scirpus mutatus L. Pl. Jam. Pug. 6. 1759.

Perennial by stout rootstocks; culms rather stout, 1.3 m. high or less, sharply 3–4-angled, continuous. Basal sheaths membranous, oblique; spikelet cylindrical, terete, 2–5 cm. long, many-flowered, about as thick as the culm; scales firm in texture, obovate or broadly ovate, scarious-margined, faintly many-nerved, not keeled; bristles rigid, retrorsely barbed, about as long as the achene; achene obovoid, brownish, minutely cancellate, about twice as long as the conic tubercle.

In swamps and pools at lower elevations, Porto Rico; Culebra; Vieques; St. Croix; St. Jan (according to Eggers); Tortola:—eastern United States; Jamaica; Cuba to Trinidad; continental tropical America.

4. ***Eleocharis flaccida*** (Rehb.) Urban, Symb. Ant. 2: 165. 1900.

Scirpus flaccidus Rehb.; Spreng. Tent. Suppl. 3. 1828.

Eleocharis ochreatea Steud. Syn. Pl. Cyp. 79. 1855.

Eleocharis ochreatea flaccida Boeckl.; Clarke in Urban, Symb. Ant. 2: 63. 1900.

Perennial by very slender rootstocks; culms very slender, or filiform, somewhat 3-angled, 0.5–3 dm. long. Upper sheath with a hyaline membranous limb;

spikelet oblong or ovoid, 6 mm. long or less, 2-3-times as thick as the culm; scales elliptic to oblong-lanceolate, thin, pale green, with a faint midvein; style 2-cleft, achene plano-convex, obovate, smooth, dark brown, about 0.5 mm. long, 2-4 times as long as the conic acute tubercle; bristles about as long as the achene or longer, retrorsely barbed, sometimes wanting.

Wet grounds at lower and middle elevations, Porto Rico, ascending into the Luquillo Mountains; St. Thomas;—southeastern United States; Bahamas; Jamaica; Cuba to Trinidad; continental tropical America; Philippine Islands.

5. **Eleocharis flavescens** (Poir.) Urban, Symb. Ant. 4: 116. 1903.

Scirpus flavescens Poir. in Lam. Encycl. 6: 756. 1804.

Perennial by very slender rootstocks; culms very slender, 2-12 cm. long, striate. Upper sheath with a white membranous limb; spikelet ovoid to ovoid-cylindric, 2-4 mm. long; scales ovate, 1 mm. long, pale green or with a brownish band on each side of the midvein, somewhat spreading when mature; achene obovate, a little more than 0.5 mm. long, dull, greenish-brown, the conic-mitra-form tubercle about one-sixth as long; bristles white, shorter than the achene or as long.

Wet mud near Santurce and Dorado (Porto Rico is the type locality);—Cuba; San Luis Potosi to Guatemala; Australasia.

6. **Eleocharis atropurpurea** (Retz.) Kunth. Enum. 2: 151. 1837.

Scirpus atropurpureus Retz. Obs. 5: 14. 1789.

Heleocharis Sintenisii Boeckl. Cyp. Nov. 1: 16. 1888.

Heleocharis bahamensis Boeckl. Cyp. Nov. 2: 11. 1890.

Annual; roots fibrous; culms tufted, very slender, 2-9 cm. high. Upper sheath 1-toothed; spikelets ovoid, many-flowered, subacute, 3-4 mm. long, 2 mm. in diameter or less; scales minute, ovate-oblong, persistent, green or purple-brown with green midvein and very narrow scarious margins; stamens 2 or 3; style 2-3-cleft; bristles 2-4, fragile, white, minutely downwardly hispid, about as long as the achene; achene jet black, shining, 0.5 mm. long, smooth, lenticular; tubercle conic, minute, depressed but rather acute, constricted at the base.

Wet grounds, Porto Rico;—United States; Bahamas; Cuba; Europe.

7. **Eleocharis caribaea** (Rottb.) Blake, Rhodora 20: 24. 1918.

Scirpus caribaeus Rottb. Descr. 24. 1772.

Annual with fibrous roots; culms slender, tufted, striate, 0.5-3 dm. long, the upper sheath 1-toothed. Spikelet ovoid to ellipsoid, 3-6 mm. long, much thicker than the culm; scales ovate to elliptic, obtuse, yellowish-brown or whitish; bristles retrorsely barbed, about as long as the achene; style 2-cleft; achene obovate, plano-convex, black, shining, 1 mm. long; tubercle depressed-conic, much shorter than the achene.

Wet grounds at lower and middle elevations, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola;—southeastern United States; West Indies; California to Paraguay; Old World tropics and subtropics.

The name *capitata* has long been erroneously applied to this species.

8. **Eleocharis nodulosa** (Roth) Schultes, Mant. 2: 87. 1824.

Scirpus nodulosus Roth, Nov. Pl. Sp. 29. 1821.

Perennial by stout rootstocks; culms rather stout, 6 dm. high or less, terete or nearly so, pseudoseptate, upper sheath truncate or 1-toothed; spikelet 1-2.5 cm. long, 5 mm. thick or less, ovoid-cylindric, acute, densely many-flowered;

scales ovate-oblong, obtuse, brown or purple-brown, scarious margined; bristles brown, about as long as the achene; style 2 cleft; achene ovate, plano convex, 1 mm. long, brown, much longer than the black, acute tubercle.

Lake Guanica (*Sintenis 3833*, ex Clarke); St. Croix (ex Eggers):—southern United States; Cuba; Hispaniola; Antigua; Mexico and continental tropical America. Mr. N. E. Brown informs us that the Kew specimen of *Sintenis 3833* is not this species; its occurrence in Porto Rico is therefore in doubt; we failed to find it at Lake Guanica.

9. ***Eleocharis yunquensis*** Britton, sp. nov.

Perennial by filiform rootstocks 7 cm. long or less; culms filiform, weak, 15 cm. long or less, very numerous, forming dense light green mats up to 2.5 dm. in diameter or patches 1 m. broad or more; spikelet oblong, acute, terete, 5–7 mm. long, much thicker than the culm; scales several, oblong, acute, keeled, dark brown; bristles about 6, white, unequal, the longer ones nearly as long as the achene and tubercle; achene obovoid, turgid, black, shining, the conic tubercle sharply acute, about one-third as long as the achene; style-branches 2.

Catalina-El Yunque Trall, Sierra de Luquillo, about 1,000 m. altitude (*Britton and Bruner 7619*). Endemic.

10. ***Eleocharis retroflexa*** (Poir.) Urban, Symb. Aut. 2: 165. 1900.

Scirpus retroflexus Poir. in Lam. Encycl. 6: 753. 1804.

Eleocharis Chaetaria R. & S. Syst. 2: 154. 1817.

Rootstock filiform, short or none; culms filiform-setaceous, weak, 2–20 cm. long, sometimes proliferous and rooting at the tip, the upper sheath oblique, somewhat inflated. Spikelet oblong, 2–4 mm. long, about 1.5 mm. thick, few-flowered; scales pale, sometimes purplish, oblong-lanceolate, 1.5–2 mm. long; bristles as long as the achene, or shorter, or wanting; style 3-cleft; achene obovoid, trigonous, nearly white, cancellate; tubercle brown, pyramidal, acute, nearly half as long as the achene.

Wet banks, rills and in mud, Porto Rico, ascending into the higher mountains; St. Thomas:—southeastern United States; Cuba to Trinidad; continental tropical America and Old World tropics. Porto Rico is the type locality.

11. ***Eleocharis microcarpa*** Torr. Ann. Lyc. N. Y. 3: 312. 1836.

Eleocharis minima Kunth, Enum. 2: 139. 1837.

Annual, with fibrous roots, culms capillary, tufted, 5–20 cm. long, the upper sheath with a triangular-lanceolate tooth. Spikelet ovoid to ovoid-oblong, 2–3 mm. long, 1.5 mm. thick, several-flowered, obtuse or bluntly pointed; scales pale, ovate to oblong, obtuse or acutish; bristles 3–5, somewhat shorter than the achene or wanting; style 3-cleft; achene grayish-white, trigonous, obovoid, about 0.5 mm. long, smooth or nearly so; tubercle conic, acute, much shorter than the achene.

Krumbay, St. Thomas (according to Clarke):—southeastern United States; Cuba; continental tropical America.

12. ***Eleocharis geniculata*** (L.) R. & S. Syst. 2: 150. 1817.

Scirpus geniculatus L. Sp. Pl. 48. 1753.

Perennial by short stout rootstocks; culms stout, 3–10 dm. high, 4–10 mm. thick, transversely pseudoseptate, constricted under the spikelet. Upper sheath truncate, often dark-margined; spikelet 1–3 cm. long, 4–9 mm. thick, considerably thicker than the upper part of the culm, densely many-flowered; scales blunt, ovate; bristles 7 or 8, reddish, retrorsely barbed, longer than the achene; style 3-cleft; achene 1–1.5 mm. long, ellipsoid, yellowish-brown, trigonous; tubercle conic, acute, about half as long as the achene.

Wet grounds at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; Martinique; Mexico to Paraguay.

13. **Eleocharis pachystyla** (C. Wright) Clarke in Urban, Symb. Ant. 2: 72. 1900.

Scirpus pachystylus C. Wright; Sauv. Ann. Acad. Habana 8: 79. 1871.

Perennial by stout rootstocks; culms rather slender, 4-6 dm. tall; upper sheath oblique at the herbaceous apex. Spikelet obovoid, densely several-flowered, obtuse, 6-7 mm. long, 3-4 mm. thick; scales elliptic, obtuse, brown with whitish margins, the lower one larger than the others; bristles 6, retrorsely scabrous, brown, longer than the achene; style 3-cleft; achene obovoid, sharply trigonous, brown, about 1 mm. long, one-half to two-thirds as long as the scale; tubercle long-conic, nearly half as long as the achene.

Wet white sand near Dorado, March, 1922, collected in flower only:—Cuba; Trinidad; Costa Rica to Venezuela.

4. **STENOPHYLLUS** Raf. Neog. 4. 1825.

Mostly annual sedges, with slender erect culms, leafy below, the leaves narrowly linear or filiform, with ciliate or pubescent sheaths. Spikelets umbellate, capitate or solitary, subtended by a 1-several-leaved involucre, their scales spirally imbricated all around, mostly deciduous. Flowers perfect. Perianth none. Stamens 2 or 3. Style 2-3-cleft, glabrous, its base much swollen and persistent as a tubercle on the achene as in *Eleocharis*. Achene 3-angled, turgid or lenticular. [Greek, referring to the narrow leaves.] A genus of some 20 species, natives of temperate and warm regions. Type species: *Scirpus stenophyllus* Ell.

Spikelets in umbellate heads.

Spikelet solitary, subtended by a filiform bract.

1. *S. vestitus*.

2. *S. portoricensis*.

1. **Stenophyllus vestitus** (Kunth) Britton, Bull. Torr. Club 43: 446. 1916.

Isolepis vestita Kunth, Enum. 2: 210. 1837.

Bulbostylis vestita Kunth; Clarke in Urban, Symb. Ant. 2: 87. 1900.

Annual, with fibrous roots; culms tufted, very slender, 2-3 dm. long, erect, finely pilose. Leaves setaceous, shorter than the culm, densely pilose; inflorescence umbellate or capitate; rays of the umbel filiform, 2 cm. long or less; spikelets sessile, fascicled in 3-12, oblong, 5-8 mm. long; scales ovate, dark brown, keeled, mucronate-aristate; style 3-cleft; achene obovoid, brownish, finely reticulated.

Mountain woods and slopes near Mayaguez:—Cuba; continental tropical America. Erroneously recorded by Urban as *Bulbostylis hirtella*, a species with stalked spikelets, from continental tropical America.

2. **Stenophyllus portoricensis** Britton, Torreya 13: 216. 1913.

Densely tufted, perennial. Culms setaceous, slightly roughened, weak, spreading, glabrous, 2 dm. high or less, longer than the similar leaves; leaf-sheaths loosely pilose; spikelet solitary, linear, 5-8 mm. long, subtended by a filiform or setaceous bract 1-3 cm. long; lowest scale ovate, acute, 1 mm. long, the others lanceolate, acuminate, 2.5-3 mm. long; achene narrowly oblong-obovate, bluntly 3-angled with faces somewhat sunken, thickest a little above the middle, 1.3 mm. long, 0.5 mm. thick, irregularly roughened, tipped by a broad tubercle about 1.5 mm. high and wide.

Rocky coastal thicket near Guanica. Endemic.

5. **FIMBRISTYLIS** Vahl, Enum. 2: 285. 1805.

Annual or perennial sedges. Culms leafy below. Spikelets umbellate or capitate, terete, several to many-flowered, subtended by a 1-many-leaved involucre, their scales spirally imbricated all around, mostly deciduous, all fertile.

Perianth none. Stamens 1-3. Style 2-3-cleft, pubescent or glabrous, its base much enlarged, falling away from the summit of the achene at maturity. Achene lenticular, biconvex, or 3-angled, reticulated, cancellate or longitudinally ribbed or striate in our species. [Greek, in allusion to the fringed style of some species.] A large genus, the species widely distributed in temperate and tropical regions. Type species: *Fimbristylis acuminata* Vahl.

A. Style-branches 2; achene lenticular.

Achene smooth, or cancellate, not ribbed.

Leaves long, mostly half as long as the culm or more.

Leaves involute.

Leaves flat.

Leaves much shorter than the culm.

Scales of the spikelet puberulent.

Scales of the spikelet glabrous.

Achene longitudinally ribbed and reticulated.

B. Style-branches 3; achene trigonous.

Spikelets linear to linear-oblong.

Spikelets globose or subglobose.

1. *F. spadicca*.
2. *F. inaguensis*.
3. *F. ferruginea*.
4. *F. spathacea*.
5. *F. diphylla*.
6. *F. complanata*.
7. *F. millacea*.

1. ***Fimbristylis spadicca*** (L.) Vahl, Enum. 2: 294. 1806.

Scirpus spadicceus L. Sp. Pl. 51. 1753.

Perennial; culms rather slender, stiff and wiry, erect, 1 m. high or less. Basal leaves elongated, involute-margined, half as long as the culm or more, their bases broadened, brown and shining, subdistichous, those of the involucre 3 or 4, the longer ones mostly surpassing the simple or compound umbel; spikelets oblong or oblong-cylindric, 8-15 mm. long, about 4 mm. thick; scales ovate, brown, smooth, shining, apiculate; style 2-cleft; achene obovate, half as long as the scale, biconvex, cancellate.

Coastal sands and marshes, Porto Rico; St. Thomas; St. Croix;—Jamaica; Cuba; Hispaniola; Anguilla; Martinique; Grenada; Trinidad; continental tropical America.

2. ***Fimbristylis inaguensis*** Britton, Torreya 13: 216. 1913.

Perennial by short stout rootstocks; culms rather stout, stiff, smooth, compressed, 3-5 dm. tall. Basal leaves one-third to two-thirds as long as the culm, flat, rather stiff, smooth, 1-2.5 mm. wide, obtuse; leaves of the involucre 2-4, the longer one usually a little exceeding the inflorescence; umbel compound, 5-7 cm. broad, the rays 2-4 cm. long, ascending, the raylets slender, 0.5-2 cm. long; spikelets narrowly oblong, 8-12 mm. long, about 2.5 mm. thick, acute, many-flowered, solitary at the ends of the rays and raylets; scales brown, glabrous, dull, ovate, carinate, mucronate or the lower short-awned; achene elliptic or obovate-elliptic, flat, blunt, finely reticulated, nearly 1.5 mm. long; style-branches 2.

On the sandy plain, Anegada;—Bahamas; Cuban Cays.

3. ***Fimbristylis ferruginea*** (L.) Vahl, Enum. 2: 291. 1805.

Scirpus ferrugineus L. Sp. Pl. 50. 1753.

Perennial; culms rather slender, clustered, 2-8 dm. long. Basal leaves very much shorter than the culm, those of the involucre 2-4, short, the longer ones sometimes exceeding the small compact umbel, but usually shorter; spikelets few, rarely solitary, ovoid-oblong, 8-20 mm. long, 3-4 mm. thick; scales ovate, acutish or mucronulate, brownish, dull, pilose-puberulent toward the apex; style 2-cleft; achene about one-half as long as the scale, obovate, biconvex, brownish, smooth.

Coastal marshes and sands, Porto Rico; Icaos; Vieques; St. Croix; St. Thomas; St. Jan. Tortola; Virgin Gorda;—West Indies; tropical continental America; Old World tropics and subtropics.

4. *Fimbristylis spathacea* Roth, Nov. Pl. Sp. 24. 1821.

Scirpus glomeratus Retz. Obs. 4: 11. 1786.

Scirpus obtusifolius Griseb. Fl. Br. W. I. 571. 1864.

Fimbristylis Sintinisii Boeckl. Bot. Jahrb. 7: 276. 1886.

Fimbristylis glomcrata Urban, Symb. Ant. 2: 166. 1900. Not *F. glomerata* Nees. 1834.

Perennial; culms tufted, stiff, erect, rather slender, 1-4 dm. high. Basal leaves flat, stiff, much shorter than the culm, 1.5-3 mm. wide, spreading or ascending, the apex bluntish and mucronate; involueral leaves few, mostly shorter than the compound small dense umbel; spikelets ellipsoid to short-cylindric, 3-6 mm. long, about 2 mm. thick; scales ovate, brownish, glabrous, emarginate, scarious-margined; style 2-cleft; achene about one-half as long as the scale, biconvex, obovate, brown, granular or subtuberculate.

Moist or wet soil at lower elevations, Porto Rico; Mona;—Bahamas; Jamaica; Cuba; Hispaniola; St. Kitts; Antigua; Guadeloupe; continental tropical America and Old World tropics.

5. *Fimbristylis diphylla* (Retz.) Vahl, Enum. 2: 289. 1805.

Scirpus diphyllus Retz. Obs. 5: 15. 1789.

Fimbristylis polymorpha Boeckl. Linnaea 37: 14. 1871.

Perennial; glabrous or more or less pubescent; culms tufted, slender, 1-6 dm. high. Leaves 1-3 mm. wide, flat, the basal ones shorter than the culm, those of the involucre 3 or 4, not elongated; umbel simple or compound, loose, sometimes 6 cm. broad, the rays very slender; spikelets oblong to ovoid, 5-10 mm. long, 2.5-4 mm. thick; scales ovate, glabrous, acute; style 2-cleft; achene obovate, biconvex, about one-third as long as the scale, strongly longitudinally ribbed and reticulated, the ribs more or less tubercled. [Not *Fimbristylis annua* (All.) R. & S. of the Old World.]

Grassy places at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—southern United States; West Indies; continental tropical America and Old World tropics.

6. *Fimbristylis complanata* (Retz.) Link, Hort. Berol. 1: 292. 1827.

Scirpus complanatus Retz. Obs. 5: 14. 1789.

Glabrous; culms slender, tufted, 2-6 dm. high, somewhat angled above. Leaves 2-6 mm. wide, the basal ones shorter than the culm, those of the involucre mostly 2 and shorter than the inflorescence; umbel compound or decomposed, the spikelets in small umbellets, the central one sessile, the others peduncled, linear or linear-oblong, 5-10 mm. long, 1-2 mm. wide; scales brown, ovate to lanceolate, keeled; style-branches 3; style glabrous; achene obovoid, trigonous, yellow-brown, transversely striate and minutely tubercled.

In moist or wet grassy places, Porto Rico, ascending into the eastern mountains;—Jamaica; Cuba; Hispaniola; Dominica to Trinidad; continental tropical America and Old World tropics.

7. *Fimbristylis miliacea* (L.) Vahl, Enum. 2: 287. 1805.

Scirpus miliaceus L. Syst. ed. 10, 868. 1759.

Annual with fibrous roots; culms weak, tufted, 7 dm. long or less, angled above. Leaves soft, 1.5-4 mm. wide, the basal ones usually about half as long as the culm, long attenuate at the apex, those of the involucre similar, but much shorter and narrower, shorter than the loose, large, decomposed umbel; spikelets subglobose, 2-4 mm. long, their lower scales early deciduous; scales ovate, the midvein broad; style-branches 3; style villous; achene obovoid, trigonous, brownish, minutely tuberculate, less than 1 mm. long.

Sandy shore, Yabucoa;—Florida; California; Cuba; tropical continental America; Old World tropics.

Fimbristylis divaricata Hamilt. Prodr. 14. 1825.

A species described as from Porto Rico, the specimen in the herbarium of Desvaux, with pilose culms and divaricate branches; it has not been identified by modern botanists; the published description is incomplete.

Fimbristylis hirtella Hamilt. Prodr. 14. 1825.

Fimbristylis Hamiltonii Steud. Syn. Pl. Cyp. 119. 1855.

A species also described from Porto Rico, the specimen in the herbarium of Desvaux, not identified by modern botanists, the description being incomplete.

6. **ABILDGAARDIA** Vahl, Enum. 2: 296. 1805.

Low, perennial or annual sedges, with slender culms, narrow or setaceous basal leaves, the involucre usually of 1 small bract, the flattened spikelets solitary or few together, several-many-flowered. Scales imbricated in 2 rows, keeled, deciduous. Bristles none. Stamens 1-3. Style pubescent, deciduous, its base swollen. Stigmas 3. Achene trigonous. [Commemorates P. S. Abildgaard, Danish botanist.] About 15 species of tropical and subtropical distribution, the following typical.

1. **Abildgaardia monostachya** (L.) Vahl, Enum. 2: 296. 1805.

Cyperus monostachyos L. Mant. 180. 1771.

Fimbristylis monostachya Hassk. Pl. Jav. Rar. 61. 1848.

Perennial, glabrous; culms very slender, smooth, tufted, 4 dm. high or less. Leaves setaceous, 0.5 mm. wide, about one-half as long as the culms, the involucre one rarely as long as the spikelet; spikelet ovate or ovate-lanceolate, many-flowered, 1-1.5 cm. long, about 5 mm. wide; scales ovate, keeled, mucronate, pale greenish-brown with white margins; style villous, with 3 short branches; achenes 2-2.5 mm. long, constricted near the base, yellowish, tuberculate.

Sterile grassy situations and in mud at lower elevations, Porto Rico; St. Jan; Anegada; —Florida; West Indies; continental tropical America and Old World tropics.

7. **SCIRPUS** [Tourn.] L. Sp. Pl. 47. 1753.

Annual or perennial very small, or very large sedges, with leafy culms or the leaves reduced to basal sheaths. Spikelets terete or somewhat flattened, solitary, capitate, spicate or umbellate, subtended by a 1-several-leaved involucre or the involucre wanting in some species. Scales spirally imbricated all around, usually all fertile, the 1-3 lower sometimes empty. Flowers perfect. Perianth of 1-6, slender or rigid, short or elongated, barbed, pubescent or smooth bristles, or none in some species. Stamens 2-3. Style 2-3-cleft, not swollen at the base, wholly deciduous from the achene, or its base persistent as a subulate tip. Achene triangular, lenticular or plano-convex. [Latin name of the Bulrush, said to be from *sirs*, the Celtic word for rushes.] About 200 species of very wide geographic distribution, known as BULRUSH. Type species: *Scirpus lacustris* L.

Spikelets umbellate, terminal; culm terete.
Spikelets glomerate, appearing as if lateral; culm trigonous.

1. *S. validus*.
2. *S. Olneyi*.

1. **Scirpus validus** Vahl, Enum. 2: 268. 1805.

Perennial by stout rootstocks; culms stout, smooth, terete, erect, 1-3 m. tall, sheathed at the base. Involucral-bract 1, erect, shorter than the umbel, appearing as if continuing the culm; umbel compound, its primary rays slender, 1-6 cm. long; spikelets several or many, oblong-conic, 1 to 5 together, 5-12 mm. long, 3-4 mm. thick; scales ovate, short-tipped; bristles 4-6, downwardly barbed, as long as the achene or longer; stamens 3; style 2-cleft; achene obovate, plano-convex, mucronate. [Included by authors in the Old World species *Scirpus lucustris* L.]

Banks of streams in the vicinity of Guanica—continental North America; Bermuda; Bahamas; Cuba; Hispaniola; Jamaica.

2. **Scirpus Olneyi** A. Gray, Bost. Journ. Nat. Hist. 5: 238. 1845.

Perennial by long rootstocks; culms stout, or rather slender, erect, smooth, sharply 3-angled with concave sides, 2-7 dm. tall. Leaves 1-3, 2-13 cm. long, or sheaths sometimes leafless; spikelets capitate in dense clusters of 5-12, oblong or ovoid-oblong, obtuse, 5-8 mm. long, the solitary involucral leaf short, stout, erect, 1-3 cm. long; scales oval or orbicular, dark brown with a green midvein, emarginate or mucronulate, glabrous; bristles usually 6, slightly shorter than or equalling the achene, downwardly barbed; stamens 2-3; style 2-cleft; achene obovate, plano-convex, brown, mucronate.

Wet grounds, Santurce;—coasts of continental temperate and tropical North America; Bermuda; Cuba; Hispaniola.

Scirpus subdistichus Boeckl. Linnaea 36: 490. 1869.

Isolepis disticha Boeckl. Flora 41: 415. 1858.

A species recorded as collected by Bertero on St. Thomas and not otherwise known. After an examination of scanty material, Mr. C. B. Clarke thought it might, perhaps, represent *Scirpus cernuus* Vahl, a plant not known to occur in the West Indies.

Scirpus articulatus (Kunth) Griseb., an Old World species, is recorded from St. Croix by Kunth, and by Krebs from St. Thomas, presumably erroneously. [*Isolepis articulata* Nees.]

8. **FUIRENA** Rottb. Descr. & Icon. 70. 1773.

Perennial sedges, with leafy triangular culms (in a Florida species the leaves reduced to inflated sheaths), and many-flowered terete spikelets in terminal and axillary clusters, or rarely solitary. Scales spirally imbricated, awned, the 1 or 2 lower commonly empty. Flowers perfect. Perianth of 3 ovate oblong or cordate-ovate, stalked, often awned sepals, usually alternating with as many downwardly barbed bristles. Stamens 3. Style 3-cleft, not swollen at the base, deciduous. Achene stalked or nearly sessile, sharply 3-angled, acute or mucronate, smooth. [In honor of Georg Fuiren, 1581-1628, Danish physician.] About 20 species, natives of warm-temperate and tropical regions. Type species: *Fuirena umbellata* Rottb.

Spikelets in 1-5 heads; plant with fibrous roots. 1. *F. squarrosa*.
Heads of spikelets numerous, panicled; plants perennial by rootstocks. 2. *F. umbellata*.

1. **Fuirena squarrosa** Michx. Fl. Bor. Am. 1: 37. 1803.

Roots fibrous; culms tufted, glabrous or nearly so, 5-20 cm. tall. Leaves flat, nearly or quite glabrous or the lower sheaths pubescent; spikelets sessile, 1-10 together in capitate clusters, ovoid or ovoid-oblong, 6-12 mm. long, about

5 mm. in diameter; scales ovate or oblong, brown, pubescent, mostly obtuse, 3-nerved, tipped with a stout spreading or recurved awn of nearly their own length; sepals oblong, long-stalked, usually narrowed at both ends, the awn downwardly barbed or sometimes smooth; bristles mostly longer than the achene. [*Pteroscleria longifolia* Bello, not Griseb.]

Western Porto Rico. Determined by Clarke from a drawing by Consul King; otherwise unknown from the island:—eastern United States; Cuba; recorded from Jamaica.

2. **Fuirena umbellata** Rottb. Descr. et Icon. 70. 1773.

Perennial by rootstocks; culms stout or rather slender, erect, trigonous, glabrous, or pilose above, 5–15 dm. high. Leaves flat, 7–16 cm. long, 5–25 mm. wide, glabrous or sparingly pilose, the lower ones often much shorter; panicles 1–4, terminal or also in the upper axils, rather dense, pilose; spikelets commonly numerous, oblong to linear-oblong, 6–10 mm. long, clustered, acutish; scales green-brown, pubescent, aristate, the awns spreading or recurved; sepals obovate, mucronate, nearly sessile, about as long as the smooth, trigonous, beaked achene.

Meadows and marshes at lower and middle altitudes, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; Margarita; continental tropical America and Old World tropics.

9. **DICHROMENA** Michx. Fl. Bor. Am. 1: 37. 1803.

Leafy-stemmed sedges, perennial by rootstocks, the spikelets crowded in a terminal head involucre by the upper leaves, which are often white at the base. Spikelets compressed, several-many-flowered. Scales spirally imbricated all around, several of them with imperfect flowers, or empty. Perianth none. Stamens 3. Style 2-cleft, its branches subulate. Achene lenticular, transversely rugose, crowned with the broad persistent base of the style (tubercle). [Greek, alluding to the two-colored involucre leaves.] About 8 species, natives of America. Type species: *Dichromena leucoccephala* Michx.

Involucral leaves glabrous.

1. *D. colorata*.

Involucral leaves pubescent or ciliate toward the base.

2. *D. ciliata*.

Spikelets mostly subspiculate; scales white.

3. *D. radicans*.

Spikelets 1–5, digitate; scales brownish.

1. **Dichromena colorata** (L.) Hitchc. Rep. Mo. Bot. Gard. 4: 141. 1893.

Schoenus coloratus L. Sp. Pl. 43. 1753.

Dichromena leucoccephala Michx. Fl. Bor. Am. 1: 37. 1803.

Glabrous; culm slender, erect, rather sharply triangular, 0.3–0.6 m. tall. Leaves distant, narrowly linear, about 2 mm. wide, much shorter than the culm, those of the involucre 4–6, reflexed when mature, yellowish white at the base; head globose, 1–2 cm. in diameter; spikelets narrowly oblong, acute; scales membranous, lanceolate, nearly white, 1-nerved, subacute at the apex; achene obovate, brown, nearly truncate at the summit, compressed, covered by the tubercle which is not decurrent on its edges.

Wet grassy places at lower elevations, Porto Rico:—eastern and southern United States to Mexico; Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe and Martinique.

2. **Dichromena ciliata** Vahl, Enum. 2: 240. 1805.

Dichromena pura Nees, Linnaea 9: 291. 1834.

Rynchospora pura Griseb. Fl. Br. W. I. 577. 1864.

Perennial by short rootstocks; culms slender, 7 dm. tall or less, 3-angled. Leaves pubescent or glabrate, mostly shorter than the culm, flat, grass-like, 2–4 mm. wide, those of the involucre 4–6, similar to the lower ones, but ciliate-

pilose towards the usually whitened base; spikelets 3-15, subspicate or capitate, 6-7 mm. long; scales white, keeled, obtusish; achene broadly obovate to suborbicular, 1-1.5 mm. long, transversely undulate; tubercle ovoid-lanceolate or depressed, one-fourth to two-thirds as long as the achene.

Grassy places at lower and middle elevations, Porto Rico, ascending into the Luquillo Mountains; Vieques; St. Thomas; St. Jan.—West Indies, (except Bahamas); continental tropical America. Spikelets sometimes proliferous.

3. **Dichromena radicans** Schl. & Cham. *Linnaea* 6: 28. 1831.

Somewhat pubescent; rootstock slender, or very short; roots fibrous. Culms slender, 1.5-6 dm. long; leaves narrowly linear, 1.5-4 mm. wide, shorter than the culm, those of the involucre 2-5, similar to the lower ones but shorter, spreading, ciliate-pilose at the base, green throughout or sometimes a little whitish below; spikelets 1-3, cinnamon-brown, acute or obtusish, 7-12 mm. long; culm often proliferous at the summit, reclining and radican; achene obovate, 1-1.5 mm. long, brown, delicately transversely undulate, the low tubercle decurrent on its edges.

Forests, shaded banks and hillsides at middle and higher elevations, Porto Rico; St. Thomas; Tortola.—Jamaica; Cuba to Trinidad; continental tropical America.

10. **PSILOCARYA** Torr. *Ann. Lyc. N. Y.* 3: 359. 1836.

Annual sedges, with fibrous roots, slender leafy stems and ovoid or oblong, many-flowered terete spikelets in terminal and axillary, mostly compound umbels, the rays and raylets bracted at the base. Scales of the spikelets spirally imbricated all around, deciduous. Flowers perfect. Perianth or bristles none. Stamens 1 or 2. Style 2-cleft, enlarged at the base. Achene lenticular or biconvex, smooth or transversely wrinkled, capped by the persistent base of the style (tubercle), or nearly the whole style persistent as a beak. [Greek, referring to the absence of perianth-bristles.] About 10 species, natives of temperate and tropical America. Type species: *Psilocarya scirpoides* Torr.

1. **Psilocarya portoricensis** Britton, *Bull. Torr. Club* 42: 387. 1915.

Annual, with fibrous roots; culm rather slender, about 4 dm. high; leaves shorter than the culm, 2-3 mm. wide; umbels several, slender-stalked; spikelets 3-5 in the umbels, ovoid, acutish, 4-6 mm. long, 2 mm. thick; scales ovate, dark brown, sharply acute; style rather deeply 2-cleft; achene oblong, 1 mm. long, transversely wrinkled; tubercle triangular, acute, one-third to one-half as long as the achene, and distinctly decurrent upon it.

Shore of Laguna Tortuguero. Endemic.

11. **RYNCHOSPORA** Vahl, *Enum.* 2: 229. 1805.

Leafy sedges, mostly perennial by rootstocks, with erect 3-angled or terete culms, narrow flat or involute leaves, and ovoid oblong or fusiform, variously clustered spikelets. Scales thin, 1-nerved, imbricated all around, usually mucronate by the excurrent midvein, the lower empty. Upper flowers imperfect, the lower perfect. Perianth of 1-20 (mostly 6) upwardly or downwardly barbed or scabrous bristles, wanting in some species. Stamens commonly 3. Style 2-cleft, 2-toothed or rarely entire. Achene lenticular or swollen, not 3-angled, smooth or transversely wrinkled, capped by the persistent base of the style (tubercle), or in some species by the whole style. [Greek, referring to the beak-

like tubercle.] About 200 species, of wide distribution, most abundant in warm regions, known as BEAKED-RUSH. Type species: *Rynchospora aurea* Vahl.

- A. Style long, its branches much shorter than the undivided part.
Spikelets densely capitate, the heads corymbose-paniculate. 1. *R. cyperoides*.
Spikelets not densely capitate. (See No. 3.)
Bristles as long as the achene or longer.
Spikelets fascicled in 2's-6's; achene not sulcate. 2. *R. corymbosa*.
Spikelets fascicled in 12's-20's; achene 1-2-sulcate. 3. *R. gigantea*.
Bristles obsolete or none.
Spikelets fascicled; sheaths glabrous. 4. *R. elongata*.
Spikelets loosely clustered; sheaths pubescent. 5. *R. jamaicensis*.
- B. Style short, its branches mostly as long as the undivided part.
(See No. 14.)
a. Perianth-bristles none.
*Achene transversely wrinkled.
Plant pilose; spikelets with 3 achenes. 6. *R. trichodes*.
Plants glabrous; spikelets with only 1 or 2 achenes.
Plant tall, stout, 1 m. high or less. 7. *R. rufa*.
Plants low or slender, 5 dm. high or less.
Spikelets only 1-2 mm. long. 8. *R. micrantha*.
Spikelets 3-6 mm. long.
Achene 3-toothed at the top. 9. *R. setacea*.
Achene not 3-toothed.
Plant low; spikelets clustered in 2's-6's. 10. *R. Berterii*.
Plants slender; spikelets peduncled, mostly
panicled.
Spikelets about 4 mm. long. 11. *R. tenuis*.
Spikelets about 2 mm. long. 12. *R. Bruneri*.
- **Achene smooth.
Spikelets narrowly lanceolate, 8-12 mm. long.
Spikelets oblong, about 3 mm. long. 13. *R. filiformis*.
14. *R. Blauneri*.
- b. Perianth-bristles present.
*Perianth-bristles retrorsely barbed. 15. *R. luquillensis*.
**Perianth-bristles upwardly barbed.
†Achene smooth.
Leaves flat, grass-like, 1-3 mm. wide. 16. *R. distans*.
Leaves setaceous, about 0.5 mm. wide. 17. *R. Wrightiana*.
‡Achene transversely wrinkled.
†Achene not stipitate; bristles not plumose at base.
Bristles shorter than the achene. 18. *R. cymosa*.
Bristles as long as the achene or longer.
Leaves 2-4 mm. wide.
Spikelets 3 mm. long; tubercle half as long
as the achene or less. 19. *R. glauca*.
Spikelets 5 mm. long; tubercle nearly as
long as the achene. 20. *R. borinquensis*.
Leaves only 1 mm. wide or less. 21. *R. bahamensis*.
‡‡Achene stipitate; bristles plumose at base. 22. *R. Marisculus*.

1. ***Rynchospora cyperoides*** (Sw.) Mart. Denkschr. Akad. Wiss. Muench. 6: 149. 1816-17.

Schoenus cyperoides Sw. Prodr. 19. 1788.

Rynchospora polycephala Wydler; Kunth, Enum. 2: 291. 1837.

Rootstocks short; culms clustered, sharply trigonous, rather stout, glabrous, 4-8 dm. tall. Leaves 3-5 mm. wide; heads of spikelets dense, globose, 8-12 mm. in diameter, corymbose-paniculate, sometimes few; spikelets with about 7 scales, only one of them achene-bearing; bristles 6, rigid, upwardly barbed, longer than the achene; style long, 2-cleft above; achene obovoid, narrowed below, about 1 mm. long, faintly transversely undulate; tubercle subulate, ciliate.

Wet grounds at lower and middle elevations, Porto Rico, ascending into the Luquillo Mountains;—West Indies; continental tropical America; tropical Africa.

2. ***Rynchospora corymbosa*** (L.) Britton, Trans. N. Y. Acad. Sci. 11: 84. 1892.

Scirpus corymbosus L. Cent. 2: 7. 1756.

Rynchospora aurea Vahl, Enum. 2: 229. 1805.

Rootstocks stout; culms stout, glabrous, trigonous, roughish, 8-12 dm. tall. Leaves elongated, rough-margined, 8-15 mm. wide; inflorescence large, often 3 dm. long, corymbose-paniculate, the lower corymbs often distant; spikelets clustered in 2's-6's, or solitary, 6-10 mm. long, bearing but one achene; scales bright brown, ovate, obtuse, mucronate; bristles 6, rough, longer than the

achene; style nearly undivided; achene oblong-obovate, about 3 mm. long, smooth or somewhat wrinkled; tubercle long-conic, sulcate on both sides.

Wet grounds at lower elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; Trinidad; continental tropical America and Old World tropics.

3. *Rynchospora gigantea* Link, Jahrb. 3: 76. 1820.

Culms very stout, smooth, sharply trigonous, 1–2 m. high or more. Leaves elongated, roughish-margined, 1–2 cm. wide; inflorescence corymbose-paniculate, the corymbs approximate, or the lower distant; spikelets about 8 mm. long, glomerate, bearing but one achene; scales bright brown, ovate; bristles 6, roughish above, about as long as the achene and tubercle; achene oblong-obovate, 1–2-sulcate, somewhat rugose, 2–3 mm. long; tubercle conic, sulcate, about as long as the achene; style long.

Wet grounds at lower elevations, Porto Rico:—Cuba; South America.

4. *Rynchospora elongata* Boeckl. Cyp. Nov. 1: 26. 1888.

Culms slender, smooth, 6 dm. long or less, weak, bluntly 3-angled. Leaves smooth, 2–3 mm. wide, elongated, but mostly shorter than the culm; inflorescence of 2–5 small, distant, lateral, rather dense corymbs; spikelets lanceolate, clustered, about 4 mm. long, bearing but one achene; scales brown, ovate, acutish, or the lower ones mucronate; bristles none; style elongated, shortly 2-cleft near the summit; achene oblong-obovate, smooth, about as long as the conic tubercle.

Top of Mt. Yunque, Sierra de Luquillo:—Cuba; Jamaica.

5. *Rynchospora jamaicensis* Britton, Bull. Torr. Club 41: 1. 1914.

Rootstocks short; culms clustered, slender, 6–8 dm. long, reclining. Leaves 2–3 mm. wide, rather stiff, the lower 2–5 cm. long, the middle ones 12–15 cm. long, those subtending the clusters of spikelets 6–10 cm. long; sheaths of all the leaves densely short-pubescent; spikelets loosely paniced in several distant axillary clusters and in a terminal one, short-pedicelled, the axis of the inflorescence loosely pubescent; spikelets narrowly conic, 4–5 mm. long, maturing 2 achenes; lower empty scales broadly ovate, the others lanceolate, acuminate; bristles none; achenes obovate-orbicular, 1 mm. long, pale brown, shining, finely cancellate; tubercle triangular-lanceolate, acuminate, flat, about one-third longer than the achene, its base nearly truncate; style long.

Alta de la Bandera, collected by F. L. Stevens in 1915:—Jamaica.

6. *Rynchospora trichodes* Clarke in Urban, Symb. Ant. 2: 116. 1900.

Schoenus hispidulus Vahl, Enum. 2: 219. 1805.

Fimbristylis hirsuta Hochst.: Steud. Syn. Pl. Cyp. 116. 1855. Not *R. hirsuta* Vahl.

Rynchospora hispidula Boeckl. Linnaea 37: 604. 1873. Not Griseb. 1866.

Roots fibrous; culm and leaves loosely pilose. Culm 4 dm. long or less, slender; leaves about 3 mm. wide, sometimes exceeding the culm; inflorescence of terminal and lateral corymbs 3–8 cm. in diameter; spikelets slender-peduncled, mostly solitary, ovoid, 4 mm. long, bearing about 3 achenes; scales ovate, brown, glabrous, obtuse; bristles none; style deeply 2-cleft; achene broadly obovoid, about one-third as long as the scale, biconvex, brownish, transversely wrinkled, the tubercle broad, depressed, decurrent.

Represented in the Delessert Herbarium, Geneva, Switzerland, by a specimen indicated in the handwriting of Salzmann as from Porto Rico. The species is otherwise known from northern South America.

7. *Rynchospora rufa* (Nees) Boeckl. Vidensk. Medd. Kjob. 1869: 149. 1870.

Psilocaryu rufa Nees in Mart. Fl. Bras. 2: 117. 1842.

Perennial by rootstocks; culms rather stout, glabrous, 5–10 dm. high. Leaves long, flat, about 3 mm. wide; inflorescence corymbose-paniculate, the spikelets numerous; bracts linear, often pilose; spikelets 6–7 mm. long, containing only 1 achene or rarely 2, often barren, mostly sessile in clusters of 2–4; scales

brown, the lower ovate, cuspidate, the upper lanceolate, acute; bristles none; style-branches long, filiform; achene broadly obovate, transversely wrinkled, about 1.5 mm. long; tubercle about as long as the achene, with a broad base.

Marsh, Martín Peña:—Cuba; continental tropical America.

8. **Rynchospora micrantha** Vahl, Enum. 2: 231. 1805.

Juncus parviflorus Poir, in Lam. Encycl. Suppl. 3: 160. 1813.

Dichromena micrantha Kunth, Enum. 2: 278. 1837.

Annual, with fibrous roots; culms slender, glabrous, tufted, weak, 1–4 dm. long. Leaves 2–3 mm. wide, thin, shorter than the culm; corymbs several, loose, filiform-rayed; spikelets ovoid, 1–2 mm. long, bearing a single achene; scales ovate-lanceolate, acute; bristles none; style deeply 2-cleft; achene obovoid, less than 1 mm. long, biconvex, transversely wrinkled; tubercle depressed.

Wet grassy places at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Antigua to Grenada; continental tropical America; west tropical Africa.

9. **Rynchospora setacea** (Berg.) Boeckl. Vidensk. Medd. Kjob. 1869: 159. 1870.

Schoenus setaceus Berg. Act. Helv. 7: 130. 1772.

Rynchospora tenerrima Spreng. Syst. Cur. Post. 26. 1827.

Rynchospora spermodon Griseb. Fl. Br. W. I. 576. 1864.

Annual with fibrous roots, glabrous; culms slender, mostly erect, tufted, 1–5 dm. high. Leaves only 1–1.5 mm. wide, usually shorter than the culm; corymbs several; distant, small; spikelets clustered, about 4 mm. long, narrowly lanceolate, bearing 1 or 2 achenes; scales ovate-lanceolate, acute or mucronate; bristles none; style deeply 2-cleft; achene obovoid, biconvex, about 1 mm. long, much shorter than the subtending scale, transversely rugose, 3-toothed at the apex, the tubercle conic, forming the central tooth.

Wet sandy and grassy places at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Guadeloupe to Grenada; continental tropical America.

10. **Rynchospora Berterii** (Spreng.) Clarke in Urban, Symb. Ant. 2: 119. 1900.

Hypolytrum Berterii Spreng. Neue Entd. 1: 241. 1820.

Schoenus pusillus Sw. Prodr. 20. 1788.

Rynchospora pusilla Griseb. Kar. 123. 1857. Not Curtis, 1849.

Perennial by short stolons and a slender rootstock; culms nearly filiform, glabrous, weak, 2–10 cm. long. Leaves 1 mm. wide or less, often exceeding the culm, glabrous, or with pilose sheaths; spikelets 2–6 together in a usually solitary terminal cluster, lanceolate, 2–4 mm. long, bearing 1 or 2 achenes; scales lanceolate, acute, nearly white; bristles none; style-branches long; achene brown, orbicular-obovoid, about 1 mm. long, transversely wrinkled, the low tubercle conic.

Shaded grassy banks and hillsides at lower and middle altitudes, Porto Rico; St. Thomas (according to Eggers):—Jamaica; Cuba; Hispaniola; Guadeloupe.

11. **Rynchospora tenuis** Link, Jahrb. 3: 76. 1820.

Rootstocks short, slender; culms very slender, tufted, 1.5–4 dm. long, glabrous and smooth, erect or reclining. Leaves 0.5–2 mm. wide, as long as the culm or shorter; corymbs of spikelets 1–3, filiform-stalked; spikelets usually rather loosely clustered, about 4 mm. long, narrowly lanceolate, acute, pale, bearing a single achene; scales acute, the lower ovate, the upper lanceolate; bristles none; style deeply 2-cleft; achene obovate or nearly orbicular, sessile, transversely rugose, about 1 mm. broad; tubercle acute, one-fourth to one-half as long as the achene and decurrent on its margins.

Moist grounds near Dorado:—Bahamas; Cuba; Dominica; Guadeloupe; Martinique; St. Vincent; continental tropical America.

12. *Rynchospora Bruneri* Britten, sp. nov.

Glabrous, culms densely tufted, filiform, erect, stiff, 16 cm. high or less. Leaves filiform, much shorter than the culm; spikelets few in a terminal loose cluster and often in 2 or 3 distant lower clusters, brownish, narrowly oblong, 2-2.5 mm. long, bearing 1 achene; scales lanceolate, acute; bristles none; achene oblong, transversely striate, about 1 mm. long; tubercle broad, minutely tipped.

Rocky summit of El Yunque, Luquillo Mountains (*Britten and Bruner, 7630.*)

13. *Rynchospora filiformis* Vahl, Enum. 2: 232. 1805.

Rynchospora podosperma C. Wright; Sauvalle, Anales Acad. Habana 8: 87. 1871.

Rynchospora longispicata Boeckl. Linnæa 37: 600. 1873.

Perennial by slender rootstocks; culms glabrous, slender or nearly filiform, 4 dm. long or less. Leaves smooth, about 1 mm. wide, shorter than the culm; corymbs distant, loose, filiform-rayed; spikelets narrowly lanceolate, 8-12 mm. long, bearing 1 or 2 achenes; scales oblong-lanceolate or the lower ovate, cuspidate or acute, yellowish-brown; bristles none; style-branches long; achene brown, smooth, obovoid, truncate, stipitate, 1.5 mm. long, the short tubercle conic.

Porto Rico, collected by Ledru; St. Thomas;—Cuba; Trinidad; South America.

14. *Rynchospora Blauneri* Britton, Bull. Torrey Club 50: 56. 1923.

Perennial by short rootstocks; culms filiform, weak, clustered, glabrous, 3-5 dm. long; leaves filiform, glabrous, shorter than the culms; spikelets narrowly oblong, 3 mm. long, few together in 2 or 3 distant compact clusters subtended by a filiform bract 3-5 cm. long; scales ovate-oblong, acute, light brown; bristles none; achene obovate, light brown with darker brown margins, smooth, about 1 mm. long; tubercle conic, acute, about one-third as long as the achene.

Sierra de Luquillo (*Blauner 247*, in herbarium of Columbia University, collected in 1852-53). Referred by Clarke to *R. divergens*. Endemic.

Rynchospora alba (L.) Vahl, recorded from Porto Rico by Clarke, as illustrated by a specimen collected by Blauner (*no. 247*) preserved in the Candolle herbarium at Geneva, Switzerland, is manifestly an error in record or determination, the plant being restricted to the north temperate zone.

15. *Rynchospora luquillensis* Britton, Bull. Torrey Club 50: 56. 1923.

Perennial by rootstocks; culms very slender, smooth, erect, about 2 dm. high. Leaves narrowly linear, about 1 mm. wide, flat, smooth, shorter than the culm; inflorescence a small terminal cluster of few spikelets; spikelets narrowly oblong, about 4 mm. long; scales oblong, brownish, acute; bristles about 6, retrorsely barbed, a little longer than the achene; style elongated; achene narrowly obovate, smooth, brown, 1.6 mm. long; tubercle subulate, about as long as the achene.

Rocky summit of El Yunque, Sierra de Luquillo. Endemic.

16. *Rynchospora distans* (Michx.) Vahl, Enum. 2: 235. 1805.

Schoenus distans Michx. Fl. Bor. Am. 1: 36. 1803.

Roots of thick fibers; culms clustered, slender, glabrous, 3-8 dm. high. Leaves 1-3 mm. wide, smooth, flat, mostly shorter than the culm; corymbs 1-4, dense, distant, 0.5-1.5 cm. thick; spikelets about 4 mm. long, ovoid-lanceolate, usually bearing but 1 achene; scales brown, ovate, acute or cuspidate; bristles 5 or 6, upwardly barbed, as long as the achene and tubercle, or shorter, sometimes

only one-third as long as the achene; style-branches long; achenes smooth, brown, obovoid, biconvex, about one-half as long as the scale; tubercle sharply conic, one-third to one-half as long as the achene.

Wet sandy soil at lower elevations, Porto Rico:—southeastern United States; Bermuda; Hispaniola; Cuba; Jamaica; continental tropical America.

Porto Rican specimens cited by Clarke under *R. fascicularis* are better referred to *R. distans*.

17. **Rynchospora Wrightiana** Boeckl. Flora 64: 78. 1881.

Roots of nearly capillary fibres; culms tufted, nearly filiform, 2–4 dm. long, weak; leaves filiform, half as long as the culm or longer; corymbs solitary or sometimes 2, dense, 1 cm. broad or less; spikelets 3–10, ovoid, 4–5 mm. long, usually with but 1 achene; scales dark brown, acute, ovate; bristles upwardly barbed, short, or sometimes two-thirds as long as the achene; achene lenticular, brown, smooth, obovoid to obovoid-orbicular, about 2 mm. long, the triangular-conic tubercle short. [*R. pallida* Clarke, not Curtis.]

Sierra de Luquillo:—southeastern United States and Cuba.

18. **Rynchospora cymosa** Ell. Bot. S. C. & Ga. 1: 58. 1816.

Schoenus cymosus Muhl. Gram. 8. 1817.

Rootstock short, rather stout; culms slender, few or several together, 8 dm. tall or less. Leaves grass-like, smooth, 3–5 mm. wide, nearly flat, shorter than the culm; corymbs usually 2–4, slender-stalked, distant, filiform-rayed, 2–8 cm. broad; spikelets ovoid-oblong, sessile or nearly so, about 3 mm. broad, usually with but one achene; scales ovate, brown, acute or short-acuminate; bristles about 6, upwardly barbed, shorter than the achene; achene lenticular or nearly flat, obovoid, transversely wrinkled, 1.5 mm. long, tipped by the short conic tubercle.

Moist grassy places at lower and middle elevations, Porto Rico, ascending to 800 m.:—southeastern United States; Hispaniola; Cuba; Jamaica; Martinique; continental tropical America.

19. **Rynchospora glauca** Vahl, Enum. 2: 233. 1805.

Rootstocks short and thick; culms slender to rather stout, 3–9 dm. tall. Leaves flat, shorter than the culm, 2–4 mm. wide; corymbs 1–3, distant, loose, 1.5–3 cm. broad, slender-stalked; spikelets ovoid, about 3 mm. long, bearing 1 or 2 achenes; scales ovate, dark brown, acuminate; bristles about 6, upwardly barbed, as long as the achene or somewhat exceeding it; achene obovoid, lenticular, about 1.5 mm. long, transversely wrinkled, the conic acute tubercle one-third to one-half its length. [*R. gracilis* R. & S.]

Moist grounds and along streams, Porto Rico, ascending into mountain woodlands:—Hispaniola; Cuba; Jamaica; Trinidad; continental tropical America and Old World tropics.

Rynchospora miliacea (Lam.) A. Gray. [*R. sparsa* Vahl] of the southeastern United States and Cuba, with larger looser corymbs, the tubercle of the achene depressed and rounded, recorded as Porto Rican by Schultes, has not been found there by recent collectors.

20. **Rynchospora borinquensis** Britton, Bull. Torr. Club 42: 387. 1915.

Perennial by short rootstocks; culms slender, trigonous, about 6 dm. high. Leaves flat, about 2 mm. wide, shorter than the culm; corymbs 2 or 3, distant, filiform-stalked, compound, narrow, 2–7 cm. long; spikelets clustered, fusiform, 5 mm. long, narrowed at both ends, bearing only 1 achene; scales lanceolate or

oblong-lanceolate, dark brown, acute; bristles about 6, upwardly barbed, longer than the achene and tubercle; style-branches about one-third as long as the undivided part; achene oblong-obovate, faintly transversely wrinkled, 1.5 mm. long, a little longer than the smooth, conic, acute tubercle.

Open wet places in the forest, Rio leaco and adjacent hills, Sierra de Naguabo:—Cuba.

21. **Rynchospora bahamensis** Britton, *Torreyia* 13: 217. 1913.

Densely tufted, rootstocks short. Culms nearly filiform, roughish, spreading or reclining, 2–3.5 dm. long; leaves setaceous-flattened, less than 1 mm. wide, roughish-margined, the basal ones about one-fourth as long as the culm, the upper 3–5 cm. long; spikelets oblong, 1.5–2 mm. long in 2 to 4 distant slender-peduncled clusters, each with a single achene; scales dark brown, ovate-oblong, mucronulate; achene elliptic-obovate, faintly transversely wrinkled, 1.5 mm. long; tubercle flattened, conic, one-third to one-half as long as the achene; bristles upwardly barbed, as long as the achene.

Rocky slopes and valleys, western Porto Rico:—Bahamas; Cuba.

22. **Rynchospora Marisculus** Lindl. & Nees; Mart. Fl. Bras. 2: 142. 1842.

Perennial by rootstocks, glabrous. Culm rather slender, 0.5–1 m. long. Leaves 2–5 dm. long, 7 mm. wide or less; corymbs usually several, distant, or the upper ones approximate, dense, the lower slender-stalked, nodding; spikelets numerous, clustered, narrowly ellipsoid, acute, 5–7 mm. long; scales brown, lanceolate or ovate-lanceolate, acute, from 1 to 3 of them subtending achenes; bristles 6 or 7, longer than the achene, scabrous above, pilose at the base; style 2-cleft; achene short-stipitate, narrowly obovate, transversely undulate, 1.5–2 mm. long; tubercle flat-conic, acute, about one-half as long as the achene.

Moist ground, back of Cataño (*Heller 6410*):—Bahamas; Cuba; Hispaniola; Jamaica; continental tropical America.

12. **MARISCUS** (Hall.) Zinn, Cat. Hort. Goett. 79. 1757.

Perennial leafy sedges, similar to some *Rynchosporas*, the spikelets oblong or fusiform, few-flowered, variously clustered. Scales imbricated all around, the lower empty, the middle ones mostly subtending imperfect flowers, the upper usually fertile. Perianth none. Stamens 2 or sometimes 3. Style 2–3-cleft, deciduous from the summit of the achene, its branches sometimes 2–3-parted. Achene ovoid to globose, smooth or longitudinally striate. Tubercle none. [Latin, referring to the marsh habitat of some of the species.] About 40 species, natives of temperate and tropical regions. Type species: *Schoenus Mariscus* L.

1. **Mariscus jamaicensis** (Crantz) Britton, in Britton & Brown, Ill. Fl. ed. 2, 1: 348. 1913.

Cladium jamaicense Crantz, Inst. 1: 362. 1766.

Cladium occidentale Schrad. Fl. Germ 1: 76. 1806.

Culm stout, 1.5–3 m. high, obtusely 3-angled. Leaves very long, glabrous, 6–20 mm. wide, the margins spinulose-serrulate; umbels several or numerous, decoupled, forming a large panicle; spikelets mostly 2–5 together at the ends of the raylets, narrowly ovoid, acute, 4–5 mm. long; uppermost scale subtending a perfect flower; stamens 2; achene ovoid, abruptly sharp-pointed, wrinkled, narrowed to the base, 2 mm. long, brown, shining. [Included by Urban in *Cladium Mariscus* (L.) R. Br. of Europe.]

Coastal marshes, Porto Rico:—southeastern and southern United States; Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe to Grenada; continental tropical America. SAW-GRASS.

13. **MACHAERINA** Vahl, Enum. 2: 238. 1805.

Tall, perennial, smooth and glabrous sedges with xiphioid or subterete leaves, and numerous small spikelets in elongated panicles. Lower scales of the spikelet empty, the upper 1-4 subtending perfect flowers. Stamens 3. Style 3-cleft, its branches elongated, its base pilose. Bristles mostly 6, very slender, smooth. Achene stipitate or subsessile, tipped by the persistent style base. [Greek, referring to the sabre-like leaves of the type species.] Two species, natives of the West Indies, the following typical.

1. **Machaerina restioides** (Sw.) Vahl, Enum. 2: 238. 1806.

Schoenus restioides Sw. Prodr. 19. 1788.

Cladium restioides Benth.; Clarke in Urban, Symb. Ant. 2: 135. 1900.

Culm compressed, rather stout, 1 m. high or less. Leaves xiphioid, equitant, flat, numerous, 5-12 mm. wide, the basal ones often exceeding the culm; panicle narrow, 3-6 dm. long, sometimes much branched, its branches somewhat flexuous, subtended by short leaves; spikelets clustered, 4-5 mm. long, ovoid, bearing 2-4 achenes; scales dark red-brown, ovate; bristles as long as the achene or longer; achene oblong, 1 mm. long, stipitate, brown, narrowed at both ends.

Wet rocky places at high elevations in the Luquillo Mountains:—Cuba; Hispaniola;—Saba and St. Kitts to St. Vincent.

14. **REMIREA** Aubl. Pl. Guian. 1: 44. 1775.

A perennial, densely leafy sedge, the leaves linear-lanceolate, rigid, spinulose-tipped, their sheaths imbricated, the 1-flowered spikelets in short dense terminal spikes, their lower scales empty. Flower perfect; bristles none; stamens 3; style 3-cleft, linear, continuous with the ovary. Achene smooth, sessile. [Guiana name]. A monotypic genus of tropical and subtropical sand-dunes and beaches.

1. **Remirea maritima** Aubl. Pl. Guian. 1: 45. 1775.

Rootstocks slender, elongated; culms solitary or clustered, erect, ascending or nearly prostrate, 2-30 cm. long, leafy to the top. Leaves flat, 2-8 cm. long, 2-7 mm. wide; spikes solitary or digitate, 1-2 cm. long, subtended by bracts similar to the upper leaves; spikelets many, brownish, 3-5 mm. long; achene somewhat shorter than the upper scale.

Coastal sands, Arecibo, Loiza:—Florida; Hispaniola; Trinidad; continental tropical South America and Old World tropics. BEACH SEDGE.

15. **LAGENOCARPUS** Nees, Linnaea 9: 304. 1834.

Large, perennial sedges, with long terminal panicles of imperfect flowers, the upper part of the panicles with pistillate, the lower with staminate. Pistillate spikelets 1-flowered, the staminate several-flowered. Bristles none. Pistillate flower with 3 linear style-branches, subtended by 3 scales. Achene terete, smooth, fused with its conic beak. [Greek, flask-fruit, from the shape of the achene.] About 15 species, natives of tropical America. Type species: *Lagenocarpus guianensis* Nees.

1. **Lagenocarpus portoricensis** Britton, Bull. Torrey Club 50: 55. 1923.

Culm stout, erect, trigonous, glabrous, about 8 dm. high. Leaves 8-12 mm. wide, nearly as long as the culm, smooth, long-attenuate, with numerous transverse veinlets; panicle narrow, puberulent, about 3 dm. long and 5 cm. thick, the

lower half of staminate spikelets, on nearly erect branches, the upper half of pistillate; bractlets aristate; staminate spikelets about 4 mm. long, short-stalked; scales subtending the achene obovate, subtruncate, ciliate, mucronate; achene, with its beak, ovoid, 3 mm. long, brown with three darker blotches, the beak about as long as the body. [Recorded by C. B. Clarke and by Urban as *L. tremulus* Nees.]

Wet sandy situations between Manati and Vega Baja (*Underwood & Griggs 946, type*); collected also by Sintensis near Dorado. Endemic.

16. **SCLERIA** Berg., Vet. Acad. Handl. 26: 142. 1765.

Leafy sedges, mostly perennial, the spikelets small, clustered in terminal, or terminal and axillary fascicles, or sometimes interruptedly spicate. Flowers monoecious. Fertile spikelets 1-flowered. Staminate spikelets many-flowered. Scales imbricated, the 1-3 lower and sometimes also the upper ones of the fertile spikelets empty. Perianth none. Style 3-lobed, slender or sometimes swollen at the base, deciduous. Ovary supported on a disk (hypogynium), or this wanting. Stamens 1-3. Achene globose or ovoid, obtuse, crustaceous or bony, white in most species. [Greek, in allusion to the hard fruit.] About 100 species, natives of tropical and temperate regions, known as NUT-RUSH. Type species: *Scleria Flagellum-nigrorum* Berg.

A. HYPOGYNIUM PRESENT

- a. Margin of the hypogynium neither ciliate nor fimbriate.
 *Roots fibrous or rootstocks short; culms slender.
 Achene ridged-reticulated, pilose
 Achene faintly reticulated, 3-banded. 1. *S. setacea*.
 **Perennials, with long or stout rootstocks.
 Culms spreading or climbing, branched. 3. *S. secans*.
 Culms erect, simple. 4. *S. pterota*.
 Plants relatively slender, not very rough.
 Panicle stout, very rough. 5. *S. canescens*.
 Panicle elongated. 6. *S. scindens*.
 Panicle short, dense.
- b. Margin of the hypogynium ciliate or ciliate.
 Achene 1-1.5 mm. long. 7. *S. microcarpa*.
 Achene 2-3 mm. long. 8. *S. mitis*.
 Style-base black, persistent.
 Style-base pale, at length deciduous. 9. *S. cubensis*.
 Hypogynium margin puberulent or finely ciliate. 10. *S. Grisebachii*.
 Hypogynium margin densely long-ciliate.

B. HYPOGYNIUM NONE

- a. Achene smooth.
 Annual, with fibrous roots. 11. *S. distans*.
 Perennials, with rootstocks.
 Inflorescence interruptedly spicate, ciliate. 12. *S. hirtella*.
 Inflorescence of several loose panicles, glabrous. 13. *S. lithosperma*.
 b. Achene verrucose; inflorescence glomerate-spicate. 14. *S. doradoensis*.

1. **Scleria setacea** Poir. in Lam. Encycl. 7: 4. 1806.

Scleria micrantha Poir. in Lam. Encycl. Suppl. 5: 108. 1817.

Scleria hemilaphra Steud. Syn. Pl. Cyp. 169. 1855.

Scleria Torrejiana Walp. Ann. 3: 696. 1852.

Scleria reticularis pubescens Britton, Ann. N. Y. Acad. Sci. 3: 232. 1885.

Fibrous rooted, or with short rootstock, annual or perennial; culms tufted, slender, smooth, 8 dm. long or less. Leaves 1.5-5 mm. wide; panicles axillary, stalked, 3-6 cm. long; spikelets several to numerous; achene irregularly ridged-reticulated, white, subglobose to ellipsoid, 1.5-2 mm. long, its ridges minutely pilose; hypogynium-lobes triangular-ovate, smooth.

Grassy places near Hato Grande and Lares:—southeastern United States; Cuba; continental tropical America. Porto Rico is the type locality of the species.

2. ***Scleria Stevensiana*** Britton, Bull. Torrey Club 50: 55. 1923.

Perennial? rootstocks short or none; culms very slender, tufted, slightly scabrous above, weak, 4-5 dm. long. Leaves soft, scabrous-margined, 4 mm. wide or less; panicles 2 or 3, axillary, the lower stalked, the upper one nearly sessile, about 3 cm. long; bracts narrowly linear-subulate, 2.5 cm. long or less; spikelets several or numerous; achene depressed-globose, about 1.5 mm. in diameter, apiculate, glabrous, shining, faintly reticulated, nearly white, with 3 vertical brown bands; hypogynium lobes lanceolate, acuminate, glabrous.

Lares (*Stevens & Hess, 4944*). Endemic.

3. ***Scleria secans*** (L.) Urban, Sumb. Ant. 2: 169. 1900.

Schoenus secans L. Syst. ed. 10, 865. 1759.

Scleria reflexa H.B.K. Nov. Gen. 1: 232. 1816.

Perennial by rootstocks; culms roughish-puberulent, spreading or high-climbing, 3-6 m. long. Leaves roughish, 2 dm. long or less, 3-5 mm. wide, the ligule scarious-appendaged; panicles 2-3, axillary to the upper leaves, slender-stalked, loosely branched, 3-8 cm. long, the rachis villous; achene smooth, white, shining, ellipsoid, 3-4 mm. long; hypogynium flat, orbicular.

Wet or moist mountain woodlands, Porto Rico:—Jamaica; Cuba; Hispaniola; Montserrat to Trinidad; continental tropical America. This is, perhaps, the species recorded by Krebs as found in St. Thomas prior to 1851, under the name *Scleria jagatum*.

4. ***Scleria pterota*** Presl, in Oken Isis 21: 268. 1828.

Scleria communis Kunth, Enum. 2: 340. 1837.

Scleria pratensis Nees in Mart. Fl. Bras. 2: 179. 1842.

Perennial by stout rootstocks; culms slightly rough, rather slender, 1 m. high or less. Leaves 6-12 mm. wide, 1.5-3 dm. long, the sheath somewhat 3-winged, the ligule about 4 mm. long; panicles 2-4, narrow, 5-15 cm. long, greenish-brown or purplish; achene globose, white, smooth, about 2 mm. in diameter; hypogynium 3-lobed. [*S. mitis* of Bello, not of Berg.]

Moist shaded situations at lower and middle elevations, Porto Rico; St. Thomas; St. Croix; St. Jan; Tortola:—Jamaica; Cuba to Barbados; continental tropical America.

5. ***Scleria canescens*** Boeckl. Cyp. Nov. 1: 37. 1888.

Perennial by rootstocks; culms stout, erect or ascending, 1 m. long or less, roughish. Leaves 6-10 mm. wide, elongated, very rough-margined, the sheaths wingless, pilose above, the ligule short-triangular; panicles 2-4, stalked, dense, 5-18 cm. long, brown-purple; achene ellipsoid to subglobose, 3-1 mm. long, smooth, white; hypogynium 3-lobed, the lobes reflexed.

In wet woodlands at middle and higher elevations, Porto Rico. Endemic.

6. ***Scleria scindens*** Nees, Linnaea 9: 303. 1834.

Scleria scaberrima Boeckl. Cyp. Nov. 2: 41. 1890.

Perennial, elongated and vine-like, the culms trigonous, scabrous, 1-3.5 m. long, often forming large colonies. Leaves 8 dm. long or less, flat, 6-11 mm. wide, their margins scabrous-ciliate, their sheaths margined or narrowly winged, the ligule short, rounded; panicle dense, short, terminal, 5-10 cm. long, its branches and branchlets puberulent, occasionally accompanied by 1 or 2 much smaller ones in the upper axils; spikelets short-stalked or sessile; achene globose, white, smooth, 2-2.5 mm. in diameter; hypogynium 3-lobed, the lobes rounded, reflexed.

Mountain forests, St. Thomas; Tortola; Virgin Gorda:—Cuba; St. Kitts; Guadeloupe; Dominica; Martinique; St. Lucia; St. Vincent.

7. *Scleria microcarpa* Nees, *Linnaea* 9: 302. 1834.

Scleria foliosa C. Wright; *Sauvaille*, *Anales Acad. Habana* 8: 154. 1871.
Not A. Rich. 1851.

Scleria microcarpa foliosa Clarke in Urban, *Symb. Ant.* 2: 149. 1900.

Perennial by rather stout rootstocks; culms slender, smooth, erect, 1 m. high or less. Leaves 6–12 mm. wide, 1–3 dm. long, smooth, the ligule 4–8 mm. long, the sheaths narrowly 3-winged; panicles usually several, very narrow, erect, stalked or the upper sessile, loosely flowered, 4–12 cm. long; spikelets sessile, often 2 or 3 together; achene ellipsoid, white, smooth, 1–1.5 mm. long; hypogynium-margin ciliate or ciliolate.

In wet grounds at lower and middle elevations, Porto Rico, ascending into the Luquillo Mountains:—Jamaica; Cuba; Trinidad; continental tropical America.

8. *Scleria mitis* Berg. *Vet. Akad. Handl.* 26: 145. 1765.

Perennial by rootstocks, sometimes forming colonies; culms stout, smooth, 1–2.5 m. long, trigonous. Leaves flat, 6 dm. long or less, 1–2.5 cm. wide, the sheaths 3-winged; panicle 2–6 dm. long, its branches glabrous or pilose, ascending or nearly erect; spikelets many, 2–3 mm. long, the pistillate sessile, some of the staminate stalked; achene ellipsoid, about 3 mm. long, smooth, white and lustrous when mature, the small conic black tubercle persistent; hypogynium truncate, fringed with brown or red-brown hairs.

Wet grounds, Porto Rico, near Bayamon and in the eastern mountains:—Cuba; Guadeloupe; Martinique; St. Vincent; Trinidad; continental tropical America.

9. *Scleria cubensis* Boeckl. *Cyp. Nov.* 2: 42. 1890.

Scleria microcarpa subciliata Clarke in Urban, *Symb. Ant.* 2: 149. 1900.

Perennial by rootstocks; culms rather stout, erect, 1 m. high or less, smooth. Leaves 1–2 cm. wide, nearly or quite smooth, often 3 dm. long or more; panicles 3 or 4, with erect branches, the terminal one 1–3 dm. long; spikelets sessile, somewhat clustered; achene ovoid to ellipsoid, smooth, white, or yellowish, about 3 mm. long; hypogynium-margin entire, puberulent, not ciliate.

Marshes, wooded banks and thickets, Porto Rico, ascending to the higher elevations:—Jamaica; Cuba; Hispaniola.

10. *Scleria Grisebachii* Clarke in Urban, *Symb. Ant.* 2: 150. 1900.

Scleria microcarpa latifolia Boeckl. *Linnaea* 38: 517. 1874.

Perennial by rootstocks; culms stout, erect, nearly smooth, 8–12 dm. high. Leaves elongated, smooth, 8–20 mm. wide, their sheaths narrowly winged, the ligule 6–10 mm. long; panicles 3–5, narrow, the terminal one 2–3 dm. long, the branches ascending; spikelets sessile, clustered; achene subglobose, smooth, white, about 2.5 mm. in diameter; margin of the hypogynium densely brown-ciliate.

Forests at higher elevations, Porto Rico, collected by Sintenis:—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Dominica; Martinique.

11. *Scleria distans* Poir. in *Lam. Encycl.* 7: 4. 1806.

Annual, with fibrous roots; culms very slender, smooth, erect, 4 dm. high or less. Leaves smooth, grass-like, 1.5–3 mm. wide; inflorescence interruptedly spicate, of 4–7 sessile, nearly erect fascicles; bracts long-ciliate, not exceeding the spikelets; achene globose with a trigonous stipe-like base, white, smooth, shining, about 1 mm. in diameter, 9-porose beneath just above the base; hypogynium none.

Moist soil at lower and middle altitudes, Porto Rico; St. Thomas (according to Clarke):—Cuba; Hispaniola; Guadeloupe.

12. *Scleria hirtella* Sw. Prodr. 19: 1788.

Perennial by rather stout horizontal rootstocks; culms slender, glabrous, 2-7 dm. long. Leaves grass-like, often pubescent, at least on the sheaths, 1.5-4 mm. wide; inflorescence interruptedly spicate, of 5-9 sessile, long-ciliate and hispid, nodding fascicles; achene globose, white, shining, smooth, about 1 mm. in diameter, 9-12 porose underneath above the trigonous base; hypogynium none.

Sandy soil and grassy places at lower and middle elevations, Porto Rico:—southeastern United States; Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America; tropical Africa. The record of this from St. Thomas by Krebs may apply to the preceding species.

13. *Scleria lithosperma* (L.) Sw. Prodr. 18. 1788.

Scirpus lithospermus L. Sp. Pl. 51. 1753.

Scleria filiformis Sw. Prodr. 19. 1788.

Scleria Krugiana Boeckl. Cyp. Nov. 1: 35. 1888.

Perennial by rather short rootstocks, the culms often clustered, slender, weak, glabrous, 2-6 dm. long. Leaves 0.5-3 mm. wide, the upper elongated, the lowest reduced to pubescent or puberulent sheaths; panicles 1-3, distant, glabrous, small, stalked or the upper sessile; bracts filiform, glabrous; achene obovoid-ellipsoid, white, smooth, shining, about 2 mm. long, its base trigonous.

Woods and shaded hillsides, Porto Rico, especially on limestones, at lower elevations; Muertos; Mona; Vieques; St. Thomas; St. Croix; Virgin Gorda:—Florida; West Indies; continental tropical America and Old World tropics.

14. *Scleria doradoensis* Britton, Bull. Torrey Club 50: 55. 1923.

Perennial? Culms slender, rather stiff, glabrous, erect, tufted, 3-4 dm. high. Leaves glabrous, scabrate, shorter than the culm, about 2 mm. wide, the apex attenuate; inflorescence terminal, glomerate-spicate, 5-7 cm. long; glomerules 6-8, few-flowered, not nodding; bracts about 3 mm. long, brown-ciliate; achene white, subglobose-obovoid, very obtusely trigonous, verrucose-tuberculate, 1.5 mm. long, 12-porose underneath just above the trigonous base; hypogynium none.

White sand near Dorado (Britton, Britton and Brown 7064). Endemic.

Scleria latifolia Sw. recorded by Krebs as formerly found in St. Thomas, is not known to occur north of St. Kitt's.

17. **CAREX** [Dill.] L. Sp. Pl. 972. 1753.

Grass-like sedges, perennial by rootstocks. Culms mostly 3-angled. Leaves 3-ranked, the upper elongated or very short (bracts) and subtending the spikes of flowers, or wanting. Flowers monoecious or dioecious, solitary in the axils of bracts (scales). Spikes either wholly pistillate, wholly staminate, or bearing both staminate and pistillate flowers (androgynous). Perianth none. Staminate flowers of 3 stamens, the filaments filiform. Pistillate flowers of a single pistil with a style and 2 or 3 stigmas, borne on a very short axis in the axil of a sac-like bractlet or second bract called the perigynium (utricle), which completely encloses the achene. Achene 3-angled, lenticular or plano-convex. A vast genus, of more than 1000 species, widely distributed, most abundant in the temperate zones, known as **SEDE**. Type species: *Carex pulicaris* L.

1. *Carex polystachya* Sw.; Wahlenb. Vet.-Akad. Nya Handl. 24: 149. 1803

Carex cladostachya Wahlenb. Vet.-Akad. Nya Handl. 24: 149. 1803.

Rootstocks short; culms clustered, slender, glabrous, 3-8 dm. long; leaves glabrous, equalling the culm or shorter, roughish-margined, 3-6 mm. wide; panicle narrow, elongated, the lower clusters of spikes filiform-stalked; spikes

usually numerous, 7–11 mm. long, greenish-brown, oblong, mostly staminate at apex and pistillate below; scales ovate, the lower awned; perigynium ellipsoid, 3–4 mm. long, glabrous, striate-beaked; style 3-cleft.

Mountain woodlands at high altitudes, Porto Rico:—Jamaica; Cuba; Hispaniola; St. Kitts; Martinique; Mexico to Colombia and Bolivia.

Isolepis pallidiflora DC, recorded by Krebs from St. Thomas, is an unpublished species, not otherwise known.

Order 6. ARECALES.

Mostly trees with unbranched, erect trunks and a terminal bud, the large leaves pinnately or palmately divided, forming a crown, the small perfect or imperfect flowers usually paniced, sessile or pedicelled, the panicle subtended by spathes and usually bracted. Sepals and petals each 3, distinct or connate. Stamens commonly 6, sometimes 9–12; filaments distinct or connate below; anthers introrse; pistillate flowers sometimes with staminodia. Ovary various, 1-celled, 3-celled, or of 3 distinct carpels; style usually short or wanting; ovules 1 in each carpel, anatropous. Fruit drupaceous, 1-seeded. Seed with horny or cartilaginous endosperm, the embryo near the surface.

Family 1. ARECACEAE Rehb.

PALM FAMILY

Characters of the order. About 150 genera and 1200 species, mostly tropical.

A. Leaves pinnate.

1. Endocarp membranous, fibrous or woody, without pores.

Petals or corolla-lobes of the pistillate flowers valvate.

Flowers in 3's, the middle one pistillate, at least on the lower branchlets of the inflorescence.

Flowers superimposed in 2's–5's, the lowest usually pistillate.

Petals of the pistillate flowers imbricated.

Filaments of the staminate flowers distinct.

Filaments of the staminate flowers united below, radiating above.

2. Endocarp bony, with 3 pores.

Pores at about the middle of the fruit; spiny palms.

Flowers in 3's, the middle one pistillate, at least on the lower branchlets of the inflorescence, its corolla gamopetalous.

Pistillate flowers on the lower parts of the branchlets of the inflorescence, their petals imbricate.

Pores near the apex of the large fruit; unarmed palms.

B. Leaves palmate or flabellate.

Ovary 3-carpellary; leaves flabellate.

Ovary monocarpellary; leaves palmate.

Seed not grooved.

Seed grooved and fissured.

1. *Roystonea*.

2. *Gaussia*.

3. *Euterpe*.

4. *Calyptrogyne*.

5. *Bactris*.

6. *Acrocomia*.

7. *Cocos*.

8. *Sabal*.

9. *Thrinax*.

10. *Coccothrinax*.

1. ROYSTONEA Cook, Science II 12: 479. 1900.

Tall, unarmed palms, with large, regularly pinnate leaves, stout, solitary, nearly cylindrical trunks, and monoecious flowers in drooping panicles subtended by two spathes, the lower spathe very large. Flowers in 3's, the middle one pistillate, at least on the lower branches of the panicle. Staminate flowers with small ovate sepals, ovate valvate petals, usually 6 stamens and a rudimentary ovary. Pistillate flowers with broad imbricated entire sepals, an urceolate corolla with valvate segments, 6 staminodes united into a cup and a globose, 1–3-celled ovary. Fruit subglobose or oblong, the pericarp thin, somewhat fleshy, the endocarp woody without pores. [In honor of General Roy Stone,

United States engineer, beloved by Porto Ricans.] Four known species of the West Indies. Type species: *Oreodoxa regia* H.B.K.

Fruit yellowish brown, about 13 mm. long, nearly 10 mm. thick; trunk relatively low. 1. *R. borinquena*.
Fruit purplish, about 10 mm. long, 8-9 mm. thick; trunk relatively tall. 2. *R. regia*.

1. **Roystonea borinquena** Cook, Bull. Torr. Club. 28: 552. 1901.

Oreodoxa caribaea Dammer & Urban in Urban, Symb. Ant. 4: 129. 1903.

Roystonea caribaea P. Wilson, Bull. N. Y. Bot. Gard. 8: 385. 1917.

Trunk stout, fusiform-cylindric, up to 18 m. high, 5-6 dm. in diameter, annulate by the leaf-scars, becoming smooth. Leaves 2-3 m. long, the petiole stout and short, the segments numerous, linear, acuminate, 5-8 dm. long, 2-4.5 cm. wide, the base narrowed; panicle twice branched, much shorter than the leaves; lower spathe nearly as long as the panicle; flowers about 5 mm. long; fruit oval, yellowish brown, about 13 mm. long and 10 mm. thick. [*Oreodoxa regia* of Bello, not H.B.K.; the name *Euterpe caribaea* Spreng. is based on *Areca oleracea* Jacq. This is the plant recorded as of undetermined genus in Urban, Symb. Ant. 4: 131. *Areca oleracea* of West.]

Hillsides and forests, Porto Rico, in moist or wet districts and in valleys of the southern districts; Vieques; St. Croix. Endemic. ROYAL PALM. PALMA REAL. PALMA DE YAGUAS. The leaves are used for thatching houses and barns nearly throughout Porto Rico, and their broad bases for the sides of huts and other structures. It is much planted for ornament. The fruit is eaten by pigs. Sometimes called CABBAGE PALM.

2. **Roystonea regia** (H.B.K.) Cook, Science II. 12: 479. 1900.

Oreodoxa regia H.B.K. Nov. Gen. 1: 305. 1816.

Trunk up to 25 m. tall, 5-6 dm. in diameter, nearly cylindric or slightly fusiform. Leaves and inflorescence similar to those of the preceding species; fruit short-oblong, purplish, about 10 mm. long and 9 mm. thick. [*Oreodoxa oleracea* of Kuntzo.]

Valleys, St. Thomas; St. Jan (ex Eggers); St. Croix (ex Beccari); probably planted or spontaneous after planting on all three islands; occasionally planted for ornament in Porto Rico; a fine group about 20 years old was seen at the Agricultural Experiment Station, Mayaguez, in 1923. Florida; Cuba; Hispaniola. CUBAN ROYAL PALM.

2. **GAUSSIA** Wendl. Goett. Nachr. 1865: 327. 1865.

Unarmed palms, with tall, flexible, tapering, slender trunks enlarged at the base, coarse woody rock-clasping roots, few, pinnate leaves with narrow segments, and small, monoecious panicle flowers, the panicles stalked, drooping. Flowers superimposed in 2's-5's, the lowest usually pistillate. Staminate flowers obovoid, the sepals distinct, imbricated; petals much longer than the sepals, concave, spreading; stamens 6 with distinct filaments; rudimentary ovary conic. Pistillate flowers rather smaller than the staminate; sepals small, broad; petals longer than the sepals, valvate, staminodes minute; ovary trigonous. Fruit obovoid-oblong, the epicarp fleshy, the endocarp membranous, the seed rounded above, narrowed to the base. [In honor of Gauss, a German scientist.] Two known species, the following and *G. princeps* Wendl, the generic type, of western Cuba.

1. **Gaussia attenuata** (Cook) Beccari, Pomona Coll. Journ. Econ. Bot. 2: 275. 1912.

Aeria attenuata Cook, Bull. Torr. Club 28: 548. 1901.

Gaussia portoricensis Wendl. in Kerch. Palm, 245, hyponym. 1878.

Trunk up to 25 m. high, or perhaps higher, the basal enlargement up to 2.5 dm. in diameter, tapering upward and 7-10 cm. in diameter at the summit. Leaves usually 4-6, about 1 m. long, the petiole 2-3 dm. long; rachis angled;

segments many, close together, the longer ones 3-4 dm. long, about 3 cm. wide, the upper ones much smaller and narrower, all acute or acuminate; panicles shorter than the leaves, the numerous slender simple or forked branches 2.5 dm. long or less; flowers sessile; corolla orange-yellow, about 3 mm. long; fruit broadly obovoid, orange-red, nearly 1 cm. in diameter. The large roots bear long distant spinulate projections.

Rocky limestone hills and ridges in moist and dry districts, Porto Rico, abundant on crags of the Arecibo limestone and in limestone crags near Ponce, Juana Diaz, and Villalba and observed near Cabo Rojo and San German. Endemic. LLUME.

3. **EUTERPE** Gaertn. Fr. & Sem. 1: 24. 1788.

Unarmed palms, with tall, nearly cylindrical trunks, pinnate leaves with narrow segments, the inflorescence with elongated slender, mostly simple branches the spathes 2, the outer one short, the inner elongated, the small white flowers sessile, monoecious, solitary or 2 or 3 together, when 3, the middle one pistillate. Staminate flowers with broad imbricated sepals, oblong valvate petals, 6 distinct stamens and a rudimentary ovary. Pistillate flowers with imbricated obtuse sepals, imbricated suborbicular petals and an oblong ovary; staminodes none. Fruit globose, small, the epicarp thin, smooth, slightly fleshy, the endocarp fibrous-reticulated. Seed globose, the endosperm ruminated. [Greek, pleasing.] Perhaps 10 species of tropical America, the following typical.

1. **Euterpe globosa** Gaertn. Fr. & Sem. 1: 24. 1788.

Acrista monticola Cook, Bull. Torr. Club 28: 557. 1901.

Trunk nearly cylindrical, up to 15 m. high, about 1.5 dm. in diameter, ridged by the leaf-scars. Leaves several, about 2 m. long or longer, the segments numerous, linear-lanceolate, long-acuminate, the longer ones 5-9 dm. long, 3-5 cm. wide; inflorescence up to 1 m. long; flowers numerous on the elongated branches, the sepals striate, the white petals about 5 mm. long; fruit about 12 mm. in diameter, black, shining; pericarp 1 mm. thick, the fibres of the endocarp few; perianth more or less persistent after the fruits have fallen, cupulate; seed brown and hard. [*Orcodoxa oleracea* of Bello, not of Martius.]

Mountain forests at middle and higher elevations, Porto Rico, descending to about 600 m.:—Cuba; Hispaniola; Saba to Grenada. PALMA DE SIERRA. MOUNTAIN PALM. Its leaves are used for thatching in the mountains, its fruits are eaten by wild doves.

4. **CALYPTROGYNE** Wendl. Bot. Zeit. 17: 72. 1859.

Unarmed tall erect palms, with large, pinnate leaves; the monoecious small flowers in drooping, peduncled panicles subtended by 2 narrow spathes, borne in depressions of the panicle-branches, solitary or 3-together. Staminate flowers with 3, distinct, narrow, scarious sepals, a deeply 3-lobed corolla with valvate segments, 6 stamens with partially united filaments and a rudimentary ovary. Pistillate flowers with 3 lanceolate, scarious, imbricated sepals, 3 petals imbricated at least at the base and a 3-angled ovary. Fruit oval or obovoid, the epicarp fleshy fibrous, the endocarp thin, fibrous. [Greek, hooded pistil (?).] A few species of tropical America. Type species: *Calyptrogyne spicigera* (Koch) Wendl.

1. **Calyptrogyne occidentalis** (Sw.) Maza, Noc. Bot. Sist. 50. 1893.

Elais (?) *occidentalis* Sw. Fl. Ind. Occ. 619. 1797.

Geonoma Swartzii Griseb. Cal. Pl. Cub. 222. 1866.

Cocops rivalis Cook, Bull. Torr. Club 28: 568. 1901.

Trunk rather stout, 5-10 m. high, bearing annular leaf-scars. Leaves 3-6 m. long, the sheaths short, broad, the short petioles stout, the rachis stout, gla-

brous, 2-edged, the very numerous segments linear, long-acuminate, 5–8-costate, glabrous, the larger middle ones up to 8 dm. long and 6 cm. wide, those of young leaves much smaller; inflorescence pendulous, 3–5 dm. long, glabrous, twice branched, the flower-bearing branches cylindrical, 1.5–2.5 cm. long, about 5 mm. thick, alveolate; flowers ternate at the alveoles, 4–6 mm. long; fruit oval, 8–12 mm. long, smooth, rounded at both ends, the epicarp thin; seed nearly orbicular.

Banks of streams, vicinity of San Sebastian, Porto Rico:—Jamaica; Cuba; Hispaniola.

5. **BACTRIS** Jacq. Sel. Stirp. Am. 279. 1763.

Erect prickly palms, with regularly or irregularly pinnatisect leaves, the small monoecious flowers in dropping panicles subtended by 2 prickly spathes. Staminate flowers with an annular or 3-parted calyx, 3 ovate or lanceolate valvate petals and 6–12 stamens, the ovary none or rudimentary. Pistillate flowers borne on the lower parts of the panicle-branches, the calyx various, the gamopetalous corolla urceolate or cylindrical, 3-toothed, the ovary 3-celled. Fruit drupaceous, 1-celled, the endocarp bony, 3-porose at or above the middle. [Greek, a staff.] A large genus, the species, perhaps, as many as 100, natives of tropical America. Type species: *Bactris minor* Jacq.

1. **Bactris acanthophylla** Mart. Palm. Orbig. 70. 1847.

Curima calophylla Cook, Bull. Torr. Club 28: 561. 1901.

Trunk slender, up to 18 m high and 2 dm. in diameter, armed with stiff, nearly black prickles 4–7 cm. long or becoming spineless. Leaves up to 2.5 m. long, pinnatisect into many, thin, nearly linear segments below, the terminal segment large, pinnately veined, deeply notched, irregularly short-lacinate, the linear lower segments 3–6 cm. wide, obliquely subtruncate-lacinate; petiole, rachis and segments armed with nearly black prickles or mature leaves spineless; inner spathe up to 1 m. long, densely prickly; peduncle densely prickly; inflorescence 6 dm. long or longer; flowers greenish-white, about 3 mm. long; fruit globose, red, about 1.5 cm. in diameter.

Forests, and woodlands in wet or moist districts at lower and middle elevations, Porto Rico. Endemic. PALMA DE COYOR. COYURE.

Bactris Pavoniana Mart. is credited to Porto Rico by Martins (Palm, Orbig. 70). We have been unable to find more than one species on the island. Both it and *B. acanthophylla* were described from leaf-specimens only, collected in Porto Rico and, presumably, represent only one species.

6. **ACROCOMIA** Mart. Hist. Nat. Palm. 2: 66. 1823.

Erect tall prickly palms, with stout, cylindrical or fusiform trunks, regularly pinnatisect leaves with numerous, narrow segments, and monoecious flowers in drooping panicles subtended by 2 hairy or prickly spathes. Staminate flowers numerous, densely spicate on the panicle-branches, with 3 small ovate sepals, a 3-lobed corolla with valvate segments, 6 stamens with filiform filaments, a rudimentary ovary present or wanting. Pistillate flowers few, large, borne on the lower part of the panicle-branches, the 3 small sepals imbricated, the 3 petals much larger, imbricated, the ovary 3-celled. Fruit subglobose, the exocarp thin, mucilaginous, the bony endocarp with 3 pores near the middle. Seed with white, oily endosperm. [Greek, referring to the armament.] About 15 species, natives of tropical America, the following typical.

1. **Acrocomia aculeata** (Jacq.) Lodd.; Mart. Hist. Nat. Palm, 3: 286. 1845.*Cocos aculeatus* Jacq. Sel. Amer. 278. 1763.*Acrocomia media* Cook. Bull. Torr. Club 28: 566. 1901.

Trunk cylindrical or somewhat fusiform, up to about 15 m. high, 2-3 dm. thick, armed, often to the base, with rings of long black acicular prickles, or these at length deciduous. Leaves 3-4 m. long, the segments linear, shining above, acuminate, the larger ones 6-7 dm. long, 6-20 mm. wide; the rachis prickly; inner spathe densely pubescent and somewhat prickly, up to 6 dm. long; panicles 1.5 m. long or less, the peduncle prickly, the parts bearing staminate flowers 1-2 dm. long, the pistillate flowers only 2-5, distant; staminate flowers about 8 mm. long, the stamens borne at the top of the corolla-tube; pistillate flowers subglobose, about 10 mm. long, their petals suborbicular; fruit depressed-globose, about 4.5 cm. in diameter, smooth, yellowish, the seed edible. [*Acrocomia sclerocarpa* of Bello, not of Martius; *A. fusiformis* of Krebs.]

Plains and hillsides at lower and middle elevations, Porto Rico, in moist and dry districts, rare or absent in the wet eastern parts of the island; St. Thomas;—Jamaica; Hispaniola; St. Kitts; Antigua; Guadeloupe; Dominica; Martinique; Grenada; Trinidad. Its wood is cut into walking-sticks. COCOZO. GRUGRU.

7. **COCOS** L. Sp. Pl. 1188. 1753.

Unarmed palms, with pinnate leaves, their numerous segments narrow, their petioles concave above, the monoecious, bracted flowers mostly densely clustered among the petioles, the staminate uppermost in the clusters, smaller than the pistillate. Staminate flowers with 3 small valvate sepals, 3 oblong valvate petals, and 6 stamens with subulate filaments, the anthers linear. Pistillate flowers ovoid, the 3 thick sepals imbricated, the 3 coriaceous petals valvate, the ovary 3-celled, with 2 of the cells usually empty, the ovule ascending. Fruit 1-seeded, often large, the pericarp fibrous, the bony endocarp 3-porose near the base. Seed with a hollow or solid endosperm, the embryo opposite one of the pores of the endocarp. [The coco-nut.] Perhaps 30 species, of tropical America and subtropical South America, the following typical one widely distributed also in the Old World tropics, its original home unknown.

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

Trunk up to 30 m. high, usually 10-20 m. Leaves 3-6 m. long, somewhat drooping, short-petioled, the numerous linear-lanceolate, acuminate segments shining above, 5-7 dm. long, about 5 cm. wide; staminate flowers 10-12 mm. long; pistillate flowers about 2.5 cm. long; fruit ovoid or ellipsoid, bluntly 3-angled, 2-3 dm. long, the fibrous husk 2-4 cm. thick, the bony endocarp 3-5 mm. thick, the hollow endosperm about 1 cm. thick, filled with a clear saccharine liquid, which ultimately disappears.

Locally spontaneous after cultivation, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola.—All tropical insular and coastal regions. The tree is unknown anywhere in a wild state, but presumably is of American origin. Its fruits are one of the most important products of Porto Rico; the wood is used for posts and piles and cut into walking sticks.

Besides planting for its fruit the tree is highly ornamental and the suburbs of San Juan in particular have many houses surrounded by the Coco-nut. A striking example of its use may be seen at Ensedada, in a very dry climate, where on an unpromising rocky point on Guanica Harbor many young trees were planted a few years ago, and by irrigation soon formed a beautiful grove, the shade of which has made the charming garden of Mrs. F. T. Maxwell possible. COCO-NUT. PALMA DE COCO.

Cocos plumosa Hook., Brazilian, occasionally planted for ornament in Porto Rico, has rather flaccid leaves up to 5 m. in length, somewhat recurved, the narrowly linear, numerous segments 2-4 together along the rachis.

8. **SABAL** Adans.; Guersent, Bull. Soc. Philom. 3: 206. 1803.

Unarmed palms, the stems erect, creeping or subterranean, the leaves palmately cleft, with a long petiole and a short rachis, the narrow segments bearing marginal fibres, 1-cleft or 2-cleft, the petiole concave above. Panicles spreading or drooping. Flowers small, perfect, white or greenish. Sepals 3, unequal. Petals 3, imbricated. Stamens 6; filaments subulate or lanceolate, united at the base. Ovary 3-celled; style 3-angled; stigma truncate. Drupes solitary, with a thin epicarp and a fleshy pericarp. Seed depressed-globose, hard, the endosperm bony. [Name not explained.] About 18 species, of the southern United States; Bermuda, West Indies, Mexico, and northern South America. Type species: *Sabal Adansonii* Guersent.

1. **Sabal causiarum** (Cook) Beccari, Webbia 2: 71. 1907.

Inodes causiarum Cook, Bull. Torr. Club 28: 531. 1901.

Inodes glauca Dammer in Urban, Symb. 4: 127. 1903.

Trunk up to about 16 m. high, usually lower, gray, up to 4 dm. in diameter. Petiole stout, 3-4 cm. wide, about as long as the blade; blade 2-3 m. in diameter, deeply cleft into long-attenuate segments 4-6 cm. wide, rather rigid, pale and glaucous beneath, light green above, the marginal fibres few, filiform; panicle much branched, as long as the petioles or longer, the numerous spathes 2-4 cm. long, the branchlets slender, spreading; flowers white, sessile, 3-4 mm. long; calyx 3-4-dentate; fruit globose, brown, smooth, about 1 cm. in diameter; seed brown. [*Sabal umbraculifera* of Bello, not of Martius.]

Valleys, hillsides and coastal plains, Porto Rico, most abundant in the southwestern districts. Endemic. PALMA DE SOMBRERO, YARAY. The leaves furnish the material for the very important hat industry and for making, baskets, mats and hammocks, and the palm has been planted locally.

Sabal Blackburnianum Glazebrook, BERMUDA PALMETTO, BULL TEYER, endemic in Bermuda, has been quite commonly planted on St. Croix and St. Thomas where its leaves are used for making hats and in basketry and where it may, perhaps, sometimes be spontaneous from seed. It has a stout trunk often sheathed nearly or quite to the base by the persistent petiole-bases; its green leaves are about 2 m. broad, not at all glaucous; its panicles of flowers are as long as the petioles or shorter; the globose-obovoid fruit becomes about 1.5 cm. in diameter when mature and nearly black. This is perhaps, the palm recorded by Krebs as *Corypha umbraculifera*.

A species of *Sabal* inhabits the sandy plain, West End, Anegada; neither flowers nor fruit have been obtained and the species remains undetermined. It has the appearance there of being indigenous.

9. **THRINAX** Sw. Prodr. 57. 1788.

Unarmed, mostly tall and slender palms with nearly orbicular, palmately cleft, long-petioled leaves, the narrow segments mostly 2-cleft at the apex, the petioles flat, the inflorescence sheathed, paniculately branched, the small, perfect flowers white. Calyx and corolla more or less united into a lobed or truncate cup. Stamens mostly 6, the filaments connate at the base. Ovary 10-celled; style terminal, slender; stigma flat or concave. Drupes small, globose. Seed erect; endosperm horny, not grooved; embryo lateral. [Greek, fan.] About 8 species of Florida, the West Indies and Central America. Type species: *Thrinax parviflora* Sw.

Mature leaves silvery beneath.

Leaves green on both sides, or faintly glaucescent beneath.

1. *T. microcarpa*.

2. *T. Morrisii*.

1. ***Thrinax microcarpa*** Sargent, Gard. & For. 9: 162. 1896.*Thrinax keyensis* Sargent, Bot. Gaz. 27: 86. 1899.*Thrinax praeceps* Cook, Bull. Torr. Club 28: 536. 1901.*Thrinax ponceana* Cook, Bull. Torr. Club 28: 536. 1901.*Thringis laxa* Cook, Bull. Torr. Club. 28: 545. 1901.*Coccothrinax laxa* Beccari, Webbia 2: 333. 1907.

A tree up to 12 m. high, with a trunk 1.5 dm. in diameter, usually much smaller. Leaves 1.5 m. in diameter or less, deeply cleft into many narrow segments, green and shining above, bluish or silvery-white beneath, the ligule blunt or acute, 1.5-2.5 cm. wide; inflorescence 2 m. long or less, as long as the leaves or shorter; pedicels very short, disk-like; perianth about 3 mm. long; filaments nearly triangular; drupes 4-6 mm. in diameter, white, very nearly sessile.

Limestone hillsides and cliffs, Porto Rico, and most abundant in the dry south western districts, where it forms extensive colonies; locally abundant on cliffs of the Arecibo limestone; Mona:—Florida; Bahamas; Cuba. Occasionally planted for ornament in Porto Rico. The leaves are used in making brooms.

2. ***Thrinax Morrisii*** Wendl. Gard. Chron. 11: 104. 1892.

A low palm, often flowering when the trunk is 1 m. high or less (said by natives of Anegada to become 6 m. high). Leaves 1 m. in diameter or less, green on both sides or faintly glaucescent beneath, deeply cleft into many narrow segments; ligule ovate, obtuse, 1-2 cm. wide; inflorescence less than 1 m. long, about as long as the leaves; flowers sessile; perianth about 3 mm. long; fruit about 5 mm. in diameter, white.

Sandy plain, West End, Anegada:—Anguilla.

A solitary tree of a species of this genus or the next was observed, with foliage only on Icaos Island, Porto Rico, in 1923.

10. **COCCOTHRINAX** Sargent, Bot. Gaz. 27: 87. 1899.

Unarmed, tall or low palms, with nearly orbicular, palmately cleft, petioled leaves, the petioles flat, the segments usually 2-cleft at the apex, the sheathed inflorescence paniculately branched, the small perfect pedicelled flowers white. Calyx and corolla united into a 6-lobed perianth. Stamens 9-12; filaments subulate. Ovary 1-celled; style terminal; stigma funnelliform. Drupes small, globose. Seed erect; endosperm grooved; embryo lateral. [Greek, berry-Thrinax.] About 10 species, of Florida and the West Indies. Type species: *Coccothrinax jucunda* Sargent.

1. ***Coccothrinax argentea*** (Lodd.) Sargent, Silva N. A. 14: 85. 1902.*Thrinax argentea* Lodd.; R. & S. Syst. 7: 1300. 1830.*Coccothrinax jucunda* Sargent, Bot. Gaz. 27: 89. 1899.*Thrincoma alta* Cook, Bull. Torr. Club 28: 540. 1901.*Thringis latifrons* Cook, Bull. Torr. Club 28: 545. 1901.*Coccothrinax alta* Beccari, Webbia 2: 331. 1907.*Coccothrinax latifrons* Beccari, Webbia 2: 326. 1907.*Coccothrinax Eggersiana* Beccari, Webbia 2: 321. 1907.*Coccothrinax Eggersiana sanctae-crucis* Beccari, Webbia 2: 323. 1907.*Coccothrinax sancti-thomae* Beccari, Webbia 2: 303. 1907.

Trunk sometimes 10 m. high, usually not more than 6 m., sometimes very short, 1.5-2 dm. in diameter. Leaves nearly orbicular, 7 dm. broad or less, cleft to beyond the middle into narrowly lanceolate, acuminate segments, bright green and shining above, silvery-white beneath, at least when young, the slender

petioles about as long as the blades, their bases expanded into persistent fibrous sheaths; panicles short-stalked, mostly shorter than the petioles; pedicels 1-3 mm. long, thickened in fruit; flowers about 3 mm. broad; stamens usually 9; fruit globose, black, 8-12 mm. in diameter. [*Thrinax parviflora* Krebs and of Eggers.]

Hillsides, at lower elevations, Porto Rico, local in dry and moist districts; Vieques; Culebra; St. Thomas; St. Jan; St. Croix;—Florida; Bahamas; Cuba; Hispaniola; Tobago; Trinidad. Only one tree was known on St. Croix by Eggers in 1876, and we could find only one in 1923. SILVER PALM. TEYER TREE. BROOM TEYER. FAN PALM.

Phoenix dactylifera L., DATIL, DATE PALM, African, planted in Porto Rico and the Virgin Islands, forms a stout, rough trunk up to 10 m. high, with many stiff pinnate leaves 2-4 m. long, the very numerous linear pale green glaucous segments 2-4 dm. long, the lower ones spine-like; the inflorescence is a drooping panicle much shorter than the leaves, the plum-like fruit yellow to black, the linear-oblong seed grooved. Date cultivation has not been successful in our area. In Porto Rico and on Vieques trees have been observed apparently spontaneous from seed of planted ones.

Phoenix canariensis Chabaud, of the Canary Islands, was seen as seedlings at the St. Croix Agricultural Experiment Station in 1923, as also those of a hybrid between this species and the date palm.

Phoenix reclinata Jacq., with a very stout, erect trunk up to 5 m. high or higher, the stiff bright green leaves 3-4 m. long, with many linear segments, the lower segments very rigid and spinelike, the yellowish flowers in large panicles, is occasional in Porto Rico and Virgin Island gardens; it is native of Africa.

Phoenix rupicola T. Anders., East Indian, occasionally planted for ornament in Porto Rico, and St. Thomas, is a low species with bright green leaves, the segments not very rigid, the oblong, small fruit yellow, shining.

Butia capitata (Mart.) Becc., Brazilian, grown at the Mayaguez Agricultural Experiment Station, has recurving pinnate prickly-petioled leaves 1 m. long, with many narrowly linear, dull green segments; the inflorescence is shorter than the leaves, the yellow globose fruit about 1.5 cm. in diameter. [*Cocos capitata* Mart.]

Actinophloeus Macarthurii (Wendl.) Beccari, Australian, luxuriant in Porto Rico gardens, is a very slender, unarmed, pinnate-leaved palm 5 m. high or higher, the linear leaf-segments 2-5 cm. broad, subtruncate and lacerate at the apex, the rather large greenish flowers sessile on long branches of the panicle, the fruiting panicles drooping, dense, the ovoid pointed, slightly fleshy fruit about 1 cm. long. [*Ptychosperma Macarthurii* Wendl.]

Corypha elata Roxb., native of India, or a related species, was represented in the collection at the Agricultural Experiment Station, Mayaguez, in 1923, by a splendid specimen, with a trunk about 6 m. high and 1 m. in diameter, its palmate leaves about 2 m. in diameter, the many segments narrow, the long petioles prickly. The tree was then about 20 years old, and had not yet flowered; its actual botanical determination is therefore uncertain.

Livistona chinensis R. Br., BOURBON PALM, Chinese, planted for ornament in Porto Rico and the Virgin Islands, becomes 6 m. high or higher, with reniform-orbicular, palmately divided leaves 1-1.5 m. broad, their stout petioles spiny, about as long as the blade, the narrowly lanceolate segments with drooping ends and with marginal fibers; the inflorescence is a large stalked drooping panicle, the small smooth globose fruits nearly black.

Pritchardia pacifica Seem. & Wendl., Fijian, planted for ornament in Porto Rico gardens, is a low palm with bright green, petioled, nearly orbicular, incised leaves 1-1.5 m. broad.

Licuola grandis Wendl., native of New Britain Island, occasionally grown for ornament in Porto Rico gardens, is a low erect palm with nearly orbicular, slender-petioled, rather thin leaves 4-6 dm. in diameter, their margins with many short lobes.

Neowashingtonia robusta (Wendl.) Britton, DESERT PALM, native of Southern California, occasionally planted in Porto Rico, is unarmed, the palmate leaves up to 1.3 m. broad, slender-petioled, their numerous linear segments with marginal fibers; its inflorescence is paniculately branched, the small flowers white. Fine specimens, about 10 meters high, bearing the characteristic drooping with-ered leaves were seen in Mrs. Maxwell's garden, Ensenada, in 1923. [*Washingtonia robusta* Wendl.]

Neowashingtonia filifera (Linden) Sudworth, WEEPING PALM, of Lower California, was seen as seedlings at the St. Croix Agricultural Experiment Station in 1923.

Borassus flabellifer L., an East Indian palm, was recorded by West as found on St. Croix prior to 1793 and by Krebs on St. Thomas prior to 1851; it is not known there at the present time.

Caryota urens L., TODDY PALM, WINE PALM, Asiatic, occasionally planted for ornament and interest in Porto Rico, is an unarmed palm, reaching at least 16 m. in height but usually lower, with pinnate leaves 2-4 m. long, their segments obliquely wedge-shaped and toothed; its flowers are borne in large pendulous clusters in the axils and at the nodes; the tree dies after flowering.

Caryota mitis Lour., Malayan, was seen as seedlings at the St. Croix Agricultural Experiment Station in 1923.

Arenga saccharifera Labill., SUGAR PALM, East Indian, occasionally planted for ornament in Porto Rico, is unarmed, has a stout trunk about 6 m. high, immense pinnate leaves up to 7 m. long, with many, dark green, linear-lanceolate alternate segments, the petiole-bases with black matted fibre-masses 6-7 dm. long; the pendulous inflorescence is 1-1.5 m. long, the depressed-globose fruit about 4 cm. thick.

Rhopadostylis Baueri (Hook.) Wendl. & Drude, of the Norfolk and Chatham Islands, seedlings of which were seen at the St. Croix Agricultural Experiment Station in 1923, is a pinnate-leaved palm with a slender trunk, the very numerous segments linear, the flowers in short panicles, the fruit in long drooping clusters, subglobose, red, about 8 mm. in diameter. [*Areca Baueri* Hook.]

Chrysalidocarpus lutescens Wendl., GOLDEN-FRUITED PALM, Madagascan, planted for ornament in Porto Rico, forms smooth clustered slender yellowish trunks up to about 7 m. high; its light green, unarmed, pinnately divided leaves are 2-3 m. long with very numerous linear narrow segments, its fruits small, yellow.

Howea Belmoreana (F. Muell.) Becc., CURLY PALM, native of Lord Howe's Island in the Pacific Ocean, occasionally planted in Porto Rico, is unarmed and

becomes 6 m. high or higher, with pinnate leaves up to 4 m. long; the flowers are borne in elongated panicles, the fruit partly enclosed in notches. [*Kentia Belmoreana* F. Muell.]

Dictyosperma rubrum Wendl. & Drude, East Indian, also in the Mayaguez collection, has a crown of pinnate leaves about 2 m. long and a rather slender cylindrical trunk; the plant had not flowered up to 1923.

Hyophorbe Verschaffeltii Wendl., of the Mascarene Islands, occasionally planted for ornament in the Virgin Islands and luxuriant there, is an unarmed, pinnate-leaved palm 2-3 meters high, the numerous linear acute leaf-segments rather stiff, with recurved ends; the minute flowers are sessile on long slender panicle-branches; the oblong fleshy fruit is black, about 1 cm. long.

Areca Catechu L., BETEL-NUT, Asiatic, planted in Porto Rico, and St. Thom-as is an unarmed palm with a slender trunk up to about 15 m. in height; the pinnate leaves are about 2 m. long or less with many, narrowly lanceolate, plicate segments; the drooping, much branched inflorescence is shorter than the leaves, the flowers small, white, the orange or scarlet ovoid fruit about 5 cm. long.

Areca madagascariensis Mart., native of Madagascar, of which a fine specimen some 10 m. high, was seen at the Mayaguez Agricultural Station in 1923, is unarmed and has the basal part of the trunk enlarged; the leaves are pinnate, nearly 2 m. long, with many narrow segments diverging in several planes; the inflorescence is much shorter than the leaves.

Elaeis guineensis Jacq., OIL PALM, African, seen at the Agricultural Experiment Station, Mayaguez, in 1923, has pinnate, prickly petioled leaves about 3 m. long, with many linear-alternate segments, the petiole-bases fibrous-matted. The plant had not yet flowered. Young plants were seen at the St. Croix Agricultural Station.

Martinezia caryotaefolia H.B.K., GRI-GRI, South American, seen in 1923, at the Agricultural Experiment Station, Mayaguez, is a slender palm, the trunk armed with acicular spines, the spiny pinnate leaves 1-2 m. long, with oblanceolate segments, the flowers in short clusters, the fruit edible.

Rhapis flabelliformis L'Her., native of western Asia, frequently grown for ornament in Porto Rico gardens, is a very slender palm up to 3 m. high, forming colonies; its slender-petioled, palmately divided leaves are 2-3 dm. broad, the 3-10, linear segments incised at the apex, with spinulose margins; its flowers are in paniced spikes.

The fruits of the South American palm **Manicaria saccifera** Gaertn, are occasionally washed up on sea beaches of Porto Rico.

Carludovica palmata R. & P., PANAMA-HAT PLANT, Peruvian, occasionally planted for ornament in Porto Rico, is acaulescent, with flabellate, long-petioled, glabrous leaves, about 1 m. broad, cleft into many linearspreading and drooping segments; the monoecious, apetalous flowers are in dense peduncled spikes, the staminate ones with many stamens, the pistillate maturing into a fleshy syncarp. This genus belongs to the Order *Cyclanthales*, which differs from the Arecales in being herbaceous plants with no perianth, or the perianth nearly rudimentary.

Order 7. **ARALES.**

Perennial herbs, vines or rarely trees. Inflorescence in the *Araceae* a fleshy spadix, subtended by a spathe, or naked. The *Lemnaceae* are minute floating thalloid plants with few or solitary flowers on the margin or back of the thallus.

Large plants, the inflorescence a spadix.

Fam. 1. ARACEAE.

Minute floating thalloid plants with solitary or few flowers.

Fam. 2. LEMNACEAE.

Family 1 **ARACEAE** Neck.

ARUM FAMILY

Terrestrial, epiphytic, or aquatic herbs, sometimes with an acrid or pungent juice, with thick fleshy tuberous rootstocks, corns, or erect creeping or climbing stems. Leaves alternate, radical or cauline, often with sheathing petioles, the blade simple or compound. Spathe green or colored, open to the base or the lower part convolute or tubular, wholly deciduous or persistent, or only the tubular part persistent. Spadix densely flowered, the staminate flowers above, the pistillate below, or the plants wholly dioecious, or with perfect flowers in some species. Perianth, when present, of 4-6, sometimes more, free or connate segments. Stamens 4-6, rarely more; filaments none, or broad and flat, rarely filiform; anthers opening by terminal pores, or by short or long longitudinal slits. Ovary 1-several-celled; ovules 1-several in each cell, orthotropous, campylotropous or anatropous; stigma entire or lobed. Fruit a 1-many-seeded berry. Seeds with fleshy endosperm, or none. About 105 genera and 900 species, mostly of tropical regions, a few in the temperate zone.

Flowers monoecious; perianth none.

Floating stoloniferous stemless herbs.

Terrestrial, sometimes hygrophytic or epiphytic.

Pistillate portion of the spadix adnate to the spathe, the staminate portion free.

Spadix free.

Vines, often high climbing, frequently rooting at the nodes.

Stems erect, or inclining, or acaulescent.

Spadix covered wholly by flowers, the staminate above, the pistillate below, devoid of sterile organs.

Spadix with sterile organs between the staminate and pistillate parts.

Ovary with parietal placenta; leaves peltate.

Ovary with central placenta.

Leaves peltate; style none.

Leaves not peltate; style annular.

Flowers perfect, all fertile; perianth segments 4-8.

Leaf-blades entire; flowers borne on leafy plants; spathe flat or concave.

Leaf-blades and segments parted; flowers and fully developed leaves appearing at different times; spathe hooded.

1. *Pistia*.

2. *Dieffenbachia*.

3. *Philodendron*.

4. *Montrichardia*.

5. *Caladium*.

6. *Cyrtospadix*.

7. *Xanthosoma*.

8. *Anthurium*.

9. *Dracontium*.

1. **PISTIA** L. Sp. Pl. 963. 1753.

Floating stoloniferous stemless herbs with fibrous roots and monoecious flowers. Leaves in a rosette, with parallel veins raised beneath. Spathe small, tubular below, spreading above. Spadix adnate to the back of the tube of the spathe, free above. Pistillate flowers solitary on the lower part of the spadix. Ovary 1-celled. Style obliquely erect. Stigma capitate. Ovules numerous, orthotropous. Staminate flowers above the pistillate, in whorls, each

flower composed of 2 connate, 2-celled anthers, opening by short slits. Fruit with a thin pericarp, many-seeded. Seeds rugulose; testa thick; embryo minute. [Greek, watery, referring to the aquatic habitat.] A single variable species found throughout the tropical and subtropical regions of the globe.

1. **Pistia Stratiotes** L. Sp. Pl. 963. 1753.

Pistia occidentalis Blume, Rumphia 1: 79. 1835.

An aquatic herb with numerous hair-like rootlets. Leaves sessile, occasionally narrowed into a petiole-like base, cuneate-obovate to oval, 3-12 cm. long, 1.5-5.5 cm. broad, arranged in a lettuce-like rosette, notched or entire at the broadly rounded or subtruncate apex, more or less scurfy pubescent on both surfaces, tomentose with long matted hairs at the base; veins prominent beneath, converging within the margin; spathes pale green or whitish, 1.2-1.4 cm. long, more or less villous on the outside; ovary pubescent; fruit ellipsoid; seeds numerous, oblong.

In fresh water ponds and streams, Porto Rico; St. Thomas (cultivated and naturalized in gardens);—West Indies (except Bahamas); subtropical and tropical continental America; Asia; Africa; East Indies. LECHUGILLA DEL RIO. WATER-LETTUCE.

2. **DIEFFENBACHIA** Schott, Melet. 1: 20. 1832.

Perennial herbs with rather thick cylindric, erect or inclined stems and poisonous acrid juice. Leaves borne mostly at or near the top of the stem, the long, half-cylindric petioles sheathed to above the middle. Leaf-blades often variegated, lanceolate to oblong, ovate or obovate-oblong. Spathe narrow with an elongate fleshy persistent tube, the blade a little longer; spadix erect, the pistillate portion aduate to the spathe. Flowers monoecious. Staminate flowers with 4 or 5 stamens; anther-sacs shorter than the connective. Pistillate flowers with 4 or 5 staminodes; ovary 2- or 3-lobed, 1-3-celled; stigma sessile, depressed-globose, 2- or 3-lobed; ovules solitary in each cell, erect, anatropous. Berries included in the tube of the spathe which at length ruptures. Seeds globose or ovoid; testa smooth; endosperm none. [Named in honor of J. F. Dieffenbach, a German botanist, 1794-1847.] About 27 species, natives of tropical America, the following typical.

1. **Dieffenbachia seguine** (Jacq.) Schott, Melet. 1: 20. 1832.

Arum seguine Jacq. Enum. 31. 1760.

Arum seguinum L. Sp. Pl. ed. 2. 1371. 1763.

Caladium seguinum Vent. Hort. Cels. 30. 1800.

Stems 9 dm. or more long, the lower portion often inclined. Leaf-blade elliptic-oblong to ovate-oblong, 22-40 cm. long, 12-19 cm. broad, rounded, slightly cordate or subacute at the base, acute or acuminate at the apex, green or with white, more or less confluent stripes and spots; petioles up to 30 cm. or more long; spathe 18-30 cm. long; spadix white, as long as or shorter than the spathe; berries orange-red.

Wet places, Porto Rico; Vieques; St. Thomas; Tortola;—Jamaica; Hispaniola to Grenada; continental tropical America. RABANO. RABANO CIMARRON. DUMB CANE.

Ornamental races of this or related species are commonly cultivated in Porto Rico and Virgin Island gardens. The sap is irritating to the skin and highly inflammatory to the tongue whence the name Dumb Cane.

3. **PHILODENDRON** Schott, Wiener Zeitschr. 3: 780. 1829.

Stout or slender, often high climbing vines, rarely arborescent or subaculescent. Leaf-blades entire, lobed, tripartite, pinnatifid or 1-2-pinnatisect,

coriaceous or herbaceous. Spathe thick, fleshy, its tube convolute, cylindrical or swollen, its blade ovate, oblong or lanceolate, usually erect. Spadix erect, sessile or short-stipitate. Flowers monoecious. Perianth wanting. Stamens 2-6, united into a sessile obpyramidal body. Ovary 2-many-celled; ovules few or numerous, orthotropous; stigma sessile, entire or lobed. Berry enclosed in the spathe, 1-10-celled, 1-10-seeded. Seeds ovoid, oblong or ellipsoid; testa thick, smooth or striate. Endosperm copious. Embryo axile. [Greek, tree-lover.] About 220 species, natives of tropical America, known as BEJUCO DE CALABAZA. Type species: *Caladium grandifolium* Willd.

Leaf-blades 0.3-3.6 dm. long, 1.5-20 cm. broad, usually not conspicuously ribbed beneath, the lowest pair of ribs not exposed along the edge next to the sinus.

Leaf-blades 3-12 cm. long, 1.5-7 cm. broad.

Leaves variegated copper and green above, greenish-red changing to brownish-red beneath.

Leaves green on both sides.

Petioles with a dilated sheath extending to the apex; leaf-blades 3-7 cm. long, 1.5-3 cm. broad.

Petioles nearly terete; leaf-blades 8-12 cm. long, 4.5-7 cm. broad.

Leaf-blades 1.4-3.6 dm. long, 0.8-2 dm. broad.

Petioles with a dilated sheath extending to the apex or just below; leaf-blade rounded or shallowly cordate.

Petioles not sheathed, or sheathed to the middle or below; leaf-blades usually deeply cordate.

Leaf-blades oblong-ovate.

Leaf-blades broadly cordate-ovate.

Leaf-blade 5-10 dm. long, 4-8 dm. broad, occasionally larger, conspicuously ribbed beneath, the lowest pair of ribs exposed near the base along the edge next to the sinus.

1. *P. micans*.
2. *P. marginatum*.
3. *P. scandens*.
4. *P. lingulatum*.
5. *P. Krebsii*.
6. *P. oxycardium*.
7. *P. giganteum*.

1. **Philodendron micans** (Klotzsch) C. Koch, Ind. Sem. Hort. Berol. 1854: App. 7. 1851.

Solcnostlerigma micans Klotzsch; Urban, Symb. Ant. 4: 134, as synonym. 1903.

Philodendron micans brevipes Engler, Bot. Jahrb. 26: 528. 1899.

Stems very slender, greenish, the internodes 0.4-1.5 dm. long. Petioles 2-8 cm. long, slender, fleshy; leaf-blades herbaceous, oblong to oblong-lanceolate or ovate-lanceolate, 5-8 cm. long, 3.5-5 cm. broad, gradually tapering toward the apex, the base slightly cordate, above shining, variegated copper and green, beneath greenish-red changing to brownish-red, the margin red; midrib slender, white-punctulate toward the base; flowers and fruit unknown.

In forests, Porto Rico;—Dominica; Tobago; Central America.

2. **Philodendron marginatum** Urban, Symb. Ant. 4: 135. 1903.

Stem slender, terete, 1.5-2.5 mm. thick, rooting at the nodes, the internodes 1.5-5 cm. long. Petioles 1.5-5 cm. long, with a dilated sheath extending to the apex; leaf-blade ovate-oblong, 3-7 cm. long, 1.5-3 cm. broad, more or less acuminate at the apex, rounded or slightly cordate at the base, herbaceous, above with minute, rounded, whitish points; nerves more conspicuous beneath than above; inflorescence unknown.

Mountain forests, Porto Rico. Endemic.

3. **Philodendron scandens** C. Koch & H. Sello, Ind. Sem. Hort. Berol. 1853: App. 4. 1853

A vine with slender terete or nearly terete stems. Petioles slender, 4 cm. or more long; leaf-blades ovate, 8-12 cm. long, 4.5-7 cm. broad, occasionally longer and broader, long-acuminate at the apex, cordate at the base; veinlets slender, ascending; inflorescence unknown.

On cliffs and rocky hillsides, Porto Rico;—Cuba; Trinidad?

4. **Philodendron lingulatum** (L.) C. Koch, Ind. Sem. Hort. Berol. App. 2. 1855.

Arum lingulatum L. Sp. Pl. ed 2, 1371. 1763.

Philodendron dispar Schott, Syn. Aroid. 79. 1856.

Philodendron Karstenianum dispar Engl. in DC. Mon. Phan. 2: 362. 1879.

A high-climbing vine. Petioles 1.5–3.5 dm. long, conspicuously winged-vaginate nearly to the base of the blade; leaf-blades oblong-ovate to ovate, 1.8–3.5 dm. long, 1–2 dm. broad, often rather abruptly-acuminate at the apex, rounded or slightly cordate at the base; peduncles 2–5 cm. long; spathe green without, whitish within, 1.5–1.8 dm. long, long-acuminate; spadix cylindrical, short-stipitate.

Mountain woodlands and shaded ravines, Porto Rico:—Saba; St. Eustatius; St. Kitts; Guadeloupe; Martinique; St. Vincent. Recorded by Krebs as formerly found in St. Thomas.

5. **Philodendron Krebsii** Schott, Bonplandia 7: 164. 1859.

Philodendron Wrightii Griseb. Cat. Pl. Cub. 219. 1866.

A high-climbing vine, sometimes 16 m. long, with rather slender stems. Petioles 0.8–2 dm. long, terete or nearly so, vaginate to the middle or slightly beyond on the upper leaves; leaf-blades oblong-ovate to ovate, 1.4–3.6 dm. long, 0.8–2 dm. broad, acute to acuminate at the apex, cordate at the base, the ribs rather inconspicuous, the veinlets slender, numerous; peduncle 1–1.5 dm. long, often rather slender; spathe convolute, cylindrical, 9–13 cm. long, 2 cm. or more in diameter; spadix sessile. [*Arum hederaceum* of Krebs, *P. hederaceum* of Eggers, not of Schott.]

Thickets, wooded hillsides; mountain forests and limestone cliffs, at lower and higher elevations, Porto Rico; St. Thomas;—Cuba; Hispaniola.

6. **Philodendron oxycardium** Schott, Syn. Aroid. 82. 1856.

A high-climbing vine. Petioles 1–2 dm. long; leaf-blade broadly cordate-ovate, 1.5–3 dm. long, 1.2–2 dm. broad, rather abruptly acuminate at the apex, cordate at the base; veinlets numerous, slender, peduncles 2–3 cm. long; spathe thick, 10–12 cm. long; spadix cylindrical. [*P. hederaceum* of Bello, not of Schott.]

Hillside forests, Porto Rico; St. Thomas; Tortola:—Jamaica, Guadeloupe; Dominica; Martinique; St. Vincent; Guatemala; ? Venezuela.

7. **Philodendron giganteum** Schott, Syn. Aroid. 89. 1856.

A robust, more or less sprawling or ascending vine, the thick caudex provided with numerous long coarse aerial roots. Petioles stout, 6–10 dm. or more long, nearly terete, often flattened on the anterior side above the base; leaf-blades cordate-ovate, 5–10 dm. long, 4–8 dm. broad, sometimes larger, dark green and lustrous above, the midrib and lateral ribs impressed, paler beneath, the ribs prominent, the veinlets slender, inconspicuous; peduncle short, stout; tube of the spathe oblong-ellipsoid, 6–8 cm. or more long, purplish without when in flower, in fruit yellowish, dark red within, the blade sublanceolate, 1–1.4 dm. long, 4–5 cm. broad, convolute, acuminate at the apex, pale-green or yellowish; spadix sessile; flowers fragrant.

Wooded limestone hills and forests, Porto Rico; Vieques; St. Thomas (according to Eggers); Tortola:—St. Kitts; Montserrat; Guadeloupe; Martinique; St. Vincent; Trinidad. Occasionally planted for ornament in Porto Rico. YAUTIA CIMARRONA.

4. **MONTRICHARDIA** Crueger, Bot. Zeit. 12: 25. 1854.

Arborescent plants of swamps or coastal marshes, with unarmed or prickly stems. Leaves rosulate at the summit of the stem, the petioles vaginate to the

middle or beyond, clasping at the base, the blades sagittate. Spathe thick, sheathing, at length deciduous. Spadix free, covered wholly by flowers, the staminate above, the pistillate below, devoid of sterile organs. Stamens 3-6. Anthers subsessile. Ovary 1-celled. Ovules 1 or 2, anatropous. Style wanting. Stigma 4-lobed. Seeds without endosperm. [Commemorates Gabriel de Montrichard, of Trinidad.] About 2 or 3 species of tropical America. Type species: *Caladium aculeatum* Meyer.

1. **Montrichardia arborescens** (L.) Schott, Araceen Betreff. 1: 4. 1854.

Arum arborescens L. Sp. Pl. 967. 1753.

Stem erect, 1-2.5 m. high, unarmed, or armed with short, often somewhat flattened prickles. Petioles 1.8-3 dm. long; leaf-blades sagittate-ovate, the basal lobes often equalling or longer than the terminal one; lateral ribs rather prominent beneath, the veinlets slender; spathe 10-12 cm. long, or sometimes longer, externally green, whitish within, the base purplish.

Porto Rico (according to Bello);—Guadeloupe to Trinidad; South America; not found in Porto Rico by recent collectors. YAUTIA MADERA.

5. **CALADIUM** Vent. Mag. Encyc. 6^t: 463. 1801.

[*Colocasia* Schott, Melet. 1: 18. 1832. Not Link, 1795.]

Coarse perennial herbs, tuberous or with a short erect caudex. Leaf-blades ovate-cordate or sagittate-cordate, peltately petioled. Spathe stout-peduncled, persistent. Spadix shorter than the spathe. Flowers monoecious. Perianth wanting. Staminate and pistillate flowers distant, the staminate above the pistillate with interposed flat neutral ones. Stamens 3-5. Ovaries 1-celled, stigma sessile or subsessile, depressed-capitate; ovules numerous, orthotropous. Berries obconic or oblong. Seeds oblong, sulcate; endosperm copious; embryo axile. [From Kelady, an East Indian name.] About 7 species, natives of tropical Asia. Type species: *Arum esculentum* L.

1. **Caladium Colocasia** (L.) W. F. Wight, Contr. U. S. Nat. Herb. 9: 206. 1905.

Arum Colocasia L. Sp. Pl. 965. 1753.

Arum esculentum L. Sp. Pl. 965. 1753.

Caladium esculentum Vent., Jard. Cels 30. 1800.

Colocasia Antiquorum Schott, Melet. 1: 18. 1832.

Colocasia esculenta Schott, Melet. 1: 18. 1832.

Colocasia Colocasia Lyons, Plant Names 111. 1900.

A succulent plant with an edible, starchy, tuberous rootstock, the stout petioles often 1 m. long or more. Leaf-blades ovate-cordate with a triangular basal sinus, 3-4 dm. long, 2-3 dm. broad, sometimes longer and broader, acute or short-acuminate at the apex, cordate at the base; spathe pale yellow, 1.5-3.5 dm. long, stout-peduncled, the tube greenish; spadix shorter than spathe, stipitate.

Naturalized after cultivation in Porto Rico. Native of India. Cultivated in tropical and subtropical regions. MALANGA. YAUTIA MALANGA.

Caladium arborescens Vent., an East Indian species was recorded by Krebs as formerly grown on St. Thomas.

6. **CYRTOSPADIX** C. Koch, Ind. Sem. Hort. Berol. 1853: App. 3. 1853.

Acaulescent herbaceous perennials often with beautifully variegated foliage. Leaf-blades usually peltately-petioled. Flowers monoecious, the staminate ones

separated from the pistillate by numerous abortive ones. Perianth none. Stamens 3-5; anther cells dehiscent by apical slits. Ovary 2-3-celled; stigma sessile, entire or 2-4-lobed; ovules numerous, anatropous. Berries pyriform or clavate, included in the persistent tube of the spathe. Seeds ovoid or subglobose; testa thick, grooved; endosperm copious; embryo axile. [Greek, curved spadix.]

About 16 species, natives of tropical America. Type species: *Philodendron striatipes* Kunth.

1. *Cyrtospadix bicolor* (Ait.) Britton & Wilson.

Arum bicolor Ait. Hort. Kew 3: 316. 1789.

Caladium bicolor Vent. Mag. Enc. 6⁴: 461. 1801.

Xanthosoma sylvestre Bello, Anal. Soc. Esp. Hist. Nat. 12: 114. 1883.

Rhizome depressed-globose. Petioles slender, 2 dm. or more long. Leaf-blades peltate, ovate or triangular-ovate, 1.2-4 dm. long, 0.7-3 dm. broad, acuminate at the apex, cordate at the base, often beautifully colored above, glaucous beneath; spathe 7-14 cm. long. [*Caladium smaragdinum* of Eggers, not of C. Koch & Bouché.]

Persistent after cultivation for ornament. Porto Rico; St. Thomas; St. Croix;—Dominica; Martinique; Guadeloupe; St. Vincent; Barbados; Trinidad; South America. Many ornamental varieties are under cultivation. PALETA DEL PINTOR.

7. *XANTHOSOMA* Schott, Melet. 1: 19. 1832.

Herbs with thick erect stems, or acaulescent. Leaf-blades sagittate, hastate or pedately parted. Flowers monoecious, the staminate ones separated from the pistillate by numerous abortive ones. Stamens 4-6. Ovary ovoid, 2-4-celled; ovules anatropous, numerous in each cell of the ovary; style annular; stigma discoid. Berry 3- or 4-celled, the cells many-seeded. Seeds ovoid; testa sulcate; endosperm copious; embryo axile. [Greek, yellow-body, referring to the stigma.] About 37 species, natives of tropical America, known as YAUTIA, TANIER and MALANGA, much cultivated for their edible corms. Type species: *Xanthosoma Jacquini* Schott.

Leaf-blades simple.

Leaf-blades sagittate; marginal veins almost equally distant from the margin at all points.

Stem of mature plants erect, up to 1 m. tall.

Lowest pair of ribs exposed near the base along the edge next to sinus.

Lowest pair of ribs separated from the sinus by leaf-tissue nearly to the base.

Stem tuber-like, not developed above ground.

Basal lobes of the leaf subtriangular; blade of the spathe yellowish white.

Basal lobes of the leaf subrhomboid or semiovate, obtuse; blade of the spathe dull green.

Leaf-blades hastate, marginal veins varying from the margin at different points.

Leaf-blades pedately-divided into 5-12 segments.

1. *X. Jacquini*.

2. *X. sagittae-folium*.

3. *X. violaceum*.

4. *X. atrovirens*.

5. *X. brasiliense*.

6. *X. helleborifolium*.

1. *Xanthosoma Jacquini* Schott, Melet. 1: 19. 1832.

An ill-smelling herb, with an acrid juice, and tall thick stem sometimes 1 m. long. Petiole 4.5-8 dm. long; leaf-blade broadly cordate-sagittate, 3.8 dm. or more long, 3 dm. or more broad; peduncles 1-3 dm. or more long; tube of the spathe ovoid, green on the outside, purplish within, 5.5-7 cm. long, 2.5-3.5 cm. in diameter, the blade 1-2.5 dm. long, 6-8 cm. broad, pale yellowish-green on the back, whitish within.

Spontaneous after cultivation, Porto Rico;—Lesser Antilles; South America.

2. **Xanthosoma sagittaeifolium** (L.) Schott, Melet. 1: 19. 1832.

Arum sagittaeifolium L. Sp. Pl. 966. 1753.

Mature plants with thick erect stems 1 m. long or more. Petioles up to 1 m. long. Leaf-blades sagittate-ovate, 4-7 dm. long, 4-6 dm. broad, short acuminate at the apex, cordate at the base; peduncles 2 dm. long or more; tube of the spathe oblong-ovoid, 6-7 cm. long, 3.5-4 cm. in diameter, the blade greenish white. 1.5 dm. long, 5-6 cm. broad, acuminate; spadix shorter than the spathe; ovary ovoid.

Cultivated on Porto Rico; naturalized after cultivation on St. Thomas; St. Croix (according to Eggers):—Cuba to Barbados; South America.

3. **Xanthosoma violaceum** Schott, Oesterr. Bot. Wochenbl. 3: 370. 1853.

Rhizome short. Petioles 3-7 dm. long, brownish violet; leaf-blade sagittate-ovate, 2-5 dm. long, 1.5-4 dm. broad, pruinose, becoming green, paler beneath; peduncle 1.5-2 dm. long, 1.5-2 cm. thick; tube of the spathe 1 dm. long, 3.5-4 cm. in diameter, purplish on the outside, the oblong-lanceolate blade yellowish white, 1.5-2 dm. long, 6-7 cm. broad. [*Acontia cubensis* of Bello, not of Schott.]

Naturalized after cultivation in Porto Rico. Cultivated in the West Indies and South America, its native home unknown.

4. **Xanthosoma atrovirens** C. Koch & Bouché, Ind. Sem. Hort. Berol. 1854: App. 3. 1854.

Xanthosoma atrovirens Kochii Engl. Pflanzenreich 4²³ E: 50. 1920.

Rhizome and tuber cylindrical, yellow within. Petiole 3-6 dm. long, thick, blackish-green; leaf-blades sagittate-ovate, 7-8 dm. long, 6 dm. broad, blackish-green above, grayish-green and pruinose beneath, the margin green; peduncle 1-1.5 dm. long, 1.5-2.5 cm. thick; tube of the spathe oblong-ovoid, 8 cm. long, 4 cm. in diameter, green, the ovate-lanceolate blade 2 dm. long, 1 dm. broad, green, the apex purplish.

Cultivated on Porto Rico (according to Engler); cultivated and naturalized on St. Thomas and St. Croix (according to Eggers):—cultivated in Cuba and Jamaica; native of northern South America.

5. **Xanthosoma brasiliense** (Desf.) Engl. Pflanzenreich 4²³ E: 58. 1920.

Caladium brasiliense Desf. Cat. Pl. Hort. Paris ed. 3, 386. 1829.

Xanthosoma hastifolium C. Koch, Ind. Sem. Hort. Berol. 1854: App. 2. 1854.

Acontias hastifolius Schott, Prodr. 194. 1860.

Petioles 2-4 dm. long. Leaf-blades ovate-sagittate or ovate-hastate, 2.5-4 dm. long, with spreading oblong basal lobes; peduncles 1.5 dm. long or more; tube of the spathe oblong-ovoid, 5 cm. long, the blade oblong-lanceolate, 1-1.2 dm. long, 3-4 cm. broad, yellowish-green; ovary short-cylindrical.

Ravines, Porto Rico; Vieques:—Guadeloupe; Martinique; St. Vincent; Panama; Southern Brazil.

6. **Xanthosoma helleborifolium** (Jacq.) Schott, Oesterr. Bot. Zeitschr. 15: 33. 1865.

Arum helleborifolium Jacq. Ic. 3: 18. 1793.

Caladium helleborifolium Vent. Mag. Encyc. 6⁴: 471. 1801.

Acontias helleborifolius Schott, Melet. 1: 19. 1832.

Xanthosoma helleborifolium angustisectum Engl. Pflanzenreich 4²³ E: 61. 1920.

Leaves one or more, the petioles 3-5 dm. long, mottled; leaf-blades 1-2.9 dm. long, 1.5-3.5 dm. broad, pedately divided into 5-12 segments, the segments oblong, lanceolate, or oblanceolate, 5-28 cm. long, 2-7 cm. broad, acuminate at

the apex, narrowed to a sessile base; peduncle 1 dm. long or more; tube of the spathe elliptic-ovoid, 3-4 cm. long, green, the oblong-ovate blade yellowish-green, 6-7 cm. long, ovoid.

Naturalized after cultivation in a ravine at Mayaguez:—Dominica; Martinique; St. Vincent; Trinidad; Central and South America.

Xanthosoma Caracu C. Koch & Bouché, has been cultivated on Porto Rico, according to Engler; it has cordate-sagittate leaves, green and shining above, pale beneath, 3-5 dm. long.

Xanthosoma hastatum Eggers, Bull. U. S. Nat. Mus. 13: 99. 1879. This is an incompletely described plant, known only from its hastate leaves, recorded by Eggers as cultivated and spontaneous in forests in the Virgin Islands, used as spinach. It may not be a *Xanthosoma*.

8. ANTHURIUM Schott, Wiener Zeitschr. 3: 828. 1829.

Terrestrial or epiphytic perennials, with creeping, climbing or arborescent stems. Leaves various, entire, lobed or parted. Flowers perfect. Spathe ovate, elliptic or lanceolate, thick-coriaceous. Spadix sessile or stipitate, cylindrical or conic. Perianth-segments 4. Stamens 4, the filaments compressed, the longitudinally dehiscent anthers extrose. Ovary ellipsoid, ovoid or obovoid, 2-celled. Ovules 1 or 2, anatropous or campylotropous; style short or wanting; stigma disc-like or oblong, somewhat 2-lobed. Berry fleshy, red, greenish, orange or purple, 2-celled, the cells 1-seeded, rarely 2-seeded. Seeds oblong; testa striate, granular or minutely punctate; endosperm fleshy; embryo axile. [Greek, tail-flower.] About 480 species natives of tropical America. Type species: *Pothos acaulis* Jacq.

Scandent shrub, with slender stems and alternate leaves.
Caudex short; leaves rosulate.

1. *A. scandens*.

Leaves palmately-ribbed at the base.

Leaves broadly cordate-ovate or broadly triangular-ovate.
Leaves broadly oblong-lanceolate or oblong-ovate, rounded or subcordate at the base.

2. *A. cordatum*.

Leaves coarsely reticulate-veined; spadix 1.5-3 dm. long, usually long-acuminate.

3. *A. Selloum*.

Leaves not coarsely reticulate-veined; spadix 4-10 cm. long; spathe often abruptly acuminate.

4. *A. dominicense*.

Leaves pinnately ribbed throughout.

5. *A. acaule*.

1. Anthurium scandens (Aubl.) Engl. in Mart. Fl. Bras. 3: 78. 1878.

Dracontium scandens Aubl. Pl. Guian. 2: 836. 1775.

Pothos violacea Sw. Prodr. 32. 1788.

Anthurium violaceum Schott, Melet. 1: 22. 1832.

Anthurium leucocarpum Schott, Oesterr. Bot. Wochenbl. 7: 53. 1857.

Anthurium scandens violaceum Engl. in Mart. Fl. Bras. 3: 78. 1878.

Anthurium scandens leucocarpum Engl. in DC. Monog. Phan. 2: 107. 1879.

A rather slender scandent vine, with alternate leaves and conspicuous fibrous sheaths surrounding the internodes. Petioles 1.5-9 cm. long, slender; leaf-blades narrowly lanceolate to lanceolate-ovate or somewhat oval, 5-14 cm. long, 2-7 cm. broad, acute to acuminate, rarely obtuse at the apex, narrowed or occasionally somewhat rounded at the base; spathe oblong-lanceolate or lanceolate, 1-2 cm. long, 2.5-5 mm. broad, green, pointed; berry globose or subglobose, white or violet; seeds about 2.5 mm. long, 1.5 mm. in diameter.

Commonly epiphytic on trees in mountain forests, Porto Rico:—Jamaica; Hispaniola; Antigua; Trinidad; Margarita; continental tropical America. GUINDA.

2. **Anthurium cordatum** (Willd.) G. Don in Sweet, Hort. Brit. ed. 3, 633. 1839.

Pothos cordata Willd. Enum. Pl. 168. 1809.

Anthurium cordifolium Kunth, Enum. Pl. 3: 76. 1841.

Caudex erect, stout, 1-3 dm. high; petioles 2-6 dm. long, channelled on the face, rounded on the back; leaf-blades broadly triangular-ovate, 3-4 dm. long, 2-3 dm. broad at the deeply cordate base, the sinus open; upper surface bright dark green, the lower paler; peduncles as long as or longer than the leaves; spathe linear-lanceolate, 1-2 dm. long, long-acuminate, green; spadix short-stipitate, 2-2.5 dm. long, brownish-green.

On rocks in forests, St. Thomas; St. Croix; St. Jan; Tortola;—St. Kitts; Martinique. Sometimes confused with *Anthurium grandifolium* (Jacq.) Kunth, apparently recorded by Krebs as *Pothos macrophyllus* Sw. Occasionally grown for ornament in the Virgin Islands. Abundant in the forest on Mt. Eagle, St. Croix, in 1923.

3. **Anthurium Selloum** C. Koch, Ind. Sem. Hort. Berol. App. 8. 1855.

Anthurium macrophyllum Schott, Prodr. 516. 1860.

Caudex short. Petioles somewhat angled, channelled, 3 dm. or more long; leaf-blade broadly oblong-lanceolate, 5-7 dm. long, 1.8-3 dm. broad, subcoriaceous, acuminate at the apex, with a broad open sinus at the base, coarsely reticulate-veined, light green; peduncle channelled and more or less grooved, 6-7 dm. long; spathe linear-lanceolate, pale-green, about 13 cm. long, 1.5 cm. broad, acuminate; spadix 1.5-3 dm. long, short-stipitate.

On trees and rocks in forests, St. Jan. Endemic. Erroneously cited by Engler as from San Juan, Porto Rico.

4. **Anthurium dominicense** Schott, Oesterr. Bot. Zeitschr. 8: 350. 1858.

Anthurium dominicense Sintenisii Engl. Bot. Jahrb. 25: 418. 1898.

Terrestrial or epiphytic. Petioles 1.5-3.5 dm. or more long, channelled; leaf-blades, oblong-lanceolate to oblong-ovate, 2-4 dm. long, 6-16 cm. broad, acuminate at the apex, subcordate or rounded at the base; peduncle 1.5-4 dm. long; spathe oblong or lanceolate, 2.5-5.5 cm. long, 0.8-1.2 cm. broad, acuminate; spadix 4-10 cm. long; berry subglobose, apiculate, reddish.

Mountain forests, Porto Rico;—Dominica; Martinique. LENGUA DE VACA.

5. **Anthurium acaule** (Jacq.) Schott, Melet. 1: 22. 1832.

Pothos acaulis Jacq. Enum. 31. 1760.

Anthurium acaule portoricense Kuntze, Rev. Gen. Pl. 739. 1891.

Anthurium acaule brevipes Engl. Bot. Jahrb. 25: 362. 1898.

Caudex short; petioles 5-25 cm. long, 1 cm. or more thick, grooved; leaf-blades oblong-lanceolate to lanceolate or oblanceolate, 4-8 dm. long, 6-27 cm. broad, acuminate at the apex, sometimes abruptly narrowed below the middle and rounded or cuneate at the base, coriaceous, coarsely reticulate-veined; peduncle 2.5-8 dm. long; spathe linear-lanceolate, 6-12 cm. long, long-acuminate at the apex, rufescent on the inside; spadix slender, 10-30 cm. long; "berry bright red"; seeds ellipsoid to somewhat ellipsoid-ovoid, about 4 mm. long, 2 mm. broad; testa verrucose. [Recorded by Bello as *Anthurium Hugelii* Schott and *A. lanceolatum* Kunth.]

Epiphytic or terrestrial on shaded hillsides, cliffs or ravines, Porto Rico, ascending to at least 950 m.; Culebra; Vieques; St. Thomas; St. Jan; Tortola; St. Croix;—Hispaniola; Martinique; Tobago; Trinidad. FLOR DE CULEBRA, MOCA DE PAVO, HOJA DE COSTADO.

Anthurium crassinervium (Jacq.) Schott, Panamanian, recorded by Krebs as formerly found in St. Thomas, was presumably an error in determination. [*Pothos crassinervia* Jacq.]

9. **DRACONTIUM** L. Sp. Pl. 967. 1753.

Tuberous herbs with long-petioled leaves, 3-parted leaf-blades, and perfect ill-scented flowers. Perianth segments 4-8. Stamens 4-6, in 2 series, rarely 9-12 and in 3 or 4 series. Filaments dilated. Anther-sacs narrowly elliptic, dehiscent at the apex. Ovary incompletely 2-5-celled; ovules solitary in the cells, anatropous or campylotropous; stigma 2-5-parted. Fruit baccate, indistinctly 2-5-lobed, 2-5-celled, the cells 1-seeded. Seeds round-reniform, somewhat compressed; embryo curved. [Derived from the Greek for dragon.] About 10 species, natives of tropical America, the following typical.

1. **Dracontium polyphyllum** L. Sp. Pl. 967. 1753.

Acaulescent. Petioles 1 m. or more long, the base 2-3 cm. thick, more or less mottled; blade 7-8 dm. long and about as wide, 3-parted, the middle segment usually 3-parted from the middle, the two lateral often 2-parted below the middle, the secondary division irregularly pinnately-parted; peduncle of the flower-bearing spathe very short, about 1.5 cm. long, smooth below, verrucose toward the apex; spathe oblong, deep violet, 1.5 dm. long, 7 dm. broad, cuspidate-acuminate; spadix short-stipitate, purplish; berry subglobose, 8-10 mm. long, crowned with a short stigma.

In fields, Porto Rico:—Hispaniola; Guiana. GUAPA.

Monstera deliciosa Liebm., a native of Mexico and Central America, is occasionally planted in Porto Rican gardens. It is a high climbing vine, sometimes 7 m. or more long, the thick cylindrical stems provided with long rope-like aerial roots, the broad pinnatifid and perforated coriaceous evergreen leaves 3-6 dm. or more long, the broad boat-like spathes 2-2.5 dm. long, the mature cylindrical spadix edible.

Aglaeonema pictum Kunth, of Sumatra, grown for ornament in Porto Rico gardens has slender stems about 6 dm. long, ovate blotched leaves 10-15 cm. long, the spathe about 5 cm. long.

Spathiphyllum lanceifolium (Jacq) Schott, Venezuelan, recorded by Krebs as growing in St. Thomas prior to 1851, has elliptic lanceolate leaves 3-5 dm. long and a white spathe about 1.5 dm. long. [*Dracontium lanceifolium* Jacq.]

Arum pictum L., of Corsica and Sardinia, also recorded by Krebs as grown on St. Thomas prior to 1851, is a tuberous plant, with long-petioled ovate cordate leaves about 1.5 dm. long, the short-peduncled spathe 7-9 cm. long.

Alocasia metallica Schott, Malayan, grown in Virgin Island and Porto Rican gardens, is an ornamental aroid, acaulescent, with purple petioled ovate sagittate leaves up to 1.5 meters long, the scapes 2-3 dm. long, the white spathe 1-1.5 dm. long.

Family 2. **LEMNACEAE** Dumort.

DUCK-WEED FAMILY.

Small or minute floating herbaceous perennial stemless plants, consisting of disc-like, elongated or irregular fronds, with sometimes one or more rootlets. Inflorescence consisting of 1 pistillate and 1 or 2 staminate flowers, born on the edge on the upper surface of the frond. Staminate flower of a single stamen, with 2-4 pollen-sacs. Pistillate flowers of a single flask-like pistil with 1-several ovules. Fruit a 1-7-seeded utricle.

The family comprises the smallest of the flowering plants and contains 4 genera and about 26 species of wide distribution.

Rootlet solitary.
Rootlets several, fasciated.

1. *Lemna*.
2. *Spirodela*.

1. **LEMNA** L. Sp. Pl. 970. 1753.

Fronde 1-5-nerved. Rootlets solitary, without fibro-vascular bundles. Anthers bilocellate, dehiscing transversely. Ovary 1-celled; style and truncate or funnel-shaped stigma simple. Fruit more or less ribbed. Endosperm of the seed in one or three layers. [An old Greek name, probably referring to the swampy habitat.] About 10 species of temperate and tropical regions. Known as DUCK-WEED. Types species: *Lemna trisulca* L.

1. **Lemna perpusilla** Torr. Fl. N. Y. 2: 245. 1843.

Lemna paucicostata Hegelm.; Engelm. in A. Gray, Man. ed. 5, 681. 1868.

Fronde oblong to obovate, 2-3.5 mm. long, 1.2-2.5 mm. broad, obscurely 3-nerved, solitary or coherent; rootcap pointed; fruit ovoid to oblong-ellipsoid, ending in a rather prominent eccentric style; seed ellipsoid or ovoid, somewhat compressed; seed-coat thick, ribs prominent.

In still fresh water, Porto Rico; St. Croix; St. Jan (according to Eggers):—West Indies; continental America; also reported from the Old World.

2. **SPIRODELA** Schleid. Linnaea 13: 391. 1839.

Fronde 5-15-nerved. Rootlets several, fascicled, provided with a single bundle of vascular tissue. Anthers bilocellate, dehiscing longitudinally. Fruit rounded, lenticular, with winged margins. [Greek, in allusion to the cluster of rootlets.] Two or three species, the following typical.

1. **Spirodela polyrhiza** (L.) Schleid. Linnaea 13: 392. 1839.

Lemna polyrhiza L. Sp. Pl. 970. 1753.

Fronde elliptic-obovate to orbicular-obovate, 3-8 mm. long, 1.8-6 mm. broad, dark green above, slightly convex and purple beneath, thick, palmately 5-15-nerved.

Ditches, rivers and lakes, Porto Rico:—Almost cosmopolitan.

Order 8. **XYRIDALES.**

Terrestrial, bog-inhabiting, or epiphytic plants. Flowers usually complete, their parts mostly in 3's or 6's. Corolla regular or nearly so (except in some *Commelinaceae*). Ovary superior or inferior. Fruit a capsule or utricle, or baccate. Seed with mealy endosperm.

Ovary 1-celled.

Fam. 1. XYRIDACEAE.

Ovary 2-3-celled.

Sepals 3; petals 3.

Epiphytic or terrestrial plants; leaves scurfy; inflorescence usually spicate or paniculate, often with conspicuous bracts.

Fam. 2. BROMELIACEAE.

Terrestrial herbs; leaves not scurfy; inflorescence cymose or umbellate, commonly subtended by a spathe-like or leaf-like involucre.

Fam. 3. COMMELINACEAE.

Perianth 6-lobed.

Fam. 4. PONTEDERIACEAE.

Family 1. **XYRIDACEAE** Lindl.

YELLOW-EYED GRASS FAMILY.

Annual or perennial herbs, with narrow leaves sheathing the base of a naked scape. Flowers perfect, single in the axils of coriaceous scale-like bracts, which are densely imbricated in a head. Sepals 3, the two lateral ones small, boat-shaped, persistent, the third one larger, membranous (or

wanting). Petals 3, yellow or sometimes white, with claws, which cohere more or less. Fertile stamens 3, inserted on the claws of the petals, usually alternating with 3 plumose or bearded staminodia. Ovary 1-celled or incompletely 3-celled, with 3 parietal placentae. Ovules numerous, orthotropous. Stigmas 3, terminal. Fruit an oblong 3-valved capsule. Embryo apical. Endosperm fleshy.

The family comprises 2 genera and about 50 species, natives of temperate and tropical regions of both the Old World and the New.

1. **Xyris** [Gronov.] L. Sp. Pl. 42. 1753.

Characters of the family. [Greek name for some plant with 2-edged leaves.] About 40 species, widely distributed in temperate and tropical regions, known as YELLOW-EYED GRASS. Type species: *Xyris indica* L.

Lateral sepals included; leaf-blades 2.5–5.5 mm. broad.
Lateral sepals exserted; leaf-blades 1.5–2.5 mm. broad.

1. *X. Jupicai*.
2. *X. Elliottii*.

1. **Xyris Jupicai** L. C. Rich. in Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Xyris communis Kunth, Enum. 4: 12. 1843.

Leaves linear, 2.5–5.5 mm. broad. Scapes solitary or clustered, 2–6 dm. tall, often somewhat flattened, the edges minutely roughened; sheath shorter than the leaves; mature spikes ellipsoid or ovoid, 10–20 mm. long, 6–8 mm. broad; lateral sepals 4–5 mm. long, included; wing narrower than the sepal-body, fimbriate to below the middle. [*Xyris americana* of Bello, not of Aublet.]

Moist sandy soil, northern coastal plain, Porto Rico:—southeastern United States; Cuba; Hispaniola; Jamaica; Trinidad; Central and South America.

2. **Xyris Elliottii** Chapm. Fl. S. States 500. 1860.

Xyris brevifolia Ell. Bot. S. C. & Ga. 1: 52. 1816. Not Michx. 1803.

Leaves narrowly linear, grass-like, 1–2.5 mm. broad, often somewhat twisted. Scapes 2–5 dm. tall, twisted, flattened, 2-edged throughout or only 1-edged below, roughish on the edges; sheath shorter than the leaves; spikes ellipsoid, or somewhat ovoid, 8–18 mm. long, 5–7 mm. broad; bracts with thin eroded edges; lateral sepals 4.5–5 mm. long, exserted; wing incised-lacerate above the middle.

In moist sandy places, Porto Rico:—southeastern United States; Cuba.

Family 2. **BROMELIACEAE** J. St. Hil.

PINE-APPLE FAMILY.

Mostly epiphytic herbs, some species terrestrial, mostly scurfy or lepidote, with elongated, entire or spinulose-serrate leaves. Flowers spiked, panicle, or solitary, regular and perfect, usually conspicuously bracted. Perianth of 3 thin distinct or somewhat united sepals, and 3 clawed distinct or united petals. Stamens 6, usually inserted on the base of the corolla. Ovary inferior or superior, 3-celled; ovules numerous in each cavity, anatropous; style short or elongated; stigmas 3. Fruit capsular or baccate, sometimes fleshy. Seeds numerous, naked, winged or plumose, the testa membranous. Embryo small, situated at the base of the copious endosperm. About 45 genera and 900 species, all natives of tropical and subtropical America.

- Fruit baccate or indehiscent; seeds unappendaged, ovary inferior.
 Pollen-grains eporose.
 Pollen-grains porose.
 Petals eligulate.
 Inflorescence of dense, cone-like spikes.
 Inflorescence paniculate.
 Petals ligulate.
 Fruit aggregate; terrestrial herbs.
 Fruit not aggregate; epiphytic herbs.
- Fruit capsular, dehiscent; seeds mostly winged or comose; ovary partly or wholly superior.
 Seeds winged.
 Seeds comose.
 Petals distinct.
 Style short or none; flowers not distichous.
 Style filiform; flowers mostly distichous.
 Stems filiform, drooping; flowers mostly solitary.
 Stems not filiform; inflorescence spicate or paniculate.
 Petals eligulate.
 Petals ligulate.
- Petals connate.
 Inflorescence mostly simple, the flowers solitary in the axils of the bracts.
 Inflorescence mostly paniculate, with 2-7 flowers in the axils of the bracts.
1. *Bromelia*.
 2. *Hohenbergia*.
 3. *Wittmackia*.
 4. *Ananas*.
 5. *Aechmea*.
 6. *Pitcairnia*.
 7. *Catopsis*.
 8. *Dendropogon*.
 9. *Tillandsia*.
 10. *Neovriesia*.
 11. *Guzmania*.
 12. *Thecophyllum*.

1. **BROMELIA** [Plum.] L. Sp. Pl. 285. 1753.

Large terrestrial stoloniferous herbs, with narrow tufted spiny-margined and spine-tipped leaves, the inflorescence short or elongated, capitate or paniculate. Flowers perfect. Sepals distinct or partly connate. Petals convolute. Stamens 6, shorter than the petals; filaments stout; anthers linear, pollen-grains globose, without pores. Ovary inferior, 3-celled, more or less stipitate; style stout, trigonous; stigmas narrow; ovules few or numerous, not appendaged. Fruit baccate, indehiscent; seeds flat, horizontal, wingless. [Commemorates Olans Bromel, 1639-1705, physician and botanist in Gothenberg.]

About 25 species, natives of tropical America, extending south to Argentina, the following typical.

1. **Bromelia Pinguin** L. Sp. Pl. 285. 1753.

Leaves many, tufted, stiff, linear, long-attenuate, 1-2 m. long, 2-4 cm. wide, light green, the margins armed with stout, rather distant hooked prickles 5-10 mm. long. Inflorescence paniculate, shorter than the leaves, stout, densely white-floccose; bractlets narrow, 5-25 mm. long; sepals narrow, erect, triangular-subulate; petals white or pinkish, about 3 cm. long, linear-elliptic, united below, the apex white-tomentose; stamens about 2 cm. long; anthers yellow, linear, 1-1.4 cm. long; ovary white-farinose, subterete. Berry ovoid, yellow, beaked, verruculose, 3-4 cm. long.

Thickets, hedges and waste grounds, Porto Rico; St. Thomas, St. Jan, St. Croix; —West Indies and continental tropical America. PINUELA. MAYA. PINGUIN.

Bromelia Karatas L., is recorded as Porto Rican by Bello in Anal. Soc. Esp. Hist. Nat. 12: 121. 1883. It is not otherwise known within the geographical area of this book, and may have been in cultivation. The bases of its long, prickle-armed leaves are clothed with brown wool; the inflorescence is capitate.

2. **HOHENBERGIA** Schultes f.; R. & S. Syst. Veg. 7: 1251. 1830.

Large epiphytic or terrestrial herbs, with linear rosulate, spinulose-margined leaves, the scapose inflorescence of racemose spicate or paniced, dense, bracteolate spikes of white or blue, perfect flowers. Sepals distinct or slightly connate,

mucronate or spinulose-tipped. Petals distinct or nearly so, flat, acute, eligulate. Filaments filiform or somewhat dilated; anthers nearly linear; pollen-grains with 4 pores. Ovary inferior, 3-celled; style rather stout; ovules numerous, caudate or naked. Fruit indehiscent, not fleshy, crowned by the persistent sepals. Seeds curved, unappendaged. [Commemorates Hohenberg, an obscure botanist.]

About 30 species, natives of the West Indies, northern South America and Brazil. Type species: *Hohenbergia stellata* Schultes f.

Bracteoles 1-1.5 cm. long; spikes 2-3 cm. long.

Leaves abruptly acute; inflorescence floccose; lower spikes stalked.

Leaves gradually attenuate; inflorescence glabrous; spikes sessile or the lower ones short-stalked.

Bracteoles about 2.5 cm. long; spikes 4-6 cm. long, short-stalked or sessile.

1. *H. portoricensis*.

2. *H. attenuata*.

3. *H. antillana*.

1. *Hohenbergia portoricensis* Mez, in DC. Mon. Phan. 9: 136. 1896.

Leaves subchartaceous, little dilated at the base, minutely lepidote at least beneath, 4-6 dm. long, 3-6 cm. wide, the spinulose tip abruptly acute, the margins armed with spinules about 1 mm. long. Scape slender, glabrous, more or less shorter than the leaves, its sheaths lanceolate, long-acuminate, sometimes spinulose-margined; inflorescence 2-3 dm. long, loosely floccose; bracts similar to the sheaths of the scape; spikes several, rather distant, ellipsoid, 2-3 cm. long, the lower ones on stalks about 2 cm. long, the stalks of the upper ones shorter; bracteoles broadly ovate, strongly veined, 1-1.5 cm. long, tipped with a rather stout spine; sepals 6-7 mm. long, spine-tipped; fruit shorter than the bractlets.

On trees and rocks in the eastern mountains of Porto Rico. Endemic.

2. *Hohenbergia attenuata* Britton, sp. nov.

Leaves subcoriaceous, little dilated at the base, minutely lepidote beneath, 2-4 cm. wide, the apex gradually attenuate into a spine 1-1.5 cm. long, the margins armed with curved spinules 1-1.5 mm. long. Scape rather slender, glabrous, much shorter than the leaves, its narrowly lanceolate sheaths spinulose-margined; inflorescence 1-3 dm. long, glabrous; bracts similar to the sheaths of the scape; spikes several, approximate, 2-3 cm. long, all short-stalked or sessile; bracteoles ovate or ovate-lanceolate, 1-1.3 cm. long, attenuate into a rather weak spine.

On rocks, Sierra de Naguabo. Endemic. Type from hillsides near Rio Icaeo (Shafer 3567); also on Loma Icaeo (Shafer 3401.)

A leaf of a barren plant at Hato Arriba near Arecibo (Britton & Cowell 1987) may be referable to this species.

3. *Hohenbergia antillana* Mez, in DC. Mon. Phan. 9: 137. 1896.

Leaves coriaceous, stiff, slightly dilated at the base, densely minutely lepidote beneath, 5-12 cm. wide, often 1.5 m. long, the apex gradually or rather abruptly acute, and spine-tipped, the marginal spinules of the upper part minute, those of the lower part curved, 1-2.5 mm. long, or some leaves nearly unarmed marginally. Scape stout, white-farinoso, much shorter than the leaves, its chartaceous sheaths lanceolate, spine-tipped and usually spinulose-margined, appressed; inflorescence dense, 1-3 dm. long, floccose, the spikes 4-6 cm. long, approximate, sometimes as many as 24, the lower ones on stalks 1.5-2.5 cm. long; bracts similar to the sheaths of the scape; bracteoles 2-2.5 cm. long, broadly ovate, striate-veined, acute, tipped with short stout spines; sepals about 1 cm. long; petals about 1.5 cm. long; fruit 2-winged, about 8 mm. in diameter.

On shaded limestone rocks and also on trees, northern districts of Porto Rico and near Guanica. Endemic.

3. **WITTMACKIA** Mez, in Mart. Fl. Bras. 3³: 274. 1891.

Large epiphytic or terrestrial herbs, with nearly linear spinulose-margined leaves, the scapose inflorescence paniculate. Flowers perfect. Sepals distinct or nearly so, laterally membranous, winged, the apex spinulose. Petals linear, acute, distinct, eligulate, recurved at anthesis. Stamens 6, not as long as the petals; filaments slender, dilated at the base; anthers ellipsoid; pollen-grains 2-porose. Ovary inferior, compressed, 3-celled; style filiform; stigma lobes elongated; ovules numerous. Fruit indehiscent, not fleshy; seeds curved, unappendaged. [In honor of Marx Carl Ludwig Wittmack, German botanist, born 1839.]

Four known species, of the West Indies and Brazil, the following typical.

1. **Wittmackia lingulata** (L.) Mez, in Mart. Fl. Bras. 3³: 275. 1891.

Bromelia lingulata L. Sp. Pl. 285. 1753.

Chevalliera lingulata Griseb. Fl. Br. W. I. 591. 1864.

Leaves rosulate, rigid, 5-10 dm. long, 4-6 cm. wide, the base concave somewhat broader, the apex rather abruptly acutely tipped, the margins closely armed with slightly curved prickles 1-2 mm. long, the under surface somewhat lepidote. Scape elongated, floccose when young, bearing lanceolate, acuminate bracts; branches of the inflorescence several, suberect, somewhat curved, 1-2 dm. long, flowers sessile; bractlets linear-lanceolate, long-attenuate; sepals 5-6 mm. long; petals acute, 10 mm. long, much larger than the stamens; fruit 8-10 mm. long.

Rocky thickets, 6 kilometers from Rio Piedras towards Caguas, Porto Rico; Vieques; Culebra; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Martinique to Trinidad.

4. **ANANAS** Mill. Gard. Dist. Abr. ed. 4. 1754.

A terrestrial herb, with many, rosulate, linear, stiff leaves, their margins densely armed with hooked prickles, the perfect flowers densely spicate at the summit of a short or elongated scape. Sepals distinct, erect, obtuse. Petals distinct, convolute, ligulate. Stamens shorter than the petals; filaments filiform; anthers linear, acute, sagittate; pollen-grains 2-porose. Ovary inferior, 3-celled; style filiform. Fruit aggregate, syncarpous, fleshy and watery, the connate berries tipped by the withering-persistent perianth; seeds (usually wanting in cultivated races) unappendaged. [Name Brazilian.] A monotypic genus.

1. **Ananas Ananas** (L.) Cockerell, Proc. U. S. Nat. Mus. 19: 776. 1897.

Bromelia Ananas L. Sp. Pl. 285. 1753.

Ananas sativus Schultes f.; R. & S. Syst. 7: 1283. 1830.

Leaves 1 m. long or less, 1-1.5 cm. wide, lepidote on both sides at sheathing base, the apex spiny, the marginal prickles horny, about 2 mm. long. Scape erect, mostly shorter than the leaves, its sheaths with spinulose margins; spikes 4-10 cm. long; flowers erect-ascending; sepals 5-7 mm. long; petals violet, about 15 mm. long, clawed, dilated at the apex; syncarpous fruit in the wild plant usually not over 10 cm. long, in culture much longer.

Sparingly established after cultivation in Porto Rico. Native of Brazil. Widely cultivated for its fruit in tropical and warm-temperate regions. PINE-APPLE. Pine-apples are one of the most important products of Porto Rico, especially on the northern coastal plain and among the haystack hills of the Arcibo limestone.

5. **AECHMEA** R. & P. Fl. Per. 3: 37. 1802.

Acaulescent, mostly epiphytic herbs, with narrow, rosulate, usually spinulose-margined leaves and perfect flowers in simple or paniced spikes, or rarely race-

mose: Sepals distinct or more or less connate, convolute. Petals convolute, connivent above, ligulate. Stamens shorter than the petals; pollen-grains porose. Ovary inferior, 3 celled; style shorter than the stamens; stigma-lobes linear. Fruit baccate or coriaceous, indehiscent, crowned by the persistent sepals. Seeds roughened, unappendaged. [Greek, pointed, referring to the armament.] About 120 species, natives of tropical America. Type species: *Aechmea paniculata* R. & P.

1. **Aechmea nudicaulis** (L.) Griseb. Fl. Br. W. I. 593. 1864.

Bromelia nudicaulis L. Sp. Pl. 286. 1753.

Leaves linear, 3-5 dm. long 2-7 cm. wide, densely lepidote beneath, the apex more or less abruptly spinulose-mucronate, the margins armed with brown spinules 1.5-3 mm. long. Scape slender, nodding, often as long as the leaves, its sheaths narrow, unarmed; flowers in a simple dense spike 5-10 cm. long; bracteoles minute or none; sepals unsymmetric, distinct, the apex spinulose; petals yellow, acute, about 12 mm. long; pollen-grains 2-porose; berry subglobose; seeds 2 mm. long, brown.

On trees at lower elevations, Porto Rico:—Cuba; Hispaniola; Trinidad; continental tropical America.

Aechmea paniculata R. & P., recorded by Krebs as found on St. Thomas, is an error in record or in determination.

6. **PITCAIRNIA** L'Her. Sert. Angl. 7. 1788.

Herbs, mostly terrestrial or saxicolous, the tufted linear leaves often dimorphous, spinulose-margined or entire, the flowers perfect, showy, the inflorescence usually scapose. Sepals distinct, convolute, acute or mucronate. Petals distinct, mostly red or yellow, ligulate or eligulate, narrow. Stamens as long as the petals or shorter; filaments slender, linear; anthers narrowly linear pollen-grains ellipsoid. Ovary partly superior; style filiform; stigma obliquely capitate; ovules numerous. Fruit capsular, septically 3-valved; seeds numerous, variously winged. [Commemorates Dr. William Pitcairn, 1711-1791.]

About 140 species, natives of tropical America. Type species; *Pitcairnia bromeliifolia* L'Her.

Bractlets short, mostly shorter than the pedicels.
Bractlets equalling the pedicels or longer.

1. *P. angustifolia*.
2. *P. latifolia*.

1. **Pitcairnia angustifolia** (Sw.) Redoute, Lil. 2: pl. 76. 1805.

Hepetis angustifolia Sw. Prodr. 56. 1788.

Pitcairnia alta Hassk. in Verh. Naturk. Ver. Ned. Ind. 1: 5. 1856.

Leaves linear, sometimes 1 m. or more long, 1.5-2.4 cm. broad at the middle, glabrous above, white-furfuraceous beneath or glabrous, the margin distantly serrate throughout with small spine-like teeth; peduncle slender, sometimes 6 dm. or more long; inflorescence many-flowered, branched, rarely simple; bractlet lanceolate to ovate-lanceolate, 3-8 mm. long, acuminate; pedicels ascending, 4-10 mm. long; sepals oblong-lanceolate, 1.5-2.3 mm. long; petals bright red, 4.5-5 cm. long, acute; stamens nearly as long as the petals; capsule angled, 13-15 mm. long.

On rocks at lower and middle elevations, Porto Rico; Vieques; St. Thomas, St. Croix; St. Jan; Tortola:—Cuba; St. Kitts to Grenada.

2. *Pitcairnia latifolia* Soland.; Ait. Hort. Kew. 1: 401. 1789.*Hepetis latifolia* Raeusch. Nom. ed. 3, 91. 1797.*Pitcairnia ramosa* Jacq. Eclog. 1: 151. 1811-1816.*Pitcairnia latifolia furfuracea* Baker, Brom. 92. 1889.*Hepetis ramosa* Mez, in DC. Mon. Phan. 9: 974. 1896.

Leaves linear, 6-10 dm. long, 2-2.5 cm. broad, glabrous above, more or less white-furfuraceous beneath, armed on the margin near the base with few, small, dark brown spine-like teeth, occasionally also armed toward the apex; peduncles 4-6 dm. long; inflorescence branched or simple; bractlets lanceolate, 12-17 mm. long, acuminate; pedicels arachnoid-pubescent, 5-11 mm. long; sepals oblong-lanceolate, 16-20 mm. long; petals bright red, 4.5-5 cm. long, the apex acutish; capsule shorter than the calyx, 14 mm. long, 9 mm. broad.

On rocks in forests, Porto Rico; St. Croix;—Cuba; Hispaniola; St. Eustatius to St. Vincent. Recorded by Krebs as formerly found in St. Thomas; it is not known to occur there at present.

Pitcairnia bromeliaefolia Ait., Jamaican, was recorded by Krebs as found in St. Thomas prior to 1851, the record presumably erroneous.

7. **CATOPSIS** Griseb. Fl. Br. W. I. 599. 1864.

Epiphytic herbs, the basal leaves tufted, lepidote, entire, the flowering stem scapose, usually longer than the leaves, the inflorescence spicate or paniculate, the white or yellow flowers sessile. Flowers perfect or nearly so. Petals distinct. Stamens shorter than the petals, those of pistillate flowers very short, with sterile anthers, those of staminate or perfect flowers with slender filaments and ovate or elliptic anthers. Ovary of pistillate or perfect flowers ovoid or ellipsoid; style shorter than the ovary or none. Capsule septicidally dehiscent above the middle. Seeds thick, comose. [Greek, a view, the significance not evident.] About 16 species, of tropical and subtropical America. Type species: *C. nutans* (Sw.) Griseb.

Leaves long-attenuate from a broad base; inflorescence paniculate.	1. <i>C. nutans</i> .
Leaves lingulate, blunt or mucronate.	
Inflorescence paniculate; style very short.	2. <i>C. nitida</i> .
Inflorescence simply spicate or of 2 or 3 branches; style about 2 mm. long.	3. <i>C. sessiliflora</i> .

1. *Catopsis nutans* (Sw.) Griseb. Fl. Br. W. I. 599. 1864.*Tillandsia nutans* Sw. Prodr. 56. 1788.

Scape slender, 6 dm. long or less. Leaves light green, 1-3 dm. long, tapering from a base 2.5-5 cm. broad to a long-attenuate tip; sheaths of the scape erect, ascending or nodding; inflorescence large, paniculate, sometimes 2 dm. long, or sometimes reduced to a few branches, its branches naked below, densely several-many-flowered above; bracts of the inflorescence attenuate, 2-5 cm. long; bracteoles broadly ovate, rounded, brownish, about 6 mm. wide, shorter than the sepals; flowers 6-7 mm. long; sepals elliptic, obtuse; petals white, elliptic, rounded, a little longer than the sepals; style very short; capsule pointed, about 8 mm. long.

On trees in forests, Porto Rico; St. Thomas, St. Jan, Tortola;—Florida; Jamaica; Cuba; Hispaniola; Antigua to Trinidad; Central America.

2. *Catopsis nitida* (Hook.) Griseb. Fl. Br. W. I. 599. 1864.*Tillandsia nitida* Hook. Exotic Fl. 3: pl. 218. 1826.

Scape slender, about as long as the leaves or shorter. Leaves 1.5-3 dm. long or the outer ones shorter, 2-4 cm. wide, lingulate, narrowed upward to the

rounded, mucronulate apex; sheaths of the scape and bracts of the inflorescence short; inflorescence paniculate, sometimes with but few branches, the branches naked below, densely several-flowered above; bracteoles broadly ovate, rounded, shorter than the sepals, about 5 mm. long; sepals unsymmetric, elliptic, shorter than the yellowish white elliptic petals; style scarcely any; capsule pointed, about 8 mm. long.

On trees in mountain forests, Porto Rico:—Jamaica; Cuba; Hispaniola; Martinique; Guadeloupe; Trinidad; continental tropical America.

3. **Catopsis sessiliflora** (R. & P.) Mez, in DC. Mon. Phan. 9: 625. 1896.

Tillandsia sessiliflora R. & P. Fl. Per. 3: 42. 1802.

Scape slender, 1.5–3 dm. long, its sheaths short. Leaves lingulate, 2 dm. long or less, 1.5–2.2 cm. wide, the apex rounded or obtuse and mucronate. Inflorescence a simple spike 5–10 cm. long or with two or three nearly erect branches; rachis straight; bracteoles about one-half as long as the broad sepals; petals ovate or ovate-lanceolate, white, about as long as the sepals; style manifest; capsule 10–12 mm. long.

On trees, Sierra de Naguabo:—Cuba; Guadeloupe, Martinique; Tobago; continental tropical America.

8. **DENDROPOGON** Raf. Neog. 3. 1825.

Pendulous, much-branched plants, with thread-like stems and branches, very narrow entire leaves and yellow or greenish flowers. Sepals distinct or very nearly so. Petals distinct. Stamens long, the 3 inner ones borne on the bases of the petals; filaments filiform; anthers linear. Ovary superior; style columnar; stigmas short. Capsule septicidally 3-valved. Seeds erect, narrow, supported on a long funiculus which splits into fine threads. [Greek, tree-beard.] About 3 species, the following typical.

1. **Dendropogon usneoides** (L.) Raf. Neog. 3. 1825.

Renalmia usneoides L. Sp. Pl. 287. 1753.

Tillandsia usneoides L. Sp. Pl. ed. 2, 411. 1762.

Stems flexuous, hanging clustered in festoons from the branches of trees, 1–8 m. long, gray and, like the filiform leaves, densely silvery-scurfy all over. Leaves scattered, 2–8 cm. long, scarcely 1 mm. thick, their bases somewhat dilated; flowers sessile and solitary or rarely 2 together in the axils of the leaves; sepals about 6 mm. long, pale green; petals yellow; stamens about as long as the calyx; capsule linear, 2–3 cm. long, at length splitting into 3 linear valves.

At lower elevations in dry districts, Porto Rico; St. Thomas, St. Jan, St. Croix:—Florida; Bahamas; Jamaica; Cuba; Hispaniola; St. Martin; Antigua to Trinidad; continental tropical America, south to Argentina. BARBAS DE UCAR. SPANISH MOSS. OLD MAN'S BEARD.

9. **TILLANDSIA** L. Sp. Pl. 286. 1753.

Epiphytic plants with narrow entire leaves and white, yellow or purple flowers. Sepals distinct and separate or very nearly so. Petals distinct. Stamens hypogynous or the three inner ones inserted on the bases of the petals; filaments filiform; anthers linear or linear-oblong. Ovary superior; style subulate; stigmas short. Capsule septicidally 3-valved. Seeds erect, narrow, supported on a long funiculus which splits up into fine threads. [Dedicated to Elias Tillands, 1640–1693, Swedish botanist.] About 350 species, natives of warm and tropical America, known as WILD PINES or PINON. Type species: *Tillandsia utriculata* L.

1. Flowering stems leafy, their leaves smaller than the basal ones; stamens longer than the petals.
 - a. Branches of the inflorescence loosely flowered.
 - Flowers appressed.
 - Flowers widely spreading.
 - b. Branches of the inflorescence densely flowered.
 - Leaves filiform.
 - Inflorescence mostly not longer than the leaves; bractlets silvery-lepidoite; spikes few.
 - Inflorescence usually longer than the leaves; bractlets nearly glabrous; spikes several.
 - Leaves flat or subterete, elongated, not filiform.
 - Bractlets stiff, rigid.
 - Inflorescence-branches subdigitate.
 - Inflorescence-branches pinnate.
 - Sepals shorter than the linear bractlets.
 - Sepals as long as the bractlets or longer.
 - Bractlets membranous or coriaceous.
 - Plants without bulb-like bases; leaves gradually tapering from the base.
 - Plants with distinct bulb-like bases; leaves abruptly enlarged at the base.
 2. Flowering stems scape-like; basal leaves setaceous-filiform; stamens shorter than the petals.
1. *T. utriculata*.
 2. *T. aloifolia*.
 3. *T. tenuifolia*.
 4. *T. festuoides*.
 5. *T. fasciculata*.
 6. *T. lineatispica*.
 7. *T. polystachya*.
 8. *T. sublara*.
 9. *T. bulbosa*.
 10. *T. recurvata*.

1. ***Tillandsia utriculata*** L. Sp. Pl. 286. 1753.

Tillandsia ramosa Sweet, Hort. Brit. 425. 1827.

Tillandsia Sintenisii Baker, Journ. Bot. 26: 42. 1888.

Plants solitary or clustered on trees or shrubs, large, sometimes 4 m. high. Basal leaves numerous, densely appressed-scaly, 3-7 dm. long, lanceolate-attenuate with bases gradually expanded, and 5-10 cm. wide, the lower ones of the flowering stem similar, but smaller, the upper reduced to acute sheathing scales 2-4 cm. long; inflorescence usually much branched, the branches long, ascending or nearly erect; spikes few-flowered; bractlets oblong, appressed, 1.5-3 cm. long; sepals oblong, 2-2.5 cm. long; petals white or nearly white, shorter than the stamens; capsules subcylindric, 4-5 cm. long.

On trees, Porto Rico, in dry and moist districts; St. Thomas, St. Croix.—Florida; West Indies; continental tropical America.

2. ***Tillandsia aloifolia*** Hook. Exotic Fl. 3: pl. 205. 1826.

Tillandsia flexuosa Lindl. Bot. Reg. pl. 749. 1823. Not Sw. 1788.

Plants usually solitary on trees or shrubs, 3-10 dm. long, the flowering stem much longer than the densely appressed-scurfy leaves. Lowest leaves ovate, acute, 8 cm. long or less, the next lanceolate, attenuate-acuminate, 10-20 cm. long, 3-5 cm. wide near the base, those of the stem sheathing, acute, 2-5 cm. long; inflorescence paniculate; bractlets linear-lanceolate, concave, spreading, 2-3 cm. long; sepals oblong, 2-2.5 cm. long; petals white to purple, about 2 cm. long; stamens longer than the petals; capsule cylindric, pointed, about twice as long as the bractlets.

On bushes, Santurce, Porto Rico.—Florida, Bahamas; Cuba; Jamaica; Hispaniola to Trinidad and Curacao; continental tropical America.

3. ***Tillandsia tenuifolia*** L. Sp. Pl. ed 2, 410. 1762.

Tillandsia setacea Sw. Fl. Ind. Occ. 1: 593. 1797.

Plants usually tufted on trees; leaves numerous, filiform-setaceous with a broader base, rather stiff, 1-2 dm. long, grayish green and glabrate above, brownish lepidoite toward the base; scape slender, erect, usually not longer than the lower leaves, its sheaths bearing filiform-setaceous blades; inflorescence stout, usually of 3-6, few-flowered spikes; bractlets coriaceous, concave, acute, silvery-lepidoite on the back, somewhat longer than the sepals; sepals coriaceous, 10-12 mm. long; petals nearly 3 cm. long; capsule cylindric, acute, about 2 cm. long; coma of the seeds white, about 15 mm. long.

On trees in forests and plantations, Porto Rico.—Florida; Jamaica; Cuba; Hispaniola; continental tropical America.

4. *Tillandsia festucoides* Brongn.; Mez, in DC. Mon. Phan. 9: 678. 1896.

Similar to *T. tenuifolia*, but larger, the numerous leaves up to 5 dm. long, filiform-setaceous with a broad base, brownish-lepidote below. Scape slender, often drooping, usually as long as the lower leaves or longer, its sheaths with filiform-setaceous blades; inflorescence of several or many, several-flowered spikes 3-4 cm. long; bractlets coriaceous, ovate-lanceolate, concave, acute, longer than the sepals, glabrous or sparingly lepidote on the back; sepals about 17 mm. long; petals about 4 cm. long; capsule 2-2.5 cm. long, fusiform-cylindric, pointed; coma of the seeds white, about 17 mm. long.

On trees especially in mountain forests, Porto Rico:—Florida; Cuba; Hispaniola; Jamaica.

5. *Tillandsia fasciculata* Sw. Prodr. 56. 1788.

Vriesia glaucophylla Hook. Bot. Mag. pl. 4415. 1848.

T. fasciculata venosispica Mez, in DC. Mon. Phan. 9: 683. 1896.

Plants usually clustered on trees, the flowering stems stout, 2-6 dm. long. Leaves densely appressed-scurfy, lanceolate-attenuate, their bases 5 cm. wide or less, the lower ones often as long as the flowering stems, the upper smaller; spikes subdigitate, compressed, 5-15 cm. long, 1-3 cm. wide, acute, many-flowered; bractlets oblong, acute, appressed, rigid, 2-3 cm. long, red or reddish; sepals lanceolate, about as long as the bractlets; petals blue, nearly twice as long as the sepals; capsules as long as the bractlets or somewhat longer, long-pointed; coma of the seeds white, about 17 mm. long.

On trees in woodlands and forests, Porto Rico; Vieques; St. Thomas; St. Jan:—Florida; West Indies; continental tropical America. A Porto Rico specimen was erroneously referred by Baker to *T. anceps* Lodd.

6. *Tillandsia lineatispica* Mez, in DC. Mon. Phan. 9: 699. 1896.

Leaves linear above a dilated base, densely lepidote below, about 6 dm. long, 2.5 cm. wide with long, rather stiff, thick, filiform incurved tips. Scape 1.3 m. high, stout, erect, glabrous, its sheaths with blades smaller; inflorescence compact, about 3 dm. long, surpassing the leaves, paniculate; spikes erect, about 1.5 dm. long, 10 mm. wide, linear, the lower sometimes digitately branched; bracts red, lepidote, erect, long-acuminate; bractlets marginally and apically violet-purple, coriaceous, carinate, ovate-elliptic, acute, about 2.7 cm. long, prominently lineate; sepals glabrous, lineate, about 2 cm. long; petals longer than the sepals.

On rocks, St. Jan (*Eggers 3104*, according to Mez). Endemic. This is presumably the undetermined species recorded by Eggers as growing at Adrian, St. Jan.

7. *Tillandsia polystachya* L. Sp. Pl. ed. 2, 410. 1762.

Renealmia polystachya L. Sp. Pl. 286. 1753.

Tillandsia angustifolia Sw. Prodr. 57. 1788.

Plants solitary or clustered on trees or shrubs, the flowering stem 2.5-4 dm. or more tall. Leaves linear or linear filiform, and often recurving above the dilated bases, the lower ones shorter than the flowering stem; spikes erect, 5-25 cm. or more long, many-flowered; bractlets ovate-oblong, erect or appressed, rigid; sepals leathery, elliptic or linear-elliptic, 14-15 mm. long; petals blue, nearly twice as long as the sepals; capsules cylindric-prismatic, 2.5-3.4 cm. long, acute.

On trees in woodlands and forests, Porto Rico:—Florida; Jamaica; Cuba; Hispaniola; Guadeloupe to St. Vincent; continental tropical America.

8. *Tillandsia sublaxa* Baker, Journ. Bot. 25: 280. 1887.

Plants solitary or clustered; leaves lanceolate, lepidote, 12–25 cm. long gradually tapering from the broadened base. Flowering stem as long as or longer than the leaves; spike unbranched, compressed, 4–14 cm. long; bracteoles subcoriaceous, oblong-lanceolate, 1.5–2 cm. long; sepals oblong, obtuse; petals lilac, much longer than the sepals; capsule 2–2.5 cm. long; seeds 2.5 mm. long, their coma white, 1.5 cm. long.

On trees or shrubs in forests, Porto Rico; Vieques:—Florida; Cuba; Jamaica; Hispaniola.

9. *Tillandsia bulbosa* Hook. Exot. Fl. 3: pl. 173. 1826.

Bases of the lower leaves bulbous-imbriated, suborbicular, 4–5 cm. broad, abruptly narrowed into a narrowly linear, subterete-involute blade 7–25 cm. long, appressed lepidote, spreading, the upper leaves with similar erect blades, but with narrow clasping bases. Scape shorter than the leaves or about equalling them; spikes 1–6, often 2, digitate, compressed, rather densely flowered, 4–7 cm. long, subtended by leaf-like bracts; bracteoles ovate-lanceolate, conduplicate, 1–1.5 cm. long, usually red; sepals oval, about 12 mm. long; petals about 2.5 cm. long; capsule cylindrical, 3–4 cm. long; seeds 3 mm. long, their coma white, 2–2.5 cm. long.

On a tree, Mayaguez, 1913 (W. E. Hess, 588):—Jamaica, Cuba; Martinique; Tobago; Trinidad; continental tropical America.

10. *Tillandsia recurvata* L. Sp. Pl. ed. 2, 410. 1762.

Rencalmia recurvata L. Sp. Pl. 287. 1753.

Stems clustered on the branches of trees or shrubs, sometimes on other objects, even on telegraph wires, often forming large masses, the leaf-bearing part 3–8 cm. long, terminated by a scape-like, 1–5-flowered (mostly 2-flowered) very slender peduncle 5–12 cm. long. Leaves filiform-setaceous, about as long as the peduncle or shorter, densely covered with soft, spreading scales, their bases a little dilated; bracts lanceolate, 1–1.5 cm. long; sepals lanceolate, acute, shorter than the bracts; petals blue, narrow, about as long as the bracts; capsule linear, prismatic, 2–2.5 cm. long.

On trees, shrubs and telegraph wires at lower and middle elevations, Porto Rico; St. Thomas, St. Jan, St. Croix:—West Indies, south to Martinique; Florida and Texas; tropical continental America. NIDOS DE GUNGULEN.

Tillandsia canescens Sw., recorded by Krebs from St. Thomas, is an error in determination.

10. **NEOVRIESIA** Britton.

[*VRIESIA* Lindl. Bot. Reg. 1843: pl. 10. 1843. Not Hassk. 1842.]

Large, epiphytic Bromeliads, the leaves mostly tufted, lepidote at least beneath, the scapose inflorescence subpicate or paniculate, the perfect flowers often distichous. Sepals distinct, convolute, mostly obtuse. Petals distinct, convolute, ligulate, the ligules mostly emarginate. Stamens in 2 series; anthers elongated, dorsifixed. Ovary superior or partly inferior; style elongated. Capsule septically dehiscent. Seeds many, fusiform, comose. [Commemorates W. H. de Vries, Professor of Botany in Amsterdam.] About 90 species, natives of tropical America. Type species: *Tillandsia pittacina* Hook.

1. *Neovriesia macrostachya* (Bello) Britton

Caraguata macrostachya Bello, Ann. Soc. Esp. Hist. Nat. 12: 122. 1883.
Vriesea macrostachya Mez, in DC. Mon. Phan. 9: 601. 1896.

Leaves thin, flexible, linear above a somewhat broader base, 5.5–7.5 dm. long, 5–8 cm. broad, often somewhat rounded and acute at the apex, glabrous above, minutely lepidote beneath; flowering stem 4.5–8 dm. or more tall; peduncle stout, stiffly erect; bract-leaves appressed, imbricated; spike simple, 7.5–9 cm. broad; flower-bracts ovate-triangular, 3–5 cm. long; sepals elliptic, 2.6–3 cm. long, obtuse; petals broadly lingulate; capsule-valves 4–5 cm. long, 1.5–1.6 cm. broad.

On trees in mountain forests, Porto Rico.—Cuba; Jamaica; South America. PIRIGALLO.

10. *GUZMANIA* R. & P. Fl. Per. 3: 37. 1802.

Epiphytic herbs with the basal leaves usually less attenuate than in species of *Tillandsia*, the sides above the dilated bases nearly parallel up to the abruptly narrowed apex. Inflorescence simple; flowers solitary in the axils of bracts; sepals oblong, shortly connate at the base; corolla gamopetalous, the segments shorter than the cylindrical tube; stamens inserted at the throat of the corolla-tube; anthers linear-oblong, united in a ring around the style by their edges; ovary 3-celled; style elongated; stigma short; capsule and seeds similar to *Tillandsia*. [Named in honor of Anastasio Guzman, a Spanish naturalist.] About 20 species or more, natives of tropical America. Type species: *Guzmania tricolor* R. & P.

Inflorescence short, corymbiform.

1. *G. lingulata*.

Inflorescence elongated, spicate.

Upper bracts of the inflorescence subtending barren flowers or without flowers.

Bracts much shorter than the flowers; corolla yellow, 5–6 cm. long.

2. *G. Berteroniana*.

Bracts about as long as the flowers; corolla white, about 3 cm. long.

3. *G. monastachya*.

All bracts subtending fertile flowers.

4. *G. erythrolepis*.

1. *Guzmania lingulata* (L.) Mez, in DC. Mon. Phan. 9: 899. 1896.

Tillandsia lingulata L. Sp. Pl. 286. 1753.

Caraguata lingulata Lindl. Bot. Reg. under pl. 1068. 1827.

Lower leaves nearly linear above a broader, lepidote base, 3–5 dm. long, the apex acuminate, the upper ones much shorter, forming a cup-shaped involucre. Scape stout, usually not longer than the involucre-leaves; inflorescence dense, several-many-flowered, corymbiform; bracts linear, usually red, longer than the sepals; sepals linear, 15–18 mm. long; petals white, linear, connate, rounded and hooded at the apex; capsule oblong, short-beaked, about 3 cm. long; coma of the seeds red-brown.

On trees in mountain forests, Porto Rico; Tortola.—Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America.

2. *Guzmania Berteroniana* (R. & S.) Mez, in DC. Mon. Phan. 9: 904. 1896.

Caraguata Berteroniana R. & S. Syst. 7: 1229. 1830.

Tillandsia Caraguata Dietr. Syn. 2: 1059. 1840.

Caraguata grandiflora Baker, Brom. 145. 1889.

Leaves linear above a slightly broader base, rosulate, 3–4 dm. long, 4–5 cm. wide, densely and minutely lepidote-punctate toward the base, otherwise glabrous, the apex acute or acuminate. Scape much shorter than the leaves, stout;

inflorescence a simple dense spike 2-3 dm. long; bracts scarlet, cuspidate, the lower acuminate or acute, subtending flowers, the uppermost lanceolate, acute, barren; sepals 2 cm. long, broadly elliptic, rounded; petals yellow, 5-6 cm. long, coherent above into a tube; capsule pointed, about 3 cm. long; coma of the seeds white.

On trees and banks in mountain forests, Porto Rico. Endemic.

3. **Guzmania monostachya** (L.) Rusby; Mez in DC. Mon. Phan. 9: 905. 1896.

Renealmia monostachya L. Sp. Pl. 287. 1753.

Tillandsia monostachya L. Sp. Pl. ed. 2, 410. 1762.

Guzmania tricolor R. & P. Fl. Per. 3: 38. 1802.

Leaves linear above a somewhat broadened base, densely rosulate, 2-4 dm. long, 1.5-2.5 cm. wide, minutely lepidote-punctate, or becoming lepidote in age, the apex acuminate. Scape rather stout, much shorter than the leaves; inflorescence a simple rather dense spike about as long as the scape, shorter than the leaves; bracts pale green, sometimes brownish-veined, broadly ovate, acuminate or acute, the lower subtending perfect flowers, the upper barren; sepals obovate, nearly 2 cm. long, connate below; petals about 3 cm. long, white, partly coherent into a tube, their apices rounded; capsule 2-2.5 cm. long; coma of seeds white.

On trees in coffee plantations and in forests, Porto Rico:—Jamaica; Cuba; Hispaniola; Tobago; Trinidad; Florida and continental tropical America.

4. **Guzmania erythrolepis** Brongn.; Planch. Fl. Serres II. 1: 25, pl. 1089. 1856.

Leaves nearly or quite lepidote when mature, linear above an oval base, 4 dm. long or less, 3-4 cm. wide, the apex acute or acuminate. Scape short and stout; inflorescence a dense many-flowered spike 1-3 dm. long; bracts scarlet, membranous, broadly ovate, the lower acuminate or acute, the upper acute, obtuse or rounded, all subtending perfect flowers; sepals about 2 cm. long, elliptic rounded; petals 3.5-4 cm. long, connate, white.

Forest on Monte Alegre:—Jamaica; Cuba.

11. **THECOPHYLLUM** E. Andre, Bromel. Andreanae 107. 1889.

Acaulescent epiphytic herbs resembling species of *Guzmania*. Inflorescence mostly paniculate, with 2 or more flowers in the axils of the bracts; sepals erect, imbricated, shortly connate at the base; corolla gamopetalous; stamens inserted at the throat of the corolla-tube; filaments short; anthers free; ovary 3-celled; style long; stigmas linear; capsule oblong-trigonal, septically deliscent; seeds numerous. [Greek, pouch-leaf.] About 12 species, natives of tropical America. Type species, *Thecophyllum Willmackii* E. Andre.

1. **Thecophyllum Sintenisii** (Baker) Mez, Bull. Herb. Boiss. II. 3: 131. 1903.

Caraguata Sintenisii Baker, Brom. 145. 1889.

Guzmania Sintenisii Mez, in DC. Mon. Phan. 9: 920. 1896.

Leaves oblong-lanceolate, 2-3 dm. long, 3-4 cm. broad, lepidote-punctate; flowering stem 4-6 dm. long; bract-leaves large, lanceolate; inflorescence lax; bracts ovate, bright red, 4-9 cm. long; flowers sessile, usually 2 in the axils of each bract; sepals oblong, 2-2.5 cm. long, obtuse; corolla-tube cylindric, the lobes oblong; capsule valves 2.5-3 cm. long.

On trees in mountain woodlands, Porto Rico:—Jamaica; Cuba.

Dyckia sulphurea K. Koch, Argentinian, established by Mr. Arthur S. Fairchild at Louisenhøj, St. Thomas, has stiff lanceolate spine-tipped leaves 10-12 cm. long in a dense rosette, the racemose inflorescence 4-6 dm. tall, the sulphur-yellow flowers about 1.5 cm. long.

Family 3. **COMMELINACEAE** Reichenb.

SPIDERWORT FAMILY.

Perennial or annual succulent herbs, with regular or irregular perfect and often showy flowers in cymes or umbels, commonly subtended by spathe-like or leafy bracts. Perianth of 2 series; a calyx of mostly 3 persistent sepals and a corolla of mostly 3 membranous and deciduous or fugacious petals. Stamens mostly 6, usually hypogynous, rarely fewer, all similar and perfect or 2 or 3 of them different from the others and sterile; filaments filiform or somewhat flattened; anthers 2-celled, mostly longitudinally dehiscent. Ovary superior, 2- or 3-celled; ovules solitary or several in each cell, orthotropous; style simple; stigmas terminal, entire or obscurely 2- or 3-lobed. Seeds solitary or several in each cell of the capsule. Capsule 2- or 3-celled, loculicidally 2- or 3-valved, or the fruit indehiscent. Embryo small. Endosperm copious. About 25 genera and 350 species, mostly natives of tropical regions, a few in the temperate zones.

Fruit indehiscent.

Capsule loculicidally 2- or 3-valved.

Fertile stamens 2 or 3, with 1-4 sterile ones.

Stamens 1-6, all fertile.

Stamens 5 or 6.

Petals distinct or nearly so.

Ovary-cavities 2-ovuled.

Peduncles exerted from the mouths of the leaf-sheaths; sepals herbaceous.

Peduncles perforating the bases of the leaf-sheaths; sepals fleshy in fruit.

Ovary-cavities 1-ovuled.

Petals partly united into a tube.

Stamens 1-3.

1. *Athyrocarpus*.

2. *Commelina*.

3. *Tradescantia*.

4. *Campelia*.

5. *Rhoco*.

6. *Zebrina*.

7. *Callisia*.

1. **ATHYROCARPUS** Schlecht. *Linnaea* 26: 454. 1853.

Branching herbs with creeping stems, the few-flowered inflorescence subtended by spathe-like bracts. Sepals 3, persistent, the exterior one boat-like, the two interior ones flat or somewhat concave. Petals 3, the exterior one equilateral, the two interior ones inequilateral. Fertile stamens 3, the filaments filiform, the anthers oblong; sterile stamens 2 or 3, the anthers hastate-triangular. Ovary 3-celled, the anterior cells 2-ovuled, the posterior cell 1-ovuled. Fruit indehiscent, 5-seeded. [Greek, referring to the valveless fruit.] About 4 species, natives of tropical America. Type species: *Commelina pallida* Willd.

1. **Athyrocarpus persicariaefolius** (DC.) Hemsl. *Biol. Centr. Am. Bot.* 3: 386. 1885.

Commelina persicariaefolia DC. in Redoute *Lil.* 8: pl. 472. 1816.

Phaeospherion persicariaefolium C. B. Clarke in DC. *Mon. Phan.* 3: 137. 1881.

Tradescantia portoricensis Bello, *Anal. Soc. Esp. Hist. Nat.* 12: 122. 1883.

Stems branching, prostrate or ascending, rooting at the lower nodes. Leaves lanceolate, 6-12 cm. long, 1.5-3.9 cm. broad, acuminate at the apex, inequilateral at the base, glabrous, the sheaths closed, often more or less rusty-ciliate; peduncles short; spathes conduplicate, the valves semi-orbicular, 2-2.5 cm. long; interior

sepals 5 mm. long, 2-3 mm. broad; interior petals clawed; fruit ellipsoid or subglobose, 5.5-6 mm. long, 4.5-5 mm. broad, crustaceous, grayish-white, shining; anterior cells of the capsule 2-seeded, the seeds superposed, truncate, the posterior cell with 1 large seed.

Woods, in wet or moist districts, Porto Rico, ascending to middle or higher elevations:—Cuba (according to Clarke), Grenada; Trinidad; Central America; northern South America. COJITE BLANCO.

2. **COMMELINA** [Plumier] L. Sp. Pl. 40. 1753.

Somewhat succulent, perennial or annual, branching herbs, with sessile or short-petioled leaves, and irregular mostly blue flowers in cymes subtended by spathe-like bracts. Sepals 3, unequal, the larger ones sometimes slightly united. Petals unequal, 2 of them larger than the third. Perfect stamens 3, rarely 2, one of them incurved and its anther commonly larger. Sterile stamens usually 3, smaller than the fertile. Filaments glabrous. Capsule 3-celled. Seeds 1 or 2 in each cavity, the testa roughened, smooth or reticulated. [Dedicated to Kaspar Commelin, 1667-1731, Dutch botanist.] About 90 species of wide distribution in warm and temperate regions known as COJITE, FRENCH-WEED and DAY-FLOWER. Type species: *Commelina communis* L.

Spathes not united at the base.
Spathes united at the base.

1. *C. longicaulis*.
2. *C. elegans*.

1. **Commelina longicaulis** Jacq. Coll. 3: 234. 1789.

Commelina gracilis R. & P. Fl. Per. 1: 44. 1798.

Commelina cayennensis L. C. Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Glabrous or very nearly so; stems procumbent or creeping, 3-8 dm. long. Leaves lanceolate or ovate-lanceolate, 2.5-8 cm. long, acute or acuminate at the apex, the sheaths usually ciliate on the margin; spathes acute to acuminate, 1-2.5 cm. long, not united at the base; petals blue, the anterior slightly smaller; ventral cavities of the ovary 2-ovuled, the dorsal 1-ovuled; capsule commonly 5-seeded (2 seeds in each of the ventral cells, 1 in the dorsal); seeds oblong, 2-3 mm. long, reticulated. [*Commelina nudiflora* of authors, not of Linnaeus; *C. communis* of Krebs, not of Linnaeus.]

Fields, banks, woods and cultivated and waste grounds, Porto Rico, ascending to higher elevations; Culebra; Vieques; St. Thomas; St. Jan; St. Croix:—Florida; Bermuda; West Indies; continental tropical America and Old World tropics.

2. **Commelina elegans** H. B. K. Nov. Gen. 1: 259. 1816.

Stems branching at the base, the branches decumbent, rooting at the lower nodes. Leaves lanceolate to elliptic or oblong-lanceolate, 4-10 cm. long, acute or acuminate at the apex, rounded or acutish at the base, the sheaths often sparingly ciliate on the margin; spathes acute, 1.5-2 cm. long, united at the base, pubescent, or sometimes glabrous; petals blue or pale bluish-white; capsule 4-5 mm. long; seeds 3, ellipsoid, slightly flattened, 3-3.5 mm. long, smooth. [*C. virginica* of authors, not of Linnaeus.]

Banks, fields and woods at lower and middle elevations. Porto Rico: Desocheo; Mona; Vieques; St. Thomas; Tortola; Anegada; St. Croix:—Southeastern United States; Bermuda, West Indies; continental tropical America.

3. **TRADESCANTIA** L. Sp. Pl. 288. 1753.

Perennial herbs, with simple or branched stems and showy or sometimes inconspicuous regular flowers in terminal or terminal and axillary umbel-like cymes

subtended by leaf-like or scarious bracts. Sepals 3, herbaceous. Petals 3, sessile. Stamens 6, all alike and fertile, or those opposite the petals shorter; filaments bearded or glabrous. Ovary 3-celled, the cells 2-ovuled. Capsule 3-celled, loculicidally 3-valved, 3-12-seeded. [In honor of John Tradescant, gardener of Charles I, died 1638.] About 35 species, natives of tropical and temperate America. Type species: *Tradescantia virginiana* L.

Pedicels 0.7-2 cm. long; filaments equal or nearly so.
Pedicels 0-3 mm. long; filaments unequal.

1. *T. geniculata*.
2. *T. elongata*.

1. *Tradescantia geniculata* Jacq. Enum. 18. 1760.

Stems more or less diffusely branched, the branches spreading. Leaves lanceolate to ovate, 3-14 cm. long, 1.5-4.2 cm. broad, acute to long-acuminate at the apex, rounded and occasionally somewhat cordate at the base, glabrous or sparingly villous on both surfaces, the sheaths ciliate; umbels few-flowered, cymose or paniculate; pedicels slender, 0.7-2 cm. long; sepals lanceolate, 2.5-3.2 mm. long, 1-1.3 mm. broad, acute, glabrous or slightly pilose; petals white; filaments equal or nearly so, villous, the anthers all alike; capsule 2-3 mm. long; seeds obscurely rugose, 1 mm. long, gray.

Woods, ravines and thickets in wet or moist districts, Porto Rico, ascending to higher elevations in the mountains; Vieques:—Hispaniola; Antigua and Dominica to Trinidad; continental tropical America; recorded from the Sandwich Islands.

2. *Tradescantia elongata* G. F. W. Meyer, Fl. Esseq. 146. 1818.

Tradescantia Balbisi Kunth., Enum. 4: 97. 1843.

Stems slender, creeping, 3-6 dm. long. Leaves lanceolate to lanceolate-ovate, 3-8 cm. long, 1.5-2.3 cm. broad, acute or acuminate at the apex, narrowed or rounded at the base, usually glabrous beneath, the sheaths ciliate; umbels contracted; flowers subsessile or with pedicels up to 3 mm. long; sepals elliptic, 3-3.5 mm. long, 2-2.5 mm. broad, obtuse; petals pink; filaments unequal, villous, the anthers of the two sets dissimilar; capsule 3 mm. long; seeds 1.2-1.4 mm. broad, gray, the surface pitted.

Stream-banks and shaded limestone rocks in the northern and central districts of Porto Rico:—Guadeloupe; Dominica; Martinique; St. Vincent; Mexico to Argentina.

4. *CAMPHELIA* L. C. Rich. Anal. Fruit. 46. 1808.

Robust herbs with leafy stems, the small white flowers in contracted umbels, subtended by leafy bracts, the long axillary peduncles perforating the bases of the large tube-like leaf-sheaths. Sepals 3, fleshy in fruit. Petals 3, persistent. Stamens 6. Ovary 3-celled, the cells 2-ovuled. Capsule 3-valved, included within the calyx. Seeds 1 or 2 in each cavity. [Greek, bending.] A monotypic genus.

1. *Campelia Zanonia* (L.) H. B. K. Nov. Gen. 1: 264. 1816.

Commelina Zanonia L. Sp. Pl. 41. 1753.

Tradescantia Zanonia Sw. Prodr. 57. 1788.

Stems 5-12 dm. long, erect or ascending. Leaves oblong lanceolate to broadly lanceolate, 12-25 cm. long, 3-7 cm. broad, long-acuminate at the apex, tapering at the base, glabrous or somewhat sparingly pilose above, pilose or occasionally glabrous beneath, the sheaths hirsute; peduncles 7-18 cm. long; involueral bracts lanceolate to ovate, acuminate at the apex, subcordate at the base; pedicels 0-6 mm. long; sepals elliptic to oval, 4.5-5 mm. long, 2.5-3.5 mm. broad, obtuse or acutish at the apex; petals white; capsule 3-5 mm. long; seeds ellipsoid or orbicular, somewhat compressed, 2 mm. long, grayish-brown.

Woods and shaded banks in wet or moist parts of the central districts of Porto Rico, ascending to higher elevations:—Cuba; Hispaniola; Jamaica; continental tropical America, COJITE BLANCO,

5. **RHOEO** Hance; Walp. Ann. 3: 659. 1852.

A somewhat fleshy, short-stemmed, low herb, glabrous throughout or the mouth of the leaf-sheaths pilose, the leaves much longer than the large-bracted inflorescence, the axillary peduncles simple or forked, the umbelled flowers almost concealed within the bracts. Sepals 3, petal-like, distinct. Petals 3. Stamens 6, nearly equal; filaments pilose. Ovary 3-celled, sessile; ovules solitary in each cavity. Fruit a loculicidally 3-valved capsule. Seeds rugose, ellipsoid. [Name unexplained.] A monotypic genus.

1. **Rhoeo discolor** (L'Her.) Hance; Walp. Ann. 3: 660. 1852.

Tradescantia discolor L'Her. Sert. Angl. 8. 1788.

Stems stout, 0.7-2 dm. high, about 1.5 cm. thick, often clustered and sometimes forming large colonies. Leaves few, nearly erect, oblong-lanceolate, 2-3.5 dm. long, 3.5 cm. wide, acuminate, dark-green above, purple beneath, rather fleshy; peduncles 2-4 cm. long; bracts compressed-conduplicate, broader than high, 2-3 cm. high, acute; umbel many-flowered; pedicels about 1 cm. long; petals white, 5-8 mm. long; capsule ovoid, obtuse, 3-angled, 4-4.5 mm. long; seeds 3-4 mm. long. [*Tradescantia bicolor* of Bello, not of Kunth.]

Walls and rocky woods at lower elevations, Porto Rico, much planted in gardens; St. Thomas; St. Jan; St. Croix;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe to Barbados; recorded from Mexico. Recorded by Bello as *Tradescantia bicolor* "Sw." SANGRIA. SANGUINARIA. OYSTER PLANT.

6. **ZEBRINA** Schnizl, Bot. Zeit. 7: 870. 1849.

Trailing perennial herbs, with showy variegated leaves, the small pinkish flowers scarcely exerted from the unequal bracts. Calyx 3-parted. Corolla tubular, 3-lobed. Stamens 6, all perfect, the filaments adnate to the corolla-tube. Ovary 3-celled; ovules 1 or 2 in each cell. Capsule loculicidally dehiscent. [From Zebra, a word of African origin.] A monotypic genus of warm temperate and tropical America.

1. **Zebrina pendula** Schnizl, Bot. Zeit. 7: 870. 1849.

Cyanotis vittata Lindl. Journ. Hort. Soc. 5: 139. 1850.

Leaves ovate, 3-7 cm. long, 1.5-3.2 cm. broad, acute or acuminate at the apex, inequilaterally rounded at the base, the upper surface silvery-green or silvery-white, the central part and margin purple-striped, the lower surface red-purple; sheaths villous; calyx-lobes oblong-lanceolate to lanceolate, 5 mm. long, 1.5 mm. broad; corolla-tube 6 mm. long, the lobes ovate, 4.5-5 mm. long, 2.7-3 mm. broad; ovary glabrous.

Mountain woods, slopes and banks, Porto Rico, at middle and higher elevations in wet or moist districts; St. Thomas; St. Croix;—Florida; Jamaica; Cuba; Hispaniola; Saba; Montserrat; Barbados; Mexico; Central America. Naturalized in Bermuda. WANDERING JEW.

7. **CALLISIA** Loefl.; L. Sp. Pl. ed. 2. 62. 1762.

Creeping or ascending, often delicate, herbs, the small axillary flowers glomerate, scarcely exerted from the leaf-sheath, or umbellate on filiform exerted peduncles. Sepals 3 or 2, persistent. Petals 3 or 2. Stamens 3 or 2, occasionally 1; filaments glabrous. Ovary 2- or 3-celled, compressed or somewhat angled; stigma penicillate or 3-lobed; ovules 2 in each cell. Capsule membranous, 2- or 3-valved. [Greek, beauty.] About 4 species, natives of tropical America. Type species: *Callisia repens* L.

Flowers glomerate, scarcely exerted from the leaf-sheaths.
Flowers umbellate on filiform exerted peduncles.

1. *C. repens*.
2. *C. monandra*.

1. *Callisia repens* L. Sp. Pl. ed. 2. 62. 1762.

Stems slender, glabrous. Leaves cordate-ovate, 1.5–3.5 cm. long, 0.6–1.3 cm. broad, acuminate at the apex, clasping at the base, the margin ciliate, sometimes purplish; flowers glomerate, scarcely exerted from the leaf-sheaths; sepals oblong-linear to linear-lanceolate, 3–4 mm. long, 0.7–0.9 mm. broad, pilose on the back; petals 3, oblong, shorter than the sepals; ovary oblong-ellipsoid, pilose at the apex; style filiform, glabrous; stigma penicillate; capsule oblong, 1.5 mm. long, compressed; seeds 1 mm. long, 0.8–0.9 mm. broad, dark-brown, wrinkled.

On rocks and in gravelly soil, Porto Rico, at lower and middle elevations in dry parts of the southern districts; Mona; Culebra; Vieques; St. Thomas; St. Jan; Tortola; St. Croix;—Jamaica; Cuba to Trinidad; continental tropical America.

2. *Callisia monandra* (Sw.) Schultes in R. & S. Syst. 7: 1179. 1830.

Tradescantia monandra Sw. Prodr. 57. 1788.

Callisia umbellulata Lam. Ill. 1: 130. 1791.

Stems weak, usually glandular-pilose above. Leaves ovate, 2–4 cm. long, 1–2 cm. broad, acuminate at the apex, rounded at the base, sessile or nearly so, the margin ciliate; flowers umbellate, the filiform peduncles 1–3 cm. long, long-exserted from the leaf-sheaths; sepals elliptic-oblong, 1.6–2 mm. long, 0.9–1 mm. broad, concave, glandular-pilose or glabrous on the back; petals lanceolate; ovary oblong-ellipsoid, compressed or somewhat angled, glabrous or slightly pilose at the apex; style shorter than the capsule; stigma 3-lobed; capsule 1–1.3 mm. long; seeds 0.6–0.8 mm. broad, brownish white, finely striate. [*C. repens* of Bello, not of Linnaeus.]

Woods, banks, rocks and in cultivated grounds in moist or wet districts, Porto Rico, ascending to higher elevations; St. Thomas (according to Eggers);—Cuba; Hispaniola; Guadeloupe; Martinique; continental tropical America. COJITE MORADO.

Family 4. **PONTEDERIACEAE** Dum.

PICKEREL-WEED FAMILY.

Perennial, aquatic or bog plants. Leaves often clustered, sometimes mainly basal, the blades broad or grass-like. Flowers perfect, more or less irregular, solitary or in spikes subtended by leaf-like spathes. Perianth free from the ovary, corolla-like, 6-parted. Stamens 3 or 6, inserted on the tube or the base of the perianth; filaments filiform, or dilated at the base, or thickened about the middle; anthers 2-celled. Ovary 3-celled with axile placentae, or 1-celled by suppression; style filiform or columnar; stigma terminal, entire or minutely toothed; ovules anatropous, numerous, sometimes only 1 of them perfecting. Fruit a many-seeded capsule, or a 1-celled, 1-seeded utricle. Endosperm mealy, copious; embryo central, cylindric. About 5 genera and 25 species, in temperate and tropical regions.

1. **PIAROPUS** Raf. Fl. Tell. 2: 81. 1837.

Herbs, often with floating rootstocks. Leaves with stout or slender sometimes inflated petioles and broad blades, or of two kinds, the submerged ones narrow and grass-like. Flowers solitary, or in terminal spikes, racemes or panicles. Perianth showy, its 6 parts in 2 series, united into a tube below, the limb oblique. Stamens 6, irregularly adnate to the perianth, 3 included, 3 exerted; filaments sometimes flattened at the base. Ovary 3-celled; stigma terminal; ovules numerous. Capsule included in the withering-persistent perianth,

loculicidal. [Greek, referring to the swollen petiole of *P. crassipes*.] About 5 species, natives of tropical America. Type species: *Pontederia azurea* Sw.

Leaves in a basal tuft, the petioles often inflated; spathe 2-valved. 1. *P. crassipes*.
Leaves alternate, of two kinds, the submerged grass-like, the 2. *P. diversifolius*.
emersed ovate; spathe 1-valved.

1. ***Piaropus crassipes*** (Mart.) Britton, Ann. N. Y. Acad. Sci. 7: 241. 1893.

Pontederia crassipes Mart. Nov. Gen. 1: 9. 1824.

Piaropus mesomelas Raf. Fl. Tell. 2: 81. 1837.

Eichhornia speciosa Kunth, Enum. 4: 131. 1843.

Eichhornia crassipes Solms; DC. Monogr. Phan. 4: 527. 1883.

Plant floating, or rooting in mud. Leaves in a basal tuft, erect or ascending, glabrous, the stout petioles fusiform-inflated below or sometimes gradually tapering from the base, 0.5–4 dm. long, the leathery blades ovate to orbicular or somewhat reniform, 3.5–16 cm. long, 4–14 cm. broad, faintly many-nerved; scape 1–3.5 dm. long, simple; flowers showy, in a loose spike, the perianth-tube curved, 1.5–2 cm. long, glandular-pubescent, the segments pale violet, obovate to oval, 3.5–4 cm. long, 1.5–2.7 cm. broad, the upper lobe longer than the others and having a patch of blue with an oblong or pear-shaped spotted of bright yellow in the middle. [*Eichhornia azurea* of Bello and of Millspaugh, not of Kunth.]

In ponds and streams, Porto Rico; St. Croix;—Bermuda; Cuba; Jamaica; Hispaniola; Lesser Antilles; Barbados; Florida and continental tropical America; Old World tropics. Occasionally grown for ornament in Porto Rico garden pools. Sometimes forms large masses, impeding navigation. FLOR DE AGUA. WATER HYACINTH.

2. ***Piaropus diversifolius*** (Vahl) P. Wilson.

Heteranthera diversifolia Vahl, Enum. 2: 44. 1806.

Eichhornia pauciflora Seub.; Mart. Fl. Bras. 3: 91. 1847.

Eichhornia natans pauciflora Solms, in DC. Monogr. 4: 526. 1883.

Eichhornia diversifolia Urban, Symb. Aut. 4: 147. 1903.

Stem elongate, slender, floating. Leaves alternate, of two kinds, the emersed leaves with ovate to ovate-oval blades, 1.5–3.5 cm. long, 0.7–3 cm. broad, acute or rounded at the apex, usually cordate at the base, the slender petioles 2–7 cm. long, the submerged leaves with narrow grass-like blades 3–7 cm. long, 2–4 mm. broad; spathes few-flowered; perianth small; ovary ellipsoid, 4 mm. long, 3 mm. broad, the filiform style 1.5 cm. long; seeds cylindrical, brown, 0.8–0.9 mm. long, 0.4 mm. broad, faintly ribbed.

In streams, Porto Rico;—Cuba; Hispaniola; South America.

Order 9. LILIALES.

More or less fleshy herbs, sometimes grass-like or sedge-like, occasionally vines or trees, mostly with well-developed perianth, the flowers usually regular and complete, and their parts in 3's or 6's. Ovary superior or inferior, compound. Fruit various, commonly a capsule or a berry. Endosperm fleshy or horny.

Ovary superior.		
Fruit a capsule; our species fleshy herbs.	Fam. 1.	LILIACEAE.
Fruit a fleshy berry; dioecious vines.	Fam. 2.	SMILACACEAE.
Ovary inferior.		
Stamens 6.		
Fleshy herbs; flowers perfect.	Fam. 3.	AMARYLLIDACEAE.
Twining vines; flowers dioecious.	Fam. 4.	DIOSCOREACEAE.
Stamens 3.		
Stamens opposite the inner corolla-segments.	Fam. 5.	HAEMODORACEAE.
Stamens opposite the outer corolla-segments.	Fam. 6.	IRIDACEAE.

Family 1. **LILIACEAE** Adans.**LILY FAMILY**

Scapose or leafy-stemmed herbs from bulbs or corms, or with rootstocks or a woody caudex, the leaves various. Perianth parted into 6 distinct or nearly distinct segments, or these more or less united into a tube inferior or partly superior. Stamens 6, hypogynous or borne on the perianth or at the bases of its segments; anthers 2-celled. Ovary 3-celled; ovules few or numerous in each cavity, anatropous or amphitropous; styles united; stigma 3-lobed or capitate. Fruit a usually loculicidal capsule, occasionally fleshy and indehiscent. Seeds various, winged or wingless. Embryo in copious endosperm. About 125 genera and 1300 species, widely distributed.

Ovules solitary in each cavity of the ovary; leaves arising from a creeping rootstock.
Ovules numerous in each cavity of the ovary; leaves borne on a short caudex.

1. *Cordyline*.2. *Aloe*.1. **CORDYLINE** Adans. Fam. Pl. 2: 54, 543. 1763.[*SANSEVIERIA* Thunb. Prodr. Fl. Cap. 65. 1794.]

Perennial herbs, with flat or terete coriaceous fibrous leaves in clusters from a creeping rootstock, the greenish-white flowers in a raceme or panicle on a simple scape. Perianth-tube slender, its lobes narrow, spreading. Stamens 6, the filiform filaments inserted at the base of the lobes, the anthers oblong or linear. Ovary 3-celled; ovules solitary in each cavity, erect; style long, filiform; stigma capitate. Fruit with a thin pericarp. Seeds 1-3, subglobose, fleshy. [Greek, a club.] About 50 species, natives of Asia and Africa. Type species: *Aloe hyacinthoides* L. The plants yield valuable fibers.

1. **Cordyline guineensis** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 35. 1918.*Alettris hyacinthoides guineensis* L. Sp. Pl. ed. 2, 456. 1762.*Alettris guineensis* Jacq. Hort. Vind. 1: 36. 1771.*Sansevieria guineensis* Willd. Sp. Pl. 2: 159. 1799.*Acyntia guianensis* Kuntze, Rev. Gen. Pl. 699. 1891.

Leaves lanceolate, nearly flat above the base, 7-14 dm. long, 5-9 cm. wide, narrowed at both ends, dark green and more or less distinctly mottled with white, sometimes bordered with a thin line of red within the white edge. Scape about as long as the leaves; panicle many-flowered; pedicels 5-8 mm. long; perianth greenish-white, its lobes linear or linear-spatulate, about 1.5 cm. long, recurved, about as long as the tube.

Waste grounds and ravines, Porto Rico, spontaneous after cultivation; Vieques; St. Thomas; St. Croix:—Florida; Bahamas; Cuba; Jamaica. Native of tropical Africa. COCUISA. AFRICAN BOWSTRING-HEMP. GUANA-TAIL.

Cordyline cylindrica (Bojer) Britton, African, successfully grown by Mr. Fairchild at Louisenhöj, St. Thomas, has cylindric longitudinally grooved leaves about 8 dm. long. [*Sansevieria cylindrica* Bojes.]

2. **ALOE** L. Sp. Pl. 319. 1753.

Succulent plants with a short or elongated caudex, the thick tufted leaves with spiny-toothed margins, the racemose flowers nodding. Perianth subcylindric, the segments connivent or coherent, their tips somewhat spreading. Stamens 6, with slender filaments and oblong anthers. Ovary sessile, 3-angled and 3-celled;

style subulate, tipped by the small stigma; ovules many in each cavity of the ovary. Capsule leathery, loculicidally dehiscent. Seeds numerous, black. [Name ancient.] Over 80 species, mostly African. Type species: *Aloe perfoliata* L.

1. **Aloe vulgaris** Lam. Encycl. 1: 86. 1783.

Aloe perfoliata vera L. Sp. Pl. 320. 1753.

Aloe vera L. Sp. Pl. ed. 2. 458, hyponym. 1762; Webb. & Berth. Phyt. Canar. 3: 348. 1836-50. Not *A. vera* Mill. 1768.

Acaulescent, or usually so, stoloniferous. Leaves narrowly lanceolate, 3-6 dm. long, long-acuminate, turgid, pale glaucous-green, watery within, the marginal spiny teeth 2 cm. apart or less; scape stout, 6-12 dm. high, bearing distant broad acute scales; raceme dense, 1-3 dm. long; bracts lanceolate to ovate, acute, longer than the short pedicels; flowers yellow, about 2.5 cm. long; stamens about as long as the perianth, the style longer. [*A. perfoliata* of West, not of Linnaeus.]

Coastal rocks and dry hillsides, Porto Rico, spontaneous after cultivation; Vieques; St. Thomas; St. Jan; Virgin Gorda; St. Croix;—Bermuda; West Indies; Central America; Florida. Native of the Mediterranean Region. ZABILA. ALOES. SEMPER VIVE.

The following species of *Aloe* mostly from southern Africa, among others sent from the New York Botanical Garden to Louisenhoj, St. Thomas, in 1921, were doing well there in 1923:

Aloe arborescens Mill.

Aloe ciliaris Haw.

Aloe ferox Mill.

Aloe grandidentata Salm-Dyck

Aloe Greenii Baker.

Aloe obscura Mill.

Asparagus officinalis L., ASPAGARUS, European, is occasionally planted for food in Porto Rico, and in the Virgin Islands, but the climate is too warm for its successful development and continuance.

Asparagus Sprengeri Regel, African, is grown for ornament in Porto Rico and the Virgin Islands. The slender branches are 2 m. long or less, the flat linear leaf-like phyllodes 2-4 cm. long, the pinkish-white flowers fragrant, the coral-red berries often slightly 3-lobed. An excellent plant for hanging baskets.

Asparagus plumosus Baker, native of South Africa, also grown for ornament in Virgin Island and Porto Rico gardens, and on porches, is an herbaceous climber, with very small leaves and white blossoms.

Allium Cepa L., ONION, CEBOLLA, Persian, is sometimes grown for food in Porto Rico and the Virgin Islands. It is a rather tall herb with terete hollow leaves; the long glaucous scapes are swollen near the middle, the white or bluish flowers borne in a large globular umbel, the bulbs large, with few offsets.

Allium fistulosum L., WELSH ONION, Siberian, is very similar to the preceding and sometimes cultivated in the Virgin Islands. It differs, however, in having no distinct bulb, but only an enlarged base.

Allium scorodoprasum L., ROCAMBOLE, European, is recorded by Krebs as grown in St. Thomas prior to 1851.

Allium Porrum L., LEEK, European, is planted for food in Porto Rico and Virgin Islands gardens. It is a rather stout herb, sometimes 2 feet or more in height; the leaves are broad and not hollow, the bulb simple and little larger than the stalk.

Allium sativum L., GARLIC, European, is also cultivated for food. It is a fleshy herb a foot or less in height; the narrow leaves keeled, and not hollow, the bulbs are small, separating into many bubblots covered with dry scales.

Allium ascalonium SHALLOT, of Syrian origin, occasionally grown in the Virgin Islands, has lilac flowers and elongated pointed bulbs, the leaves hollow.

Aspidistra lurida Ker., Chinese, occasionally grown for ornament in Porto Rico gardens has many oblong-lanceolate basal leaves 3-6 dm. long, and purplish flowers on short scapes, the perianth-segments and stamens 8.

Gloriosa superba L. CLIMBING LILY, of the Old World tropics, seen in Miss Quin's garden at Christiansted, St. Croix, forms an herbaceous vine 1 m. long or longer, with lanceolate thin leaves 7-10 cm. long, their tips tapering into a coiled tendril; the long-peduncled solitary flowers are reddish-yellow, about 10 cm. broad, with 6 wavy crisped segments.

Dracaena terminalis L., of tropical Asia, is commonly grown for ornament in Porto Rican gardens. The slender stems are 1-2 m. or more high, the green or rarely colored, oblong, elliptic or elliptic-lanceolate leaves 3-5 dm. long, the slender channeled petioles 9-16 cm. long, the pedicels very short or none, the white or colored perianth 10-12 mm. long, the segments short, the ripe berries red. [*Asparagus terminalis* L.; *Cordylina terminalis* Kunth.]

Dracaena Draco L., DRAGON'S-BLOOD TREE, of the Canary Islands seen as seedlings at the St. Croix Agricultural Experiment Station, becomes in its native home a large branching tree up to about 18 meters high and attains great age.

Dracaena fragrans Ker., African, planted for ornament in Porto Rico and Virgin Island gardens, becomes 4-6 m. high, usually simple, with oblanceolate leaves 6-9 dm. long, and a large panicle of yellow flowers. [*D. Massangeana* of gardeners.]

Many horticultural varieties and hybrids of *Dracaenas* are grown for ornament in Porto Rico and the Virgin Islands. The Porto Rico Nursery Company exports them as canes to northern florists.

Yucca aloifolia L., SPANISH BAYONET of the southeastern United States, grown in Porto Rico gardens and occasionally seen on roadsides, has slender stems occasionally up to 4 m. tall, the dagger-like scabrous-margined leaves 3-9 dm. long, the white flowers 4-6 cm. long, sometimes tinged with purple, the nodding indehiscent pulpy capsule 7-9 cm. long. Some people have the curious taste of sticking empty egg-shells on the tips of the leaves and accumulating these until every leaf is thus appendaged.

Yucca gloriosa L., SPANISH BAYONET, native of the southeastern United States, is occasionally planted in gardens and near dwellings on St. Croix and St. Thomas. The tall stems are usually simple, the linear-lanceolate leaves 3-5 dm. long, the showy white flowers sometimes tinged with red, the dry oblong-ellipsoid indehiscent leathery capsule 5-6 cm. long. [*Yucca acuminata* Sweet.]

Several species of the South African genus **Gasteria**, sent from the New York Botanical Garden to Louisenhøj, St. Thomas, in 1921, were becoming established there in 1923. These curious plants have thick, often mottled, and roughened

short basal leaves arranged in a flattened spiral, and appearing as if 2-ranked, the small tubular ventricose flowers in a raceme.

Haworthia tessellata Haw., African, sent to Louisenhoj from the New York Botanical Garden in 1921, apparently established there in 1923, has basal stiff, spirally arranged, toothed thick fleshy leaves 3-4 cm. long, and a simple raceme of small tubular, greenish white flowers.

Dasyllirion glaucophyllum Hook., Mexican, successfully established at Louisenhoj, St. Thomas, has a short trunk bearing very many densely crowded, stiff linear prickly-margined glaucous leaves about 1 cm. wide; the small whitish dioecious flowers are borne in a panicle on a terminal peduncle 4 m. high or higher.

Family 2. **SMILACACEAE** Vent.

SMILAX FAMILY.

Vines, sometimes shrubs or herbaceous perennials, with smooth or prickly stems. Leaves alternate, the blades netted-veined, usually punctate or lineolate, articulated to the petioles. Petioles sheathing, commonly bearing a pair of slender tendril-like appendages. Flowers dioecious, in axillary peduncled umbels. Perianth-segments 6. Stamens mostly 6. Filaments distinct, inserted at the bases of the perianth-segments. Anthers 2-celled, introrse, attached at the base. Ovary 3-celled, rarely 1-celled, the ovules 1 or 2 in each cavity, pendulous, orthotropous. Style very short or none. Stigmas 3, rarely only one. Fruit a small berry. Seeds 1-6. Endosperm bony. Embryo small, remote from the hilum. About 3 genera and over 225 species, natives of temperate and tropical regions.

1. **SMILAX** [Tourn.] L. Sp. Pl. 1028. 1753.

Mostly vines with unarmed or prickly-armed stems, woody or fleshy tubers, or long creeping rootstocks, and annual or perennial stems. Leaf-blades often leathery, entire or lobed. Petioles furnished with coiling appendages. Flowers regular. Perianth-segments distinct. Pelicels born on a globose or conic receptacle, inserted in small pits, usually among minute bractlets. Staminate flowers without or with an abortive ovary. Pistillate flowers usually smaller than the staminate, with an ovary and usually with several abortive stamens. Berry red, blue or black. Embryo lying under a tubercle at the upper end of the seed. [An ancient Greek name of obscure meaning.] Over 200 species of wide geographic distribution. Type species: *Smilax aspera* L.

Prickly armed or sometimes unarmed vine; leaf-blades usually rigid-coriaceous, often rounded and cordate at the base; perianth-segments 2-3 mm. long.

1. *S. coriacea*.

Unarmed vines; leaf-blades thin, often pointed at both ends; perianth-segments 3.2-4 mm. long.

2. *S. dominicensis*.

1. **Smilax coriacea** Spreng. Syst. Veg. 2: 103. 1825.

Smilax ilicifolia Desv. in Hamilt. Prodr. 58. 1825.

Smilax havanensis portoricensis A. DC. Monog. Phan. 1: 124. 1878.

Smilax guianensis subarmata O. E. Schulz in Urban, Symb. Ant. 4: 149. 1903.

Smilax coriacea ilicifolia O. E. Schulz in Urban, Symb. Ant. 4: 150. 1903.

Smilax subarmata O. E. Schulz in Urban, Symb. Ant. 5: 28. 1904.

A glabrous woody vine, 3-6 m. long, the stems and branches unarmed or armed with rather stout brownish prickles, 1-7 mm. long. Petioles 5-12 mm. or

more long; leaf-blades coriaceous, oblong-ovate to oval-ovate, or linear-lanceolate, 5-17 cm. long, 1-12 cm. broad, 5-7-nerved, acute or sometimes rounded at the apex, cordate at the base, more or less reticulate-veined, entire or spiny-toothed on the margins; peduncles 2-5 mm. long; pedicels slender; perianth segments oblong, 2-3 mm. long; anthers oblong; ovary subglobose; berries dark red or black, subglobose, 5-8 mm. in diameter; seeds reddish brown, 4-4.5 mm. long, 3.5-4 mm. broad, the surface more or less pitted. [*S. havanaensis* of Cook & Collins, not of Jacquin.]

Coastal hillsides, sandy plains, wooded valleys and mountain woodlands, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix; Tortola; Virgin Gorda:—Hispaniola.

Smilax lappacea Willd., a Venezuelan species, is recorded from Porto Rico by O. E. Schulz, but we have been unable to verify this record; the leaves of *S. coriacea* are very variable in shape and size; his records of *S. ilicifolia sub-lappacea* from Porto Rico and St. Croix, presumably refer also to specimens of *S. coriacea*.

2. ***Smilax domingensis*** Willd. Sp. Pl. 4: 783. 1806.

A glabrous unarmed high-climbing vine, often 6 m. long or longer, the slender branches more or less zigzag, terete or somewhat angled, striate. Petioles slender, 10-15 mm. long; leaf-blades subcoriaceous, lanceolate to ovate, 5.5-13 cm. long, 3-7 cm. broad, 3-5-nerved, with an additional marginal pair of nerves, long-acuminate at the apex, acute or sometimes rounded at the base, entire, rather indistinctly reticulate-veined; peduncles usually much shorter than the petioles; pedicels slender, 5-9 mm. long; perianth-segments lanceolate or oblong-elliptic, 3.2-4 mm. long; anthers linear; ovary ovoid; berries black, 1-3-seeded, 0.8-1 cm. in diameter; seed brown, 6 mm. long, 5-5.5 mm. broad, rugulose.

Hillsides and mountain woodlands, Porto Rico:—Cuba; Jamaica; Hispaniola; Mexico. BEJUCO DE MEMBRILLO. DUNGUEZ BLANCO. Erroneously recorded from Carolina and Louisiana, and apparently, also from St. Thomas.

Smilax rotundifolia L., a plant of eastern and southern United States, has been recorded by Bello from Porto Rico, and is cited by O. E. Schulz from St. Croix. Neither of these records have been verified by the writers, but they are apparently either errors in locality, or determination, as the species is otherwise unknown from the West Indies.

Family 3. **AMARYLLIDACEAE** Lindl.

AMARYLLIS FAMILY.

Mostly perennial herbs (some tropical species woody or even arborescent), mostly with bulbs or corms, scapose or sometimes leafy stems and usually narrow and entire leaves. Flowers perfect, regular or nearly so. Perianth 6-parted or 6-lobed, the segments or lobes distinct, or united below into a tube which is adnate to the surface of the ovary. Stamens 6, one opposite each segment of the perianth, rarely numerous or only 3; filaments filiform, free or united in a cup; anthers long or short, basifixed or versatile, dehiscing usually by introrse longitudinal slits. Ovary inferior, 3-celled; style entire; stigmas 3; ovules usually numerous and superposed. Fruit usually a three valved capsule with loculicidal dehiscence, sometimes indehiscent. Seeds usually numerous; endosperm fleshy, rarely horny; embryo small. About 70 genera and over 800 species, principally natives of tropical and warm regions, some in the temperate zones.

Plants with rootstocks or corms.

Small herbs with thin, grass-like leaves; capsule circumscissile, or fruit indehiscent.

Perianth with a tube; fruit indehiscent.

Perianth without a tube; fruit a capsule with circumscissile dehiscence.

Large mostly fleshy-leaved herbs, the leaf margins often armed with straight or curved teeth; capsule 3-valved.

Perianth funnel-shaped; flowers greenish-yellow or yellow; filaments filiform.

Perianth whitish, rotate; filaments with cushion-like swellings at the base.

Bulbous plants.

Filaments distinct.

Spathe tubular-sheathing in the lower half; flowers solitary.

Spathe 2-4-valved; flowers usually 2 or more in an umbel.

Perianth-tube provided with scales or a corona at the throat; seeds black.

Perianth-tube without scales or a corona at the throat; seeds green.

Filaments connate below into a cup-like or funnelliform crown; ovules 2 in each cell of the ovary.

1. *Curculigo*.

2. *Hypoxis*.

3. *Agave*.

4. *Furcraea*.

5. *Atamosco*.

6. *Hippeastrum*.

7. *Crinum*.

8. *Hymenocallis*.

1. **CURCULIGO** Gaertn. Fr. & Sem. 1: 63. 1788.

Annual or perennial stemless herbs with sessile, narrow basal leaves. Flowers yellow, solitary, subtended by a sheathing bract. Perianth 6-parted, persistent or at length withering away, the tube much elongated above the ovary. Stamens 6, inserted at the bases of the perianth-segments; filaments short; anthers lanceolate or linear. Ovary 3-celled, with numerous ovules in two rows in each cell; style columnar, short, stigmas 3, erect; ovules anatropous; funicle elongate. Fruit somewhat fleshy, indehiscent, more or less beaked. Seeds black, crustaceous, shortly beaked. [Latin, weevil, referring to the beak on the seed.] A few species, natives of tropical regions. Type species: *Curculigo orchitoides* Gaertn.

1. **Curculigo scorzoneraefolia** (Lam.) Benth.; Baker, Jour. Linn. Soc. 17: 124. 1878.

Hypoxis scorzoneraefolia Lam. Encycl. 3: 183. 1789.

Corm oblong-cylindric, 2-4.5 cm. long. Leaves linear or lanceolate, 1-3.4 dm. long, 1.5-11 mm. wide, acuminate at the apex, tapering to the base, pilose or glabrous; scape short, 1 flowered, pilose; bract lanceolate, membranous; perianth-tube 2-4 cm. long, the segments oblong-lanceolate or lanceolate, 9-12 mm. long, 1.6-3.5 mm. broad, yellow, often loosely pilose on the back; ovary oblong-ellipsoid; style filiform; stigma small; capsule ellipsoid, indehiscent; seeds ellipsoid, 2.5 mm. long, black, shining.

In red clay, Monte Mesa, Mayaguez, and in cultivated ground, Rio Piedras, Porto Rico.—Cuba; Jamaica, Dominica to Trinidad; Central and South America.

2. **HYPOXIS** L. Syst. ed. 10, 986. 1759.

Low, often pubescent herbs, with a corm or short rootstock, linear grass-like leaves and slender few-flowered scapes. Perianth 6-parted, the segments equal or nearly so, separate to the summit of the ovary, withering-persistent. Stamens inserted on the bases of the perianth-segments; filaments short; anthers erect, sagittate or entire. Ovary 3-celled; style short; stigmas 3, erect; ovules numerous, in 2 rows in each cavity. Capsule thin-walled, usually opening with circumscissile dehiscence below the apex. Seeds globular, black. [Greek, originally given to some plant with sour leaves.] About 50 species, widely distributed in temperate and tropical regions. Type species: *Hypoxis decumbens* L.

1. *Hypoxis decumbens* L. Syst. ed. 10, 986. 1759.

A more or less pilose herb, 1-6 dm. tall. Corm subglobose or broadly ellipsoid, 8-13 cm. in diameter; leaves linear, 8-50 cm. long, 2-9 mm. wide, loosely pilose; scapes filiform, shorter than the leaves, usually more than 1-flowered; bracts small, linear-subulate; pedicels pilose; perianth-segments narrowly lanceolate or lanceolate, 5-6 mm. long, 1.2-1.5 mm. wide; greenish and pilose outside, yellow within; filaments filiform; anthers sagittate; style subulate; capsule clavate, 7-12 mm. long.

Moist hillsides, ravines, roadsides and grassy places, Porto Rico; St. Jan, Tortola; Virgin Gorda.—Cuba to Trinidad; Jamaica; continental tropical America.

3. *AGAVE* L. Sp. Pl. 323. 1753.

Large herbs, often fleshy, the stem short or wanting. Leaves mostly in a close rosette, usually stiff, persistent, the margins mostly armed with straight or curved teeth and the apex tipped with a usually pungent spine. Flowers in spikes or panicles on tall scapes. Perianth 6-parted, more or less funnel-shaped, Stamens 6, usually long-exserted. Ovary 3-celled; style 1; stigma capitate 3-lobed; ovules numerous, in 2 rows in each cavity of the ovary. Capsule thick-walled, many-seeded. Seeds numerous, flat, thin, black. [Greek, signifying noble.] Over 250 species, natives mostly of the tablelands of Mexico, known as CENTURY-PLANTS, KARATA, and CORITA. Type species: *Agave americana* L.

Leaves fleshy, usually curved; plants not suckering.

Leaves 10-15 cm. broad; prickles 1 mm. long or less, nearly straight.

Leaves 15-23 cm. broad; prickles 2-6 mm. long, straight or retrorsely turned.

Leaves hard and straight; plants freely suckering.

1. *A. Eggersiana*.

2. *A. missionum*.

3. *A. sisalana*.

1. *Agave Eggersiana* Trel. Mem. Nat. Acad. Sci. 11: 28. 1913.

Acaulescent, not caespitose. Leaves narrowly lanceolate, 12-20 dm. long, 10-15 cm. broad, dull green and somewhat glaucous when young; spine conic awl-shaped, brown, smooth, rather glossy, 10-15 mm. long, 3 mm. broad, decurrent for its length or more and dorsally intruded into the green tissue; prickles brown, usually 1 mm. long, nearly straight, narrowly triangular from lenticular bases; inflorescence 5 m. high or more; pedicels 20-25 mm. long; perianth yellow, 5-6 cm. long, the segments 2-2.5 cm. long; filaments 4.5-5 cm. long; capsule unknown; bulbils produced abundantly. [Recorded by West, Grisebach, Eggers (in part) and Millspaugh as *Agave americana* L.]

Hillsides and plains, eastern dry districts of St. Croix. Endemic. Cultivated on St. Croix and St. Thomas for ornament. The leaves are nearly straight.

2. *Agave missionum* Trel. Mem. Nat. Acad. Sci. 11: 37. 1913.

Agave portoricensis Trel. loc. cit. 38. 1913.

Acaulescent, not caespitose. Leaves lanceolate to broadly lanceolate, 15-25 dm. long, 15-23 cm. broad, dark green and glossy, slightly glaucous when young; spine awl-shaped, brown or gray in age, smooth, somewhat glossy, 10-20 mm. long, 3.5-5 mm. broad, decurrent and dorsally produced into the green tissue; prickles brown or blackish, 2-6 mm. long, straightly or retrorsely turned, heavily triangular from lenticular bases; inflorescence 5-7 m. high; pedicels 1-2 cm. long; perianth greenish-yellow, 4.5-5.2 cm. long, the segments 15-20 mm. long; filaments 3-3.5 cm. long; capsule broadly elliptic or subglobose, 2.5-3.8 cm. long, 2-2.5 cm. in diameter; seeds 6-8.5 mm. long, 5-6 mm. broad. [Recorded by Eggers as *A. americana*, *A. sobolifera* and *A. Morrisii*, by Bello and by Urban as *A. americana*.]

Coastal rocks, limestone cliffs, and rocky hillsides; southern and southwestern dry districts of Porto Rico; Culebra; Vieques; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada. Endemic.

3. *Agave sisalana* Perrine, House Rep. Document 564: S. 1838.

Agave rigida sisalana Engelm. Trans. Acad. St. Louis 3: 316. 1876.

Subcaulescent. Leaves linear-lanceolate, 10 dm. or more long, 7–10 cm. broad, green and somewhat glossy; spine dark brown, 18–30 cm. long, 4 or 5 mm. wide, somewhat pitted and glossy, shallow-round-grooved near the base, not decurrent; prickles often nearly black, 2–4 mm. long, mostly upcurved, very slender-cuspid from deltoid bases or usually entirely suppressed; inflorescence 5–6 m. high; pedicels 5–10 mm. long; perianth yellowish green, 4.5–6 cm. long; filaments 4–8 mm. long; capsule elliptic-oblong, 5.5–6 cm. long, 2–2.5 mm. wide, stipitate and beaked; seeds 9–10 mm. long, 6–7 mm. wide.

Established from abandoned trial fields, St. Croix; cultivated for fiber in Porto Rico and the Virgin Islands:—Naturalized in Florida and the West Indies and widely cultivated. Native of Yucatan. SISAL.

Agave fourcroydes Lemaire, HENNEQUEN, of Yucatan, also planted for fiber in Porto Rico and the Virgin Islands differs from *A. sisalana* in having bluish-gray prickly leaves and a definite trunk up to 2 m. high.

Agave americana L., CENTURY PLANT, probably of Mexican origin, planted in Porto Rico and the Virgin Islands, has large grey leaves, commonly white-margined, or white-banded, with large prickles on the teeth, the flowers 6–7 cm. long in a very large dense panicle.

Agave evadens Trelease, native of Trinidad sent from the New York Botanical Garden to Louisenhøj, St. Thomas, in 1921 and reported by Mr. Fairchild to have done very well there, is a green-leaved species, the large leaves with a stout terminal spine, the yellow flowers about 4.5 cm. long, in an open panicle.

Agave Jacquiniana Schultes, sent to Louisenhøj from the New York Botanical Garden in 1921 was also well established in 1923. It has a short trunk, gray-green prickly leaves about 6 dm. long, the greenish flowers about 5 cm. long.

Agave neglecta Small, Floridian, also sent to Louisenhøj from the New York Botanical Garden in 1921, and reported as doing well, has glaucous leaves over 2 meters long, their margins armed with many minute teeth; the yellowish green flowers are about 5.5 cm. long.

Agave mexicana Haw. and *Agave vivipara* L. are recorded by Krebs as formerly grown on St. Thomas, but it is not known to which species the plants he observed would be referred at the present time. Other species, not certainly determined for want of flowers, have been seen in cultivation.

4. **FURCRAEA** Vent. Bull. Soc. Philom. 1: 65. 1793.

Succulent herbs, often large and *Agave*-like, with tall scapes, the inflorescence terminal, paniculate. Leaves with spiny or minutely toothed margins. Perianth wheel-shaped, of 6 spreading segments. Stamens borne on the bases of the perianth-segments, the filaments with a cushion-like swelling at the base; anthers linear-oblong. Ovary 3-celled, with many ovules in two rows in each cavity; style rather stout, 3-angled and thickened below, tipped by a small stigma. Capsule oblong, 3-sided, 3-valved. Seeds numerous, flat. [Dedicated to Antoine Francois' de Fourcroy.] About 20 species, natives of tropical America, many of them yielding fiber. Type species: *Furcraea cubensis* Vent.

1. *Furcraea tuberosa* Ait. f. Hort. Kew. Ed. 2, 2: 303. 1811.

Agave campanulata Sessé & Moc. Fl. Mex. ed. 2, 87. 1894.

Trunkless, or with a short caudex. Leaves broadly lanceolate, 12 dm. or more long, 13-18 cm. broad at the middle; teeth 2-4 mm. long, straight or curved; sometimes absent near the apex; inflorescence, 6-7 m. high; perianth greenish-white, outer perianth segments oblong-lanceolate or lanceolate, 2.4-2.7 cm. long, 7-10 mm. wide, the inner segments broader; capsule unknown; freely bulbiferous, the bulbs elongated. [Recorded by Eggers and by Millspaugh as *F. cubensis*, by Cook and Collins as *F. gigantea*, and by Urban as *F. hexapetala*.]

Coastal cliffs, rocky plains, dry thickets and hillsides, Porto Rico; Mona; Culebra, Vieques; St. Thomas; Tortola; Anegada; St. Croix;—Hispaniola to Grenada. MARGUET. CUCUISA. FEMALE KARATA. The leaves are straight, somewhat plicate.

Furcraea elegans Todaro, native of Guiana, sent to Louisenhøj, St. Thomas from the United States Department of Agriculture in 1921, had made slow growth up to March, 1923, but appeared to be established.

Furcraea andina Trelease, Peruvian, grown at the Agricultural Experiment Station, Mayaguez, Porto Rico, has narrowly lanceolate leaves, with small approximate marginal prickles; its bulbils are ovoid-conic.

Furcraea macrophylla Baker, Bahamian, also grown at Mayaguez, resembles *F. tuberosa*, but has much shorter bulbils.

5. **ATAMOSCO** Adans. Fam. Pl. 2: 57, 522. 1763.

[ZEPHYRANTHES Herb. App. 36. 1821.]

Acaulescent herbs, with coated bulbs and glabrous foliage. Leaves basal, the blades narrowly linear, flat, channeled. Scape 1-flowered. Perianth funnel-shaped, white, red, pink, purplish or yellow, erect or slightly inclined, the lobes 6, subequal. Stamens 6, equal or nearly so; filaments adnate to the throat of the perianth-tube; anthers versatile. Ovary 3-celled; style filiform, 3-lobed at the top, or the stigma nearly capitate; ovules numerous, in two rows in each cavity. Capsule 3-celled, more or less 3-lobed, loculicidally 3-valved. Seeds blackish, usually flattened. [Aboriginal name.] About 35 species, natives of the warmer regions of America. Type species: *Amaryllis Atamasco* L.

Perianth white.

1. *A. tubispatha*.

Perianth red.

Perianth 3-3.5 cm. long; pedicels longer than the spathe.

2. *A. rosca*.

Perianth 6-7.5 cm. long; pedicels shorter than the spathe.

3. *A. carinata*.

1. *Atamosco tubispatha* (L'Herit.) Maza, Rev. Fac. Let. Ci. Univ. Habana 19: 227. 1914.

Amaryllis tubispatha L'Herit. Sert. Ang. 9. 1788.

Zephyranthes tubispatha Herb. App. 36. 1821.

Bulb subglobose, 2-2.5 cm. in diameter, its neck short. Leaves narrowly linear, 1.6-3 dm. long; scape slender, 1 dm. long or more; spathe 2.5-3.5 cm. long; pedicels longer than the spathe; perianth white, slightly tinged with green, 4-5 cm. long, the tube short, the segments obovate, 8-10 mm. broad; stamens about as long as the perianth; style deeply trifid, overtopping the anthers; capsule about 11 mm. in diameter.

Grassy places, Porto Rico; St. Thomas, St. Croix; St. Jan; Tortola;—Cuba and Jamaica to Tobago; northern South America. Grown for ornament in Porto Rico and Virgin Island gardens.

2. **Atamosco rosea** (Lindl.) Greene, *Pittonia* 3: 188. 1897.

Zephyranthes rosea Lindl. Bot. Reg. pl. 821. 1824.

Amaryllis rosea Spreng. Syst. 4: Cur. Post. 133. 1827.

Bulb subglobose, 2–2.2 cm. in diameter, short-necked. Leaves linear, 2–5.5 mm. wide; scape 10–25 cm. long, often longer than the leaves; pedicels longer than the spathe; perianth bright red, 3–3.5 cm. long, the tube short, greenish, the segments obovate; stamens much shorter than the perianth; style nearly as long as the perianth.

Escaped from cultivation, for ornament Porto Rico:—Cuba. Naturalized in Bermuda and the Bahamas.

3. **Atamosco carinata** (Herb.) P. Wilson.

Zephyranthes carinata Herb. Bot. Mag. 52: pl. 2594. 1825.

Amaryllis carinata Spreng. Syst. 4: Cur. Post. 132. 1827.

Bulbs ovoid, about 2.5 cm. in diameter, short-necked. Leaves linear, 1.5–3 dm. long, 5–9 mm. wide; scape slender, 1.7–2.5 dm. high; spathe 3.5–4.5 cm. long, the valves lanceolate; pedicels shorter than the spathe; perianth bright rose-red, 6–7.5 cm. long, the tube 1.4–2 cm. long, the segments obovate, 1.3 cm. or more broad; stamens about half as long as the perianth; ovary stalked; style overtopping the stamens, deeply trifid. [*Amaryllis Atamasco* of West, and of Krebs, not of Linnaeus.]

Porto Rico and St. Croix, according to Urban:—Guadeloupe, Martinique; Mexico; Central America. DUENDE ROSADO.

6. **HIPPEASTRUM** Herb. App. 31. 1821.

Bulbous plants with linear or strap-shaped leaves. Flowers large, showy, usually two or more, borne on a stout, hollow, leafless scape. Perianth funnel-shaped, often more or less nodding, the tube short or long, provided with scales or a corona at the throat, the segments nearly equal. Stamens inserted at the throat of the tube; filaments filiform; anthers linear or linear-oblong, versatile. Ovary 3-celled; ovules many, superposed; style long; stigma capitate or trifid. Capsule globose, loculicidally 3-valved. Seeds usually flattened, with a thick black testa. [Greek, knight's-star.] About 60 species, natives of tropical America. Type species: *Hippeastrum crocatum* Herb.

1. **Hippeastrum puniceum** (Lam.) Urban, *Symb. Ant.* 4: 151. 1903.

Amaryllis punicea Lam. Encycl. 1: 122. 1783.

Amaryllis equestris Ait. Hort. Kew. 1: 417. 1789.

Hippeastrum equestre Herb. App. 31. 1821.

Hippeastrum purpureum Kuntze, Rev. Gen. Pl. 703. 1891.

Amaryllis biflora Sessé & Moc. Fl. Mex. ed. 2, 87. 1894.

Bulb globose or globose-ovoid, stoloniferous, 4–5 cm. long, with brown coats. Leaves strap-shaped or oblong-lanceolate, 2.8–6.5 dm. long, 2.5–5 cm. wide, gradually narrowed to the apex; scape terete, glaucous, 4–6 dm. high; umbel 2–4-flowered; spathe-valves lanceolate; pedicels 3.5–7 cm. long; perianth 9–12 cm. wide when expanded, the segments elliptic-obovate or obovate, bright red with green at the base; stamens shorter than the segments.

Fields, hillsides, and roadsides, Porto Rico; St. Thomas; St. Croix; St. Jan; Tortola:—Cuba and Jamaica to Trinidad; continental tropical America. Consists of several races, some of these planted for ornament. AMAPOLA. BARBADOS LILY.

7. **CRINUM** L. Sp. Pl. 291. 1753.

Bulbous acaulescent herbs, with showy flowers. Leaves linear or somewhat broadened upward, spreading or arching. Scape solid, erect. Flowers large, umbelled. Spathe 2-valved. Perianth funnel- or salver-shaped, the tube straight or curved, the lobes linear or oblong. Stamens 6, the filaments filiform, the anthers linear, versatile. Ovary 3-celled; ovules few; style slender, elongated; stigma entire. Fruit subglobose, membranous or coriaceous, bursting irregularly. Seeds few, large, round, testa thick; albumen copious. [Greek name for a lily.] Over 80 species, natives of warm and tropical Asia, Africa, Australia and America. Type species: *Crinum americanum* L.

1. **Crinum zeylanicum** L. Syst. ed. 12, 236. 1767.

Amaryllis zeylanica L. Sp. Pl. 293. 1753.

Bulb subglobose, 10–15 cm. in diameter, the neck short. Leaves sword-shaped, 6–9 cm. long, 6–10 cm. wide; peduncles stout, often tinged with red; flowers 10 or more in an umbel, short-pedicelled, the perianth-tube curved, 7–15 cm. long, green or tinged with red, the lobes oblong-lanceolate, 7.5–10 cm. long, 2–2.5 cm. wide, white with a broad red keel; stamens shorter than the perianth-lobes.

Escaped from cultivation near Utuado, Porto Rico; St. Croix; St. Thomas.—Native of tropical Asia and Africa. Recorded by Millspaugh as *C. longiflorum* Herb. and *C. erubescens* Ait., and by Krebs and by Eggers as *C. erubescens* Ait.

Crinum amabile Donn., of Sumatra, is planted in Porto Rico and St. Thomas. It is a large fleshy herb with green strap-shaped leaves 9–12 dm. long and 7–10 cm. wide, the fragrant flowers are 20 or more in an umbel, the erect perianth-tube is sometimes 10 cm. long, bright red, the linear perianth-segments are 9–13 cm. long, red on the outside.

Crinum giganteum Andr., African, recorded by Eggers as cultivated in the Virgin Islands, has large globose bulbs 10–15 cm. in diameter, the lanceolate leaves are 6–9 dm. long, with distinct cross veinlets, the flowers are usually about 8 on a stout compressed peduncle, the slender perianth-tube is 11–17 cm. long, the perianth-segments pure white.

8. **HYMENOCALLIS** Salisb. Trans. Hort. Soc. 1: 338. 1812.

Mostly tall acaulescent herbs, with coated bulbs, sessile or petioled linear or lanceolate basal leaves, and large white sessile or pedicelled, umbelled flowers on solid scapes, each flower subtended by 2 membranous bracts. Perianth of 6 spreading or recurved lobes, united below into a long cylindrical tube. Stamens 6, the filaments free above but webbed and united into a membranous cup below; anthers linear, versatile. Ovary 3-celled; ovules 2 in each cavity; style filiform, long-exserted; stigma small, entire or nearly so. Capsule rather fleshy. Seeds usually 1 or 2, large, green, fleshy. [Greek, beautiful membrane, referring to the staminal-cup.] About 30 species, natives of America. Type species: *Hymenocallis littoralis* Salisb.

1. **Hymenocallis declinata** (Jacq.) M. Roem. Fam. Nat. 4: 171. 1847.

Pancreatium declinatum Jacq. Sel. Am. 99. 1763.

Pancreatium expansum Sims, Bot. Mag. pl. 1941. 1817.

Hymenocallis expansa Herb. App. 44. 1821.

Bulb subglobose, often 8 cm. in diameter. Leaves fleshy, sessile, linear-oblong, 4–7 dm. long, 3.5–6.5 cm. wide, acute or rounded at the apex, gradually

narrowed to the base, dark green; scape stout, as long as the leaves or shorter; flowers 5 or more, sessile, fragrant; bracts ovate to lanceolate, 3–6 cm. long, acute or acuminate; ovary oblong, 1–1.5 cm. long; perianth-tube slender, 5–10 cm. long; perianth-segments linear, 8–12 cm. long, longer than the tube; staminal-cup 3–4 cm. long, about one third as long as the stamens. [Recorded by Eggers as *Pancratium caribaeum* and by Millspaugh and by Urban as *Hymenocallis caribaea*. Bello recorded *Pancratium caribaeum* and also *P. carolinianum* as Porto Rican, but we have been able to identify only one species of *Hymenocallis* within our area.]

Coastal sands, hillsides, and along streams, Porto Rico; Culebra, St. Thomas; St. Croix; St. Jan.—Bermuda; Bahamas to St. Kitts and Montserrat. LIRIO. SPIDER LILY.

Hymenocallis undulata Herb. [*Pancratium undulatum* Kunth]. Venezuelan, is recorded by Krebs as observed in St. Thomas, prior to 1851, perhaps in cultivation, perhaps an erroneous record.

Molineria hortensis Britton, sp. nov. Similar to *M. recurvata* (Dryand) Herb., [*Curculigo recurvata* Dryand.] Leaves about 1 m. long, 12–15 cm. wide, long-acuminate, the petiole about one-half as long as the blade; peduncles stout, tomentose, about 1.5 cm. long; heads nodding, densely many-flowered, 5–6 cm. in diameter; bracts lanceolate, long-acuminate, villous, the lower ones 4–5 cm. long, the others shorter; perianth yellow, much shorter than the bracts.

Cultivated in Porto Rico gardens, its origin unknown, presumably from tropical India, or Malaya. Type from a garden near La Muda (*Britton 7892*); in flower March, 1923.

Polianthes tuberosa L., TUBEROSE, Mexican, grown in Porto Rico and Virgin Island gardens, has a tuberous rootstock, erect stems 6–9 dm. high bearing several narrowly linear leaves and a terminal spike of pure white fragrant waxy flowers, the perianth-segments about 2–2.5 cm. long, the tube bent near the base.

Eucharis grandiflora Planch. [*E. amazonica* Lindl.], AMAZON LILY, South American, grown in Porto Rican and Virgin Island gardens, is bulbous, with elliptic or elliptic-oblong leaves 2–3 dm. long, and 11–15 cm. wide on petioles 15 cm. or more long, the umbelled white flowers with a cylindric, often curved, tube, an expanded throat and 6 spreading starlike segments about 3 or 4 cm. long, the staminal cup of six connate segments. Also known as ANNUNCIATION LILY.

Sprekelia formosissima (L.) Herb., Mexican, occasionally grown for ornament in Virgin Island gardens, is bulbous, with linear leaves and a hollow scape bearing one large red declined flower with nearly equal segments, the lower ones concave and partly enclosing the stamens and pistil. [*Amaryllis formosissima* L.]

Amaryllis Belladonna L., BELLADONNA LILY, South African, planted for ornament in Virgin Island gardens, has scapes 6–12 dm. high, bearing an umbel of large, short-pedicelled, rose-red, fragrant flowers which bloom before the narrow strap-shaped leaves appear.

Cyrtanthus uniflorus Ker., South African, recorded by Krebs as formerly grown in St. Thomas, has a small globose bulb, narrow linear leaves, the scape bearing one to three nearly erect and nearly white flowers about 5 cm. long [*Amaryllis pumilio* Ait.]

Family 4. **DIOSCOREACEAE** Lindl.

YAM FAMILY

Perennial herbaceous or somewhat woody vines, with ribbed and netted-veined petioled leaves and small inconspicuous dioecious or monoecious (in some exotic genera perfect) regular flowers. Perianth 6-parted, adherent in the pistillate flowers to the ovary. Staminate flowers with 6 or 3 stamens, sometimes with a rudimentary ovary. Pistillate flowers with an inferior 3-celled ovary, 3 styles and 3 terminal stigmas, sometimes also with 3 or 6 staminodia; ovules 2 or rarely one in each cavity of the ovary, pendulous, anatropous or amphitropous. Fruit a 3-valved, 3-angled capsule or samaroid. Endosperm of the seed fleshy or cartilaginous, enclosing the small embryo. About 9 genera and 175 species, mostly natives of America, a few in the Old World.

Fruit a 3-celled, 3-winged or 3-angled capsule.
Fruit a 1-seeded samara.

1. *Dioscorea*.
2. *Rajania*.

1. **DIOSCOREA** [Plum.] L. Sp. Pl. 1032. 1753.

Twining vines, mostly with large edible tuberous rootstocks, the stems occasionally armed with prickles near the base. Leaves alternate, opposite or whorled, often bearing bulbs in their axils. Flowers in axillary spikes, racemes or panicles. Fruit loculicidally 3-valved by splitting through the winged angles. Seeds flat, with a membranous wing. [Name in honor of the Greek Naturalist Dioscorides.] About 160 species, natives of tropical regions, a few in the temperate zones. Known as YAM and NAME. Type species: *Dioscorea sativa* L.

Leaf-blades entire.

Leaf-blades long-pilose on the veins beneath; leaves alternate; stems slender, terete, unarmed.

1. *D. pilosiuscula*.

Leaf-blades glabrous.

Perfect stamens 3; leaves alternate; stems terete or nearly so, unarmed.

2. *D. polygonoides*.

Perfect stamens 6.

Leaves mostly opposite.

Stems acutely 4-angled or 4-winged; rachis of the staminate inflorescence flexuous.

3. *D. alata*.

Stems terete or nearly so, sometimes armed with small sharp prickles; rachis of the staminate inflorescence straight.

4. *D. cayennensis*.

Leaves mostly alternate; stems sharply angled, armed with large flat prickles; staminate spikes simple.

5. *D. altissima*.

Leaf-blades 3-6-lobed; leaves alternate; stem 4-angled or 4-winged; perfect stamens 6.

6. *D. trifida*.

1. **Dioscorea pilosiuscula** Bertero; Spreng. Syst. 2: 152. 1825.

* *Helmia pilosiuscula* Kunth, Enum. 5: 434. 1850.

Dioscorea bulbifera Griseb. Fl. Br. W. I. 587. 1864. Not. L. 1753.

A rather slender vine, sometimes 15 m. long, the subcylindric stems glabrous or sparingly pilose, striate. Leaves alternate, often bearing bulbils in their axils, the blades ovate, 8-14 cm. long, 4-7.5 cm. broad, acuminate at the apex, cordate at the base, 7-11-nerved, the sinus broad; petioles 2.5-3.5 cm. long, pilose or glabrous; pistillate flowers in long simple spikes, the perianth-segments oblong or elliptic, 1.5 mm. long; capsule oblong-elliptic, 2 cm. long, 1 cm. broad; seeds about 8 mm. long, winged at the base.

Thickets and hillsides, Porto Rico; St. Thomas; St. Jan; Tortola;—Jamaica (according to Grisebach), Hispaniola; Antigua to Tobago; Guiana. DUNGUEY.

2. *Dioscorea polygonoides* H. & B.; Willd. Sp. Pl. 4: 795. 1805.

Dioscorea polygonoides scorpioides Uline; R. Knuth, Notizblatt 7: 208. 1917.

A glabrous vine with slender subterete stems. Leaves alternate, ovate to ovate-oval, 6–15 cm. long, 5–12 cm. broad, long-acuminate at the apex, deeply cordate at the base, 7–11-nerved, punctate with pellucid lines; staminate flowers interruptedly spicate, single or glomerate, the spike simple or sparingly branched; bracts linear or linear-lanceolate, 2–3 mm. long; perianth-segments ovate or elliptic, about 1.5 mm. long, 1 mm. wide, obtuse or acutish; perfect stamens 3; sterile stamens 3; pistillate flowers in simple or slightly compound racemes; capsule oblong-oval or oval, 2.5–3 cm. long, 2–2.7 cm. broad chartaceous; seeds surrounded by a wing. [*D. alata* of Bello, not of Linnaeus; *D. multiflora* of Cook and Collins.]

Thickets and hillsides, Porto Rico:—Hispaniola; Antigua to Trinidad; continental tropical America. GUNDA. HICAMO. MATA GALLINA.

3. *Dioscorea alata* L. Sp. Pl. 1033. 1753.

Rajania flexuosa Bello, Anal. Soc. Esp. Hist. Nat. 12: 124. 1883.

A glabrous vine, the stems 4-angled or 4-winged. Leaves usually opposite, the blades hastate-ovate to broadly ovate or suborbicular, 7–20 cm. long, 4–12 cm. broad, acuminate at the apex, often deeply cordate at the base, 5–7-nerved, membranous; petioles rather slender, 5–14 cm. long, often winged; staminate flowers in whorled, often paniced spikes, the rachis flexuous; perianth-segments about 1 mm. long, the outer oval to orbicular, the inner somewhat obovate; fertile stamens 6; pistillate flowers distant in simple spikes, hypanthium glabrous; capsule coriaceous, glabrous, broader than long, with 3 large wings, 2.2–3 cm. in diameter; seeds orbicular, broadly winged all around.

Spontaneous after cultivation: Porto Rico; St. Thomas; St. Jan; Tortola; St. Croix:—Bahamas; Cuba; Jamaica; Hispaniola; Saba to Trinidad; northern South America. Generally cultivated in tropical and subtropical countries. Probably native of southern Asia. WHITE YAM. WATER YAM.

4. *Dioscorea cayennensis* Lam. Encyc. 3: 233. 1789.

A glabrous vine, the stems terete or nearly so, often armed below with small sharp prickles. Leaves mostly opposite, the blades usually cordate-hastate, 6–14 cm. long, 5–10 cm. broad, rather abruptly long-acuminate at the apex, 7–9 nerved, punctate with pellucid lines; petioles 4.5–9 cm. long; staminate flowers spicate; bracts triangular-ovate, acuminate, about 1 mm. long; outer perianth-segments oval, 2–2.5 mm. long, 1.2–1.5 mm. broad, the inner slightly smaller; perfect stamens 6; pistillate flowers in simple spikes; capsule elliptic-oblong, coriaceous; seeds winged at the base.

Spontaneous after cultivation in Porto Rico:—Jamaica; Guadeloupe; St. Lucia; Grenada; Tobago; Trinidad. NAME DE GUINEA. GUINEA YAM. YELLOW YAM.

Dioscorea rotundata Poir. [*D. cayennensis rotundata* Griseb.], WHITE GUINEA YAM, originally described from (probably cultivated) Porto Rican specimens, is very similar to the preceding. It differs, however, in the cordate leaf-blades which have rounded lobes, and in a usually more simple inflorescence.

5. *Dioscorea altissima* Lam. Encyc. 3: 231. 1789.

Dioscorea chondrocarpa Griseb. in Mart. Fl. Bras. 3¹: 34. 1842.

A large vine, the brownish stems sharply angled below and often more or less winged, armed with large flat prickles. Leaves usually alternate, rarely subopposite, the blades ovate to orbicular, 8–15 cm. long, 7–16 cm. broad, acuminate at the apex, cordate at the base, 7–9-nerved, punctate beneath with pellucid lines and dots; petioles 5–7.5 cm. long, occasionally armed with small

scattered prickles; staminate spikes "simple, the perianth-segments oblong, obtuse"; pistillate flowers in long simple spikes, the perianth-segments oblong, 1.5-2 mm. long.

Spontaneous after cultivation; Porto Rico:—Cuba; Guadeloupe; Martinique; St. Vincent; Tobago; Brazil. DUNGUEY.

6. *Dioscorea trifida* L. f. Suppl. 427. 1781.

A pubescent vine, the stems 4-angled or 4-winged. Leaves alternate, 9-20 cm. long, 8-19 cm. broad, 3-5-lobed, often short-pilose on the veins beneath, punctate with pellucid lines, 9-11-nerved, the lobes ovate-lanceolate to elliptic or oval, acuminate; petioles 5-12 cm. long; staminate flowers in long slender, sometimes whorled, paniced spikes, the branches pilose, the lanceolate bracts about 2 mm. long, acuminate; perianth-segments oblong, 2.5-3 mm. long; stamens 6, all perfect, the filaments longer than the anthers; pistillate flowers in long slender simple racemes, the rachis often pilose; hypanthium pilose, the perianth-segments oblong to oblong-lanceolate; capsule oblong-elliptic, 2.5-3.4 cm. long, 1.4-1.6 cm. broad, coriaceous.

Spontaneous after cultivation in Porto Rico:—Jamaica; Guadeloupe; Martinique; St. Vincent, Tobago and Trinidad. Native of South America. MAPUEY. CUSH-CUSH YAM. INDIAN YAM.

Dioscorea esculenta (Lour.) Prain, POTATO YAM, is cultivated in Porto Rico for food. It is a rather large vine, the broadly ovate, glabrous alternate, 9-13-nerved leaves are cordate at the base, acuminate at the apex, the stems terete, the staminate spikes fasciculate-paniculate, the pistillate simple. [*Oncus esculentus* Lour; *D. sativa* of Kunth, not of Linnaeus.]

Dioscorea latifolia Benth., AKAM, of west tropical Africa, is sometimes planted in Porto Rico and has been confused with *D. sativa* L. The alternate, long-petioled, glabrous, 7-9-nerved leaves are cordate at the base, the staminate spikes about as long as the leaves, the stamens shorter than the narrow perianth-lobes, the rudimentary ovary small, the pistillate spikes sometimes 20 cm. long or more.

Dioscorea sagittata Poir, native of Guiana, is recorded as formerly observed on St. Thomas by Krebs.

2. **RAJANIA** L. Sp. Pl. 1032. 1753.

Twining vines, with alternate petioled leaves, and small greenish dioecious racemose flowers, the staminate ones commonly clustered in the racemes, the pistillate solitary. Staminate flowers with a 6-cleft perianth and 6 stamens with short filaments, the pistil rudimentary or none. Pistillate flowers with 6 distinct perianth-segments, the styles 2-cleft; staminodia minute or wanting. Fruit samaroid, 1-seeded, indehiscent, the wing terminal. Commemorates John Ray, 1628-1705, famous English botanist.] Twenty species or more, natives of the West Indies, Central and South America. Type species: *Rajania hastata* L.

1. *Rajania cordata* L. Sp. Pl. 1032. 1753.

Rajania pleioneura Griseb. Fl. Br. W. I. 588. 1864.

Rajania Sintenisii Uline: Urban, Symb. Ant. 3: 281. 1902.

Rajania venosa R. Knuth, Notizblatt 7: 219. 1917.

Rajania cordata microcarpa Uline; R. Knuth, Notizblatt 7: 219. 1917.

Rajania cordata cymulifera Uline; R. Knuth, Notizblatt 7: 220. 1917.

A vine, 3-9 m. long or longer, with slender glabrous branches. Leaves alternate, chartaceous, oblong-ovate, triangular-ovate or broadly ovate, 4-19

cm. long, 2–11.5 cm. broad, acute to long-acuminate at the apex, cordate or subcordate at the base, glabrous on both sides, 7–9 nerved, the petioles 1–5 cm. long; staminate inflorescence 6–30 cm. long, its branches slender, glabrous or slightly pubescent; perianth-segments oblong, 1 mm. long or less; pistillate inflorescence 7–30 cm. long, usually glabrous; samara narrowly to broadly semiobovate-oblong, 1–2.6 cm. long, its wing thin and lustrous.

Thickets, woodlands and mountain forests ascending to higher elevations in moist districts, Porto Rico; Vieques; St. Croix; St. Thomas;—Cuba; Jamaica; Guadeloupe; Dominica; Martinique; Trinidad. GUAYARO. BEJUCO DE GUARAGUAO. NAME GULUMBO. GUNDA.

Family 5. HAEMODORACEAE R. Br.

BLOODWORT FAMILY

Perennial herbs with erect stems, narrowly or broadly linear leaves, and regular or somewhat irregular perfect flowers. Perianth 6-parted or 6-lobed, persistent. Stamens 3. Ovary inferior or superior, 3-celled; ovules few or numerous in each cavity; styles mostly slender; stigma small, entire or 3-grooved. Fruit a loculicidally 3-valved capsule. Seeds few or numerous; embryo small in fleshy endosperm. About 9 genera and 35 species, mostly natives of South Africa and Australia, a few in tropical America and the north temperate zone.

1. *XIPHIDIUM* Aubl. Pl. Guian. 1: 33. 1775.

Rather stout stoloniferous herbs, with creeping rootstocks and broadly linear equitant leaves. Perianth 6-parted. Stamens opposite the 3 inner perianth-segments; filaments short; anthers erect. Ovary superior; ovules numerous in each cavity. Capsule globose; seeds numerous. (Greek, a little sword.) Two or three species, natives of the West Indies and tropical America. Type species: *Xiphidium coeruleum* Aubl.

1. *Xiphidium coeruleum* Aubl. Pl. Guian. 1: 33. 1775.

Xiphidium floribundum Sw. Prodr. 17. 1788.

Stems 2–6 dm. high. Leaves linear-lanceolate, 3.5–4 dm. long, 2–5 cm. wide, long-acuminate at the apex, glabrous, the margins often muricate; panicle 1–3 dm. high, the branches more or less villous; pedicels 2–5 mm. long; perianth-segments oblong-lanceolate, about 5 mm. long, 1.5–2 mm. broad, obtuse or acutish, glabrescent; capsule 5–6 mm. in diameter.

Moist shady places, Rosario, Porto Rico;—Cuba; Jamaica; St. Kitts to Trinidad; continental tropical America. Occasionally planted in Virgin Island flower gardens.

Family 6. IRIDACEAE Lindl.

IRIS FAMILY

Perennial herbs, with elongated or bulb-like rootstocks and equitant 2-ranked leaves. Flowers perfect, regular or irregular, solitary or in clusters from spathe-like bracts. Perianth of 6 segments or 6-lobed, the tube adnate to the ovary, the segments or lobes in 2 series, convolute in the bud, withering-persistent. Stamens 3, inserted on the perianth opposite the outer series of segments or lobes. Filaments distinct or partially united. Anthers 2-celled, extrorse. Ovary inferior, 3-celled. Ovules numerous, anatropous. Styles distinct, entire or parted, sometimes petal-like. Fruit a loculicidally 3-valved capsule. Seeds numerous in 1 or 2 rows in each cavity of the

capsule; embryo straight in fleshy or horny endosperm. About 57 genera and 800 or more species of wide distribution, in temperate and tropical regions of both hemispheres.

Caulесcent herbs, with short, stout rootstocks; style subulate, its branches flattened and emarginate.
 Acaulescent herbs, with coated bulbs; style very short, with three subulate branches.

1. *Belamcanda*.
2. *Galatea*.

1. **BELAMCANDA** Adans. Fam. Pl. 2: 60. 1763.

[*GEMMINGIA* Heister; Fabr. Enum. Pl. Hort. Helm. ed. 2. 27. 1763.]

Perennial caulescent herbs, with short stout rootstocks and alternate Iris-like leaves. Flowers in terminal small bracted clusters. Perianth mottled. Stamens 3; filaments distinct, adnate to the base of the perianth-segments; anthers linear-oblong. Ovary 3-celled. Style slender, the branches flattened. Capsule fig-shaped, loculicidally 3-valved to the base, the valves recurving, finally falling away, leaving the central column covered with the globose black and fleshy-coated seeds, resembling a blackberry. [The East Indian name.] A monotypic genus of eastern Asia.

1. **Belamcanda chinensis** (L.) DC. in Red. Lil. 3: pl. 121. 1807.

Ixia chinensis L. Sp. Pl. 36. 1753.

Pardanthus chinensis Ker in König & Sims, Ann. Bot. 1: 247. 1805.

Gemmingia chinensis Kuntze, Rev. Gen. Pl. 701. 1891.

Stems rather stout, 4.5–12 dm. tall or more. Leaves nearly erect, bright green, often more or less glaucescent, equitant, folded, 1.5–5 dm. long, the two sides united above the middle; bracts similar to the leaves but much shorter; flowers several or numerous; perianth 3–5 cm. broad, the segments nearly alike, oblong, obtuse at the apex, narrowed at the base, orange-yellow mottled with crimson-purple spots; capsule 2–2.5 cm. long; seeds shining.

Roadsides and open hillsides, naturalized in Porto Rico; following cultivation for ornament:—eastern United States; Cuba; Jamaica; Martinique. MARIPOSA. BLACKBERRY LILY.

2. **GALATEA** Salisb. Trans. Hort. Soc. 1: 310. 1812.

[*ELEUTHERINE* Herb. Bot. Reg. 29: pl. 57. 1843.]

Acaulescent herbs, with tunicated bulbs and lanceolate acuminate leaves. Inflorescence of several peduncled clusters, subtended at the base by a large leaf-like bract. Spathes several-flowered, about 1.5 cm. long. Perianth-tube none, the segments subequal, spreading. Filaments short, free. Anthers linear. Ovary 3-celled. Ovules many, superposed. Style very short, with 3 subulate branches stigmatic at the tip. Capsule loculicidally 3-valved. Seeds small, angled by pressure. [Greek, a sea-nymph.] Two known species, natives of tropical America. Type species: *Galatea vespertina* Salisb.

1. **Galatea bulbosa** (Mill.) Britton, Mem. Brooklyn Bot. Gard. 1: 37. 1918.

Sisyrrinchium bulbosum Mill. Gard. Dict. ed. 8. No. 3. 1768.

Sisyrrinchium palmifolium Cav. Diss 6: 348. 1788. Not. L. 1767.

Eleutherine plicata Herb.; Klatt, in Mart. Fl. Bras. 3^a: 514. 1871.

Cipura plicata Griseb. Fl. Br. W. I. 589. 1864.

Eleutherine bulbosa Urban, Repert. 15: 305. 1918.

Bulb ovoid, 3 cm. or more in diameter, with rather hard red-brown coats. Leaves 1 or 2, basal, linear-lanceolate, 1.4–4.5 dm. long, the slender scape up to

3.5 dm. tall; spathes oblong, 1.5 cm. long, or less; flowers slender-pedicelled; perianth white, 2–2.5 cm. broad; the segments obovate, spreading; style-branches as long as the anthers; filaments short; anthers linear; capsule about 2 cm. long.

Roadsides and fields, Porto Rico; St. Thomas; St. Jan; St. Croix.—Cuba; Jamaica; Hispaniola to Grenada; South America.

Order 10. SCITAMINALES.

Herbs, often large and perennial, or sometimes arborescent. Flowers very irregular. Ovary inferior, composed of several united carpels. Fruit a capsule or utricle. Seeds with endosperm.

Pollen-bearing stamens 5.

Pollen-bearing stamen 1.

Ovules many in each cavity of the ovary.

Anthers 1-celled.

Anthers 2-celled.

Ovule solitary in each cavity of the ovary.

Fam. 1. MUSACEAE.

Fam. 2. CANNACEAE.

Fam. 3. ALPINIACEAE.

Fam. 4. MARANTACEAE.

Family 1. MUSACEAE J. St. Hill.

BANANA FAMILY.

Caulescent or occasionally acaulescent, often stoloniferous perennial herbs, with subarborescent stems composed of convolute leaf-sheaths, or sometimes arborescent. Leaves distichous or spiral, the blades large, pinnately parallel-veined. Inflorescence simple, bracteate, forming a dense spiral spike, or compound and forming a loose distichous panicle. Flowers perfect or unisexual. Corolla a convex membranous petal placed opposite the slit in the calyx, or the 3 petals united into a tube 3-toothed at the apex, or free. Calyx-tube slit down one side to the base, 3–5-toothed at the apex, or of 3 equal sepals, all free, or one free and the other two more or less adnate to the base of the corolla. Ovary 3-celled, the ovules solitary or often several in each cell, anatropous, erect or horizontal; style simple; stigma simple or lobed. Fruit indehiscent, pulpy or dry, or capsular and dehiscent. Seeds with or without an aril. Embryo short. The family contains 6 genera and about 80 species of wide geographic distribution.

Flowers perfect; ovule solitary in each cell of the ovary.

1. *Bihai*.

Flowers unisexual, the lower female, the upper male; ovules many in each cell of the ovary.

2. *Musa*.

1. *BIHAI* Adans. Fam. Pl. 525. 1753.

[*HELICONIA* L. Mant. 2: 147. 1771.]

Herbs, the inflorescence terminal, erect or recurved-pendulous. Flowers perfect, glomerate or fascicled in the axils of distichous bracts. Sepals 3, lanceolate, equal, one free, the two others more or less adnate at the base to the corolla. Petals united into a tube, 3-toothed at the apex. Perfect stamens 5; filaments short; anthers linear, the sixth stamen represented by a small petaloid staminodium. Ovary inferior, 3-celled; ovules solitary, erect; style filiform; stigma capitate. Capsule drupaceous, often blue. [An aboriginal name.] Thirty or more species, native of tropical America. Type species: *Musa Bihai* L.

1. *Bihai Bihai* (L.) Griggs, Bull. Torr. Club 31: 445. 1904.

Musa Bihai L. Sp. Pl. 1043. 1753.

Heliconia Bihai L. Mant. 2: 211. 1771.

Heliconia borinquena Griggs, Bull. Torr. Club 30: 658. 1903.

Bihai borinquena Griggs, Bull. Torr. Club 31: 445. 1904.

Plant 3–6 m. tall. Leaves long-petioled, the oblong or elliptic blade often 1 m. or more long, 2–3.5 dm. broad, abruptly short-acuminate at the apex, acute

or rounded at the base, glabrous, green, or glaucous beneath; inflorescence 4-6 dm. long; bracts deeply boat-shaped, acute to long-acuminate, 6-12 cm. long, overlapping each other at their bases, crimson with a yellow edge, yellow or scarlet; flowers greenish or greenish-yellow.

Moist hillside forests and damp ravines. Porto Rico; Tortola.—West Indies (except Bahamas); continental tropical America. Races differ in shape, size and color of the bracts. PAMPANO. PLATANO DE INDIO. WILD PLANTAIN.

2. *MUSA* L. Sp. Pl. 1043. 1753.

Herbs, often large and tree-like. Leaves usually very large. Flowers unisexual, in half whorl-like clusters in a terminal, erect or recurved-pendulous spike, the lower flowers female, the upper male; bracts large, spathaceous, colored. Calyx-tube slit down one side to the base, 3-5-toothed at the apex. Corolla a convex membranous petal placed opposite the slit in the calyx. Perfect stamens 5, the sixth rudimentary or none; filaments erect, free; anthers linear, erect, 2-celled. Ovary inferior, 3-celled; ovules many, superposed; style erect, filiform; stigma subglobose, 6-lobed. Fruit oblong or fusiform, indehiscent, usually fleshy, many-seeded when seed is produced; testa crustaceous; endosperm mealy; embryo small. [Named in honor of Antonio Musa, physician to Octavius Augustus, first Emperor of Rome.] Forty or more species, natives of tropical Asia, Africa, Australia and adjacent islands. Type species: *Musa paradisiaca* L.

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

Plant 6-10 m. tall, stoloniferous. Leaves petioled, the blade oblong, 12-20 dm. long, 3.5-6 dm. wide, usually rounded at the base, light green above, paler beneath; inflorescence recurved-pendulous, 10-15 dm. long; bracts mostly persistent, oblong-lanceolate or oblong-ovate, dull violet, more or less glaucous outside, the lower longer than the upper; flowers yellowish-white, 3-3.8 cm. long; calyx 5-toothed; free petal oval, half as long as the calyx; fruit cylindrical 1.5-3 dm. long, usually yellow or greenish-yellow when ripe, the pulp firm, eaten when cooked.

Persistent after cultivation in Porto Rico. Cultivated in all tropical countries, and the most important food-fruit in Porto Rico. Native of India, PLATANO. PLANTAIN.

Musa sapientum L. GUINEOS, EDIBLE BANANA, YELLOW BANANA, is sometimes regarded as a subspecies, or variety of the preceding, or as a species and *M. paradisiaca* L. a variety of it. There are many races of this in cultivation in tropical regions. Cook and Collins recorded over 40 named varieties of plantains and bananas under cultivation in Porto Rico.

Musa Cavendishii Lamb., DWARF BANANA, FIG BANANA, Asiatic, locally grown in Porto Rico, is usually not more than 2.5 m. high, with spreading leaves about 1 m. long, the numerous yellow fruits 1-1.5 dm. long.

Ravenela madagascariensis J. F. Gmelin, TRAVELERS' TREE, native of Madagascar, is occasionally planted for ornament in moist parts of Porto Rico. The unbranched trunk is rather stout up to 7 m. high; the large, long-petioled, distichous leaves arranged in a fan-like crown, the large flowers white, the fruit a loculicidally dehiscent capsule. The densely imbricated petiole-bases contain a watery sap which is drinkable.

Family 2. **CANNACEAE** Link.

CANNA FAMILY.

Erect caulescent herbs, with leafy stems. Flowers irregular, often showy, usually in a terminal raceme or panicle, occasionally spicate. Calyx of 3 erect, more or less imbricate, persistent sepals. Corolla of 3 partially united petals. Staminal tube connate below with the corolla tube, the segments petaloid, unequal, the exterior staminodes 2 or 3, rarely wanting, the interior staminodes 2, one of which bears a one-celled anther on its margin. Ovary inferior, 3-celled, the cells many-ovuled. Style flattened, adnate to the base of the staminal tube, free above. Fruit capsular, loculicidal, with a papillose or bristly coat. Seeds large, globose. Endosperm horny. Embryo straight. Only the following genus.

1. **CANNA** L. Sp. Pl. 1. 1753.

Characters of the family. [Latin, a cane or reed.] About 50 species, natives mostly of tropical and subtropical regions, known as MARACA and INDIAN SHOT. Type species: *Canna indica* L.

Flowers yellow.

1. *C. glauca*.

Flowers red.

Leaves not perforated.

Staminodia unequal; lip yellow spotted with red.

2. *C. coccinea*.

Staminodia subequal; entire corolla red.

3. *C. sylvestris*.

Leaves with foramina between the mid-vein and the margin.

4. *C. pertusa*.

1. **Canna glauca** L. Sp. Pl. 1. 1753.

Stem glaucous, 1-2 m. tall. Leaf-blades oblong-lanceolate, the lower 3.5-5 dm. long, 8-13 cm. wide at the middle, acuminate at the apex, gradually tapering to the base, glaucous; racemes lax, simple or forked; sepals lanceolate, 1.5-1.7 cm. long, glaucous; corolla-tube 1.5-2 cm. long, the linear-lanceolate segments erect, 4-4.5 cm. long, greenish-yellow; upper staminodia 3, pale yellow, unspotted, 6-7 cm. long, 1.4-2 cm. broad; lip narrowly obovate-oblong, pale yellow, emarginate; style linear; capsule ellipsoid or oval, 3.5-4.5 cm. long, about 2.5 cm. in diameter.

Marshy places and ditches, Porto Rico:—Bermuda; Cuba; Jamaica; Guadeloupe to Trinidad, South America; recorded from the Philippine Islands.

A glaucous *Canna*, perhaps a hybrid of *C. glauca* with some other species, was well established and abundant in the old moat at Fort Geronimo, near San Juan in 1922, but the moat had been filled up and the colony of plants destroyed in 1923.

2. **Canna coccinea** Mill. Gard. Dict. ed. 8. 1768.

Canna coccinea bicolor Kranzl., Pflanzenreich 4⁷: 61. 1912.

Stem slender, green, 1.5-2 m. tall. Leaf-blades oblong-lanceolate to oblong-ovate, 2.5-5 dm. long, 8-16 cm. broad, acuminate at the apex, acute at the base; racemes mostly simple; sepals oblong-lanceolate, 1.2-1.5 cm. long, tinged with red; corolla-tube short, the segments lanceolate, 3.2-3.8 cm. long, tinged with red; upper staminodia unequal, two of them oblong-spatulate, emarginate at the apex, rarely entire, the third one much smaller, linear-lanceolate; lip red-yellow, distinctly emarginate; capsule 2-3 cm. long, 1.5-2 cm. in diameter.

Fields, banks and borders of woods, Porto Rico, ascending to 800 m.; St. Thomas:—West Indies (except Bahamas); Central and South America.

3. *Canna sylvestris* Rose. Monandr. Pl. 10. 1828.

Canna coccinea sylvestris Regel, Ind. Sem. Hort. Petrop. 85. 1866.

Canna portoricensis P.C. Bouche, Linnaea 12: 147. 1838.

Stems erect, green, about 2 m. tall. Leaf-blade: oblong-lanceolate or elliptic, up to 7 dm. long and 2.5 dm. broad; racemes slender, usually branched; sepals lanceolate, 0.9–1 cm. long, tinged with red; perianth-segments lanceolate, 4 cm. long, acuminate at the apex; staminodia 3, equal or nearly so; lip revolute; capsule ellipsoid, 3.5–4 cm. long, 1.8 cm. in diameter.

Banks of stream, Porto Rico:—Jamaica; Panama.

4. *Canna pertusa* Urban, Repert. 15: 101. 1917.

Plant 3 m. tall, with glabrous stems. Leaf-blades oval, about 3.5 dm. long, 2 dm. broad, short-acuminate at the apex, rounded at the base, pale green, glabrous above, cobwebby-pubescent on the midvein beneath, at least some of them with oblong perforations between the margin and midrib; inflorescence paniculate, about 2.5 dm. long; bracts cobwebby-pubescent; ovary oblong-ellipsoid or obovoid-oblong, densely papillose; sepals lanceolate, 5–6 mm. long, obtuse at the apex; corolla-tube short, the segments 3.5 cm. long, 7–8 mm. broad, erect; staminodia 3, united to above the middle; lip lanceolate, punctate above; capsule oval-ellipsoid or ellipsoid, 4.5–5.5 cm. long, about 2.5 cm. in diameter, echinate.

Banks and along streams, in the central and western mountains of Porto Rico. Endemic.

Canna lutea Mill., of continental tropical America, has escaped in gardens on St. Croix, according to Millspaugh. It is a medium-sized herb, the slender green stems sometimes a meter or more high, the broad lanceolate or oblong leaves acute, the oblong sepals white-margined, the lanceolate petals yellowish white, 2.5 cm. long, the pale yellow staminodia often emarginate, 3.5–5 cm. long, the linear lip pale yellow.

Canna edulis Ker., West Indian and South American, is recorded by Eggers as naturalized and cultivated along rivulets in the Virgin Islands. It is a tall herb, the stout purplish stems sometimes 3 m. high, the oblong or ovate-oblong green or bronze leaves 6 dm. or more long, the oblong-lanceolate sepals, 2 cm. long, the narrowly lanceolate petals up to 4 cm. long, the bright red or orange staminodia entire or emarginate, 5 cm. or more long, the lip bright red or yellowish red, the rootstock edible, thick.

Canna Lambertii Lindl., native of the West Indies and South America, is recorded by Eggers as cultivated in the Virgin Islands, and by Millspaugh as naturalized on St. Croix. It is a tall herb, the rather stout stems green, the oblong-lanceolate or elliptic leaves acute, the lanceolate, pale purple or lilac sepals about 1 or 1.2 cm. long, the lanceolate purple petals 3.5 cm. long, the obovate, bright crimson staminodia connate at the base, the lip crimson-purple.

Canna indica L., of the West Indies and continental tropical America, is recorded by Krebs as found in St. Thomas and by Eggers as found in moist places and near dwellings in the Virgin Islands; the records probably apply to *C. coccinea* Mill.

Selected cannas are grown in Porto Rican gardens with moderate success.

Family 3. **ALPINIACEAE** Link.

GINGER FAMILY.

Mostly perennial aromatic herbs, often large, with cauline or basal leaves, the blades pinnately veined. Inflorescence terminating a leafy stem, or on a leafless scape arising from the base of the sterile shoot. Flowers

bracteate and often bracteolate, solitary, spicate, racemose or panicle, irregular, perfect. Calyx superior, tubular or spathaceous, often 3-lobed. Corolla funnelform, 3-lobed. Lateral staminodia petaloid, tooth-like or none. Lip often large, 2- or 3-lobed. Stamen 1; filament short or long; anther 2-celled, the cells longitudinally dehiscent. Style filiform; stigma funnelform, the apex often ciliate. Ovary 3-celled, rarely 1- or 2-celled; ovules anatropous. Fruit capsular, more or less fleshy, tardily dehiscent. Style filiform; stigma funnelform, the apex often ciliate. Ovary 3-celled, rarely 1- or 2-celled; ovules anatropous. Fruit capsular, more or less fleshy. Seeds ellipsoid; embryo straight, cylindric or clavate. About 38 genera and over 800 species, of wide tropical distribution.

Inflorescence lax-flowered, racemose, raceme-like or paniculate; lateral staminodia rudimentary.

Lip horizontal or declined, sessile or short-clawed.

Lip erect, long-clawed.

1. *Languas*.

2. *Alpinia*.

Inflorescence dense, spike-like, often cone-like.

Lateral staminodia rudimentary.

Spikes terminating leafless scapes; filament short; connective usually produced into a long appendage.

3. *Zingiber*.

Spikes terminating leafy stems; filament petaloid, the anther adnate to its middle.

4. *Costus*.

Lateral staminodia large and petal-like.

Staminodia united below with the petal-like filament.

5. *Curcuma*.

Staminodia distinct or nearly so; filament slender, not petal-like.

6. *Hedychium*.

1. *LANGUAS* Koenig in Retz, Obs. 3: 64. 1783.

Herbs with stout rootstocks, and often tall leafy stems. Flowers mostly in terminal panicles or racemes. Calyx loosely tubular or subcampanulate, 3-toothed. Corolla-tube cylindric, about as long as the calyx, the lobes spreading. Lateral staminodia small; lip large, spreading; filament broad; anther-cells linear, separated by a broad or narrow connective. Ovary 3-celled; ovules few or many in each cell; style filiform; stigma subglobose. Fruit subglobose, many-seeded. Seeds globose or angled, with a fleshy or spongy aril. [Malayan name.] About 135 species, natives of southeastern Asia, the East Indian Islands, New Guinea and Polynesia. Type species: *Languas vulgare* Koenig.

1. *Languas speciosa* (Wendl.) Small, Fl. SE. U. S. 307, 1375. 1913.

Zerumbet speciosum Wendl. Sert. Hann. 4: 3. 1798.

Globba nutans Redoute, Liliac. 1: pl. 60. 1802. Not. L. 1771.

Renealmia nutans Andr. Bot. Rep. 5: pl. 360. 1802-3.

Alpinia nutans Rose.; Smith. Exot. Fl. 2: 93. 1805.

Alpinia speciosa K. Schum. Fl. Kaiser-Wilhelmsl. 29. 1887.

A robust herb with leafy stems 2-3 m. or more high and showy orchid-like flowers. Leaves oblong to oblong-lanceolate, 3-7 dm. long, 6-14 cm. broad, petioled or subsessile, the margin usually conspicuously ciliate; ligule coriaceous, about 1 cm. long, obtuse, often densely pubescent with appressed brownish hairs; panicle raceme-like, nodding; rachis stout, often densely pubescent; bracts 2-2.8 cm. long, enveloping the buds, deciduous; calyx subcampanulate, 1.8-2.5 cm. long, lobed; corolla-tube shorter than the calyx, the oblong-elliptic segments 2.5-3 cm. long, white, tipped with pink; lip ovate, 3.5-4 cm. long, the margins pale, incurved, the center variegated with red and yellow; filament linear; lateral staminodia subulate, 2 mm. long; capsule subglobose, 2 cm. in diameter.

Persistent after cultivation in Porto Rico:—southern Florida; Bermuda; Cuba; Hispaniola; Montserrat; Guadeloupe. Commonly planted for ornament in Porto Rico and the Virgin Islands. Native of the islands of eastern Asia. DRAGON. BOCA DE DRAGON. SHELL-PLANT. SHELL-FLOWER.

2. **ALPINIA** L. Sp. Pl. 2. 1753.[*RENEALMIA* L.f. Suppl. 7. 1781. Not L., 1753.]

Perennial aromatic herbs with fleshy rootstocks. Inflorescence paniculate or racemose, terminating a leafy stem, or borne on a lateral scape arising from the base of the sterile shoot. Calyx coriaceous, narrowly or broadly funnel-shaped, 3-toothed at the apex. Corolla-tube often shorter than the calyx, the lobes subequal or longer, rarely shorter. Lip more or less 3-lobed. Lateral staminodia rudimentary. Anther 2-celled, sessile or with a short filament. Capsule globose or ellipsoid, rather fleshy, finally dehiscent irregularly. Seeds few, arillate. [Commemorates Prosper Alpino, 1553-1617, an Italian botanist] About 50 species, of tropical distribution. Type species: *Alpinia racemosa* L.

Inflorescence terminating a leafy stem; corolla white. 1. *A. antillarum*.
 Inflorescence terminating a leafless scape arising from the base of the sterile shoot; corolla yellow.
 Stems rather slender; calyx 5-6 mm. long; capsule 8-9 mm. in diameter.
 Stems robust; calyx 1.5-1.8 cm. long; capsule 1.4-1.8 cm. broad. 2. *A. aromatica*.
 3. *A. exaltata*.

1. **Alpinia antillarum** R. & S. Syst. 1: 20. 1817.*Alpinia racemosa* Sw. Obs. 5. 1791. Not L., 1753.*Renalmia racemosa* Rosc.; Griseb. Fl. Br. W. I. 601. 1864. Not A. Rich. 1850.*Renalmia antillarum* Gagnepain, Bull. Soc. Bot. France IV. 3: 200. 1903.*Renalmia antillarum puberula* Gagnepain, loc. cit. 203. 1903.

Stems 1.5-2 m. high, occasionally taller. Leaves narrowly lanceolate, 1-3 dm. long, 3.5-7.5 cm. broad, acuminate at the apex, acute at the base, glabrous, short-petioled or sessile; inflorescence 6.5 cm. long, erect, terminating a leafy stem, with one or more sterile bracts at the base, usually exceeded by the uppermost leaves; rachis, bracts and pedicels crimson; flowering bracts lanceolate, 3.5-4 cm. long; bracteoles broadly funnelform; pedicels slender, 5-12 mm. long; ovary globose, glabrous; calyx crimson, 7 mm. long, 3-toothed, the teeth obtuse; corolla white, the tube 11-12 mm. long, the lip 3-lobed; capsule subglobose, 7-8 mm. or more in diameter; seeds angled, 2-2.5 mm. in diameter, brown, shining. [*Renalmia bracteosa* of Bello, not of Grisebach.]

Shaded hillsides, moist mountain woodlands and river valleys, ascending to the higher elevations, Porto Rico:—Jamaica; Hispaniola.

2. **Alpinia aromatica** Aubl. Pl. Guian. 1: 3. 1775.*Alpinia occidentalis* Sw. Prodr. 11. 1788.*Renalmia occidentalis* Sweet, Hort. Brit. Ed. 2, 493. 1830.*Renalmia aromatica* Griseb. Fl. Br. W. I. 601. 1864.*Ethanium aromatica* Kuntze, Rev. Gen. Pl. 689. 1891.*Ethanium jamaicense* Kuntze, loc. cit. 1891.

Stems 2-2.5 m. tall. Leaves sessile or subsessile, narrowly oblong-lanceolate to lanceolate, 2-5 dm. long, 4-12 cm. broad, acuminate at the apex, acute at the base, glabrous, sessile or nearly so; inflorescence 1-3 dm. long, terminating a leafless scape about 6 dm. long, arising from the base of the stem; rachis more or less hirsute; scape 4-12 dm. long, the membranous sheaths 9-15 cm. long; lower bracts 3-6 cm. long, occasionally longer, the upper ones smaller; bracteoles funnelform; pedicels 4 mm. or more long; ovary subglobose, pilose or subglabrous; calyx 5-6 mm. long, scarlet; corolla yellow; capsule subglobose or ellipsoid, deep red, 8-9 mm. in diameter; seeds angled, 3 mm. in diameter, light gray, shining. [*Amomum sylvestre* of West, and of Krebs, not of Swartz, *Renalmia sylvestris* of Eggers.]

Damp shaded hillsides, woods and ravines, Porto Rico; Vieques; St. Thomas; St. Croix; Tortola:—Cuba and Jamaica to St. Vincent; continental tropical America. BIJAO. NARCISO.

3. *Alpinia exaltata* (L.f.) R. & S. Syst. 1: 21. 1817.*Renalmia exaltata* L.f. Suppl. 79. 1781.*Ethanium exaltatum* Kuntze, Rev. Gen. 2: 689. 1891.*Renalmia exaltata gracilis* K. Schum. in Urban, Symb. Ant. 4: 158. 1903.

Stem robust, up to 4 m. high. Leaves lanceolate or oblanceolate, 3.5–9 dm. long, 8–18 cm. broad, acuminate at the apex, acute at the base, sessile or short-petioled, glabrous; inflorescence terminating a leafless scape arising from the base of the stem; rachis, peduncles, pedicels, bracts and bracteoles more or less hirsute; bracts linear-lanceolate 4–8 cm. long, membranous; bracteoles 1.5 cm. long; calyx red, 1.5–1.8 cm. long, appressed-pubescent; corolla yellow, the lobes oblong, 8–10 mm. long, the lip somewhat lobed; capsule ellipsoid, 2.3–3 cm. long, purplish-black; seeds 3–4 mm. in diameter, angled.

In damp ravines, moist shaded forests and banks of streams Porto Rico:—Lesser Antilles; northern South America.

Urban records *Renalmia bracteosa* Griseb. (of the Lesser Antilles) from Porto Rico, but Stahl's number 685, on which this record is based has been referred by Schumann in his monograph of Zingiberaceae (Pflanzenreich 4¹⁶: 296. 1904) to *Renalmia exaltata* L.f. The species are very doubtfully distinct.

3. **ZINGIBER** Adans. Fam. Pl. 2: 66. 1763.

Leafy-stemmed herbs with horizontal aromatic branching rootstocks. Leaves distichous; petioles sheathing. Spikes usually radical. Bracts persistent, usually 1-flowered. Calyx-tube cylindric, shortly 3-lobed. Corolla-tube cylindric, slender, the segments lanceolate, the upper concave. Lateral staminodia none, or adnate to the lip; lip cuneiform or oblong, entire or 3-lobed; filament short; anther-sacs contiguous, parallel, the connective ending in a long erect slender incurved beak as long as the sacs. Ovary 3-celled, the cells many-ovuled; style filiform; stigma small, ciliate. Capsule subglobose or ellipsoid, at length dehiscent. Seeds globose, arillate. [The Latin or Greek name.] About 55 species, natives mostly of the Old World tropics. Type species: *Amomum Zingiber* L.

Bracts of the inflorescence green.

Leaves mostly 1.5–2.5 cm. broad; lip purple with yellow dots.

Leaves mostly 4–6 cm. broad; lip yellow.

Bracts of the inflorescence bright red or reddish-green.

1. *Z. Zingiber*.

2. *Z. Zerumbet*.

3. *Z. cassumunar*.

1. **Zingiber Zingiber** (L.) Karst. Deutsche Fl. 471. 1881.*Amomum Zingiber* L. Sp. Pl. 1. 1753.*Zingiber officinale* Rosc. Trans. Linn. Soc. 8: 348. 1807.

Stems 6–9 dm. high. Leaves linear-lanceolate or lanceolate, 18–28 cm. long, 1.2–2.5 cm. broad, sessile, gradually tapering to an acuminate apex, narrowing to the base; peduncles 15–25 cm. long; spikes ellipsoid, 4–6 cm. long; bracts suborbicular or somewhat obovate, 2–2.5 cm. long, greenish, the margin often yellow; calyx 0.8–1 cm. long; corolla yellowish green, the tube about 2 cm. long, the lobes lanceolate, subequal, acute; lip oblong-ovate, shorter than the corolla-lobes, purple with yellow spots; lateral lobes ovate, about 6 mm. long; filament dark purple, as long as the lip.

Spontaneous after cultivation, St. Thomas; St. Croix:—widely cultivated and more or less spontaneous in the West Indies, tropical continental America and Old World tropics. Native of the Old World. JENGIBRE DULCE. GINGER.

2. **Zingiber Zerumbet** (L.) Rosc.: Smith. Exot. Bot. 2: 105. 1806.

Anomum Zerumbet L. Sp. Pl. 1. 1753.

Stem 4–10 dm. high or higher. Leaves oblong-lanceolate or oblanceolate, 1.3–2.8 dm. long, 4.5–7 cm. broad, sessile, acuminate at the apex, narrowed at the base; peduncle 20–45 cm. long; spike ellipsoid, 6–10 cm. long, 4–5 cm. broad, obtuse; bracts broadly ovate to orbicular, 2.5–3.5 cm. long, closely imbricate, obtuse, green with a pale edge, the margin pubescent; corolla-tube slender, 2–2.5 cm. long, the lobes ovate-lanceolate, acuminate, white; lip 3-fid, shorter than the corolla-segments; anther glabrous; style glabrous; stigma funnel-shaped, the mouth ciliate; fruit ellipsoid, about 2.5 cm. long. [*Costus glabratus* of Bello, not of Swartz.]

Spontaneous after cultivation in Porto Rico:—cultivated in all tropical regions Native of the Old World. JENGIBRE AMARGO. BITTER GINGER.

3. **Zingiber cassumunar** Roxb. Asiat. Res. 11: 348. 1810.

Stems 1–2 m. high. Leaves oblong-lanceolate, 2.5–4 dm. long, 4–6.5 cm. broad, acuminate at the apex, somewhat rounded at the base, glabrous above, pubescent beneath; peduncle 12–20 cm. long; spike 8–15 cm. long, 4–5 cm. in diameter; bracts ovate, bright red or reddish-green, 3–3.5 cm. long; calyx-tube about 2 cm. long; corolla-tube slender, about as long as the bracts, the lobes lanceolate, about 2.2 cm. long, whitish; lip suborbicular, 2.5 cm. broad, retuse or 2-lobed, the margins erose and wrinkled; anther large, yellow; style glabrous; stigma obconic, ciliate; capsule subglobose, about 2 cm. long, membranous. [*Costus spicatus* of Bello, not of Swartz.]

Naturalized after cultivation in Porto Rico:—Cuba; Hispaniola. Native of eastern India and Malaysia.

4. **COSTUS** L. Sp. Pl. 2. 1753.

Perennial tropical herbs with leafy stems, rarely acaulescent. Inflorescence dense, often cone-like. Calyx-tube short. Corolla-tube equalling or longer than the calyx, the segments subequal. Lateral staminodia wanting or minute. Lip large. Filament petaloid, the anther adnate to its middle. Ovary 3-celled; ovules many, superposed; style filiform; stigma more or less ciliate. Capsule globose, ovoid or obovoid, finally dehiscent between the ribs. Seeds angled. [The ancient Greek name.] About 100 species of wide tropical distribution. Type species: *Costus arabicus* L.

Bracts red, unappendaged, 2.5–3.8 cm. long; lip 4–5 cm. long, entire. 1. *C. cylindricus*.
Bracts green, appendaged, 7 cm. long; lip 8 cm. long, 3-lobed. 2. *C. macrostobilus*.

1. **Costus cylindricus** Jacq. Fragm. Bot. 54. 1809.

Stems 1–4 m. high. Leaf-blades narrowly to broadly oblanceolate, 15–27 cm. long, 4–11 cm. broad, acuminate at the apex, acutish or rounded at the base, glabrous or somewhat pilose beneath, subsessile or short-petioled; spikes cylindric, 7–20 cm. long, 4–6 cm. in diameter, the broadly ovate, oval or suborbicular, rigid-coriaceous bracts red, striate, 2.5–3.8 cm. long, 2.3–3.2 cm. broad, obtuse or somewhat acutish, glabrous, or the lower ones appressed-pubescent; bracteoles lanceolate, 1.8–3 cm. long, complicate; ovary glabrous, 5–7 mm. long; calyx 9–12 mm. long, glabrous or short-pilose, red; corolla yellow, the tube 1 cm. or more long; lobes lanceolate, acute, membranous; lip yellow, 4–5 cm. long, entire; filament lanceolate, 3–4 cm. long; capsule triangular, 1.5 cm. long; seeds angled, 3–3.5 mm. long.

In damp shaded valleys, Porto Rico:—Hispaniola; Guadeloupe to Trinidad; also in South America.

2. **Costus macrostrobilus** K. Schum.; Urban, Symb. Ant. 4: 159. 1903.

Stem robust, 4 m. high. Leaf-blades oblanceolate or somewhat lanceolate, 30–40 cm. long, 10–14 cm. broad, acuminate at the apex, narrowed or rounded at the base, puberulent and scabrous on both surfaces; spikes dense, 15 cm. long; bracts green, oblong, 7 cm. long, acute, glabrous; ovary pubescent; calyx glabrous, 1 cm. long; corolla white, the tube 2 cm. long, the oblong lobes 5.5 cm. long, membranaceous, obtuse; lip 8 cm. long, 3-lobed, the middle lobe short, lacerate, the lateral ones obtuse.

Mountain woodlands, Porto Rico:—Trinidad. CANA DE INDIA.

5. **CURCUMA** L. Sp. Pl. 2. 1753.

Erect, often acaulescent herbs, with petioled leaves, the rootstock bearing sessile and long-stipitate tubers. Leaves appearing with or after the flowers. Inflorescence spicate, usually born on a scape. Spike large, of concave or saccate, persistent bracts, the upper of which are often elongated, empty and colored, forming a crown to the spike. Flowers bracteolate. Calyx short, cylindrical, minutely toothed. Corolla-tube funnel-shaped, the segments ovate or oblong. Lateral staminodia petal-like; lip broad; filament short, adnate to the lateral staminodia; anther-cells spurred at the base. Ovary 3-celled, many-ovuled; style filiform; stigma 2-lipped. Capsule globose; pericarp membranous, at length 3-valved. Seeds ovoid or oblong, usually arillate. [From Kerkum, an Indian name for a yellow coloring matter.] About 40 species, natives of southeastern Asia. Type species: *Curcuma longa* L.

1. **Curcuma longa** L. Sp. Pl. 2. 1753.

An acaulescent herb 6–9 dm. or more tall, the thick sessile tubers cylindrical or ellipsoid, bright yellow inside. Leaves long-petioled, the blade oblong or elliptic, 3–5 dm. long, 8–18 cm. broad, acuminate at the apex, narrowed to the base, green and glabrous on both surfaces; flower-bracts pale green, the upper ones tinged with pink; scape 12 cm. or more high; spikes cylindrical, 10–20 cm. long; bracts ovate, 3.5–4 cm. long; flowers pale yellow.

Persistent after cultivation in Porto Rico:—Cuba; Jamaica; Santo Domingo. Native of the East Indies. Its rootstocks yield the yellow dye turmeric.

6. **HEDYCHIUM** Koenig in Retz. Obs. 3: 73. 1783.

Leafy-stemmed herbs with stout horizontal rootstocks. Flowers showy, in terminal bracteate spikes or paniculate. Calyx tubular, 3-toothed. Corolla-tube slender, equalling or longer than the calyx, often half concealed by the bracts; lobes linear. Exterior staminodia 2, petal-like, often beautifully colored; lip often marked with a spot. Stamen 1; filament slender; anther oblong or linear. Ovary 3-celled; ovules many, superposed; style filiform; stigma subglobose. Capsule subglobose or oblong-ellipsoid, 3-valved. Seeds many; aril lacerate. [Greek, sweet snow.] About 38 species, natives of southern Asia and the East Indies. Type species: *Hedychium coronarium* Koenig.

1. **Hedychium coronarium** Koenig in Retz. Obs. 3: 73. 1783.

An ornamental herb with stout erect leafy stems 1–2 m. tall, and fragrant pure white flowers. Leaves oblong-lanceolate or lanceolate, mostly sessile, 2.5–5 dm. long, 4–9 cm. broad, tapering to a long-acuminate tip, acute at the

base, glabrous, or pubescent beneath; ligule membranous, 1.7–3 cm. long; spike 7–15 cm. long, 4–7 cm. in diameter, the bracts 3.5–5.5 cm. long, 2–3 cm. broad, coriaceous, turning brown in age; bracteoles 3, membranous; calyx cylindrical, 2.5–4 cm. long; corolla-tube slender, 7.5–9 cm. long, the segments linear, 3–3.5 cm. long, reflexed; lateral staminodia oblong or oblong-lanceolate, 3.5–5 cm. long; lip 3.6–4.8 cm. broad, constricted into a short claw, entire or 2-fid, lobes rounded; filament about as long as the lip, the anther 1.1–1.4 cm. long; fruit oblong, glabrous, valves orange-yellow within; seeds many, with a crimson aril.

River bottoms and moist places, spontaneous after cultivation in Porto Rico:—Cuba; Jamaica; Lesser Antilles. Commonly planted for ornament. Native of southern Asia. JASMIN CIMARRON. JASMIN DEL RIO. NARCISO.

Family 4. **MARANTACEAE** Lindl.

ARROWROOT FAMILY

Perennial herbs, with rootstocks and coriaceous or membranous pinnately veined leaf-blades. Petioles sheathing. Flowers irregular, in sessile or peduncled large-bracted spikes, racemes or panicles, two commonly arising from a 2-valved spathe-like organ of 2 bracts. Sepals 3, mostly free, equal. Petals 3, more or less united at the base. Lobes of the androecium petaloid, irregular, one fertile. Ovary 1–3-celled, inferior. Ovule solitary in each cavity, anatropous. Fruit a 1–3-celled utricle or utricle-like capsule. Seed solitary in each cavity. About 26 genera and over 150 species, mostly of tropical distribution.

Ovary 1-celled.

Exterior staminodium one; flowers purplish, paniced, sessile in 2-valved spathes.

Exterior staminodia two; flowers white, the terminal one long-pedicelled, the lower one often sessile.

Ovary 3-celled; flowers borne in large bracted spikes.

1. *Thalia*.

2. *Maranta*.

3. *Calathea*.

1. **THALIA** L. Sp. Pl. 1193. 1753.

Marsh or aquatic herbs, with long-petioled leaves. Panicles terminal. Flowers in pairs, sessile in 2-valved bract-like spathes, borne along the straight or zigzag branches of the inflorescence. Sepals 3, small, free, equal, membranous. Petals 3, free or very shortly connate. Lobes of the androecium petaloid, very irregular; lip crested within; anther 1-celled. Ovary globose or oblong-oval, with only one perfect cell; ovule solitary; style adnate to the base of the staminal tube; stigma 2-lipped, appendaged on the back. Capsule globose or oblong obovoid. Seed solitary, erect. Embryo hooked. [Named in honor of Johann Thalius, a German naturalist who died in 1588.] About 7 species, natives of tropical and warm temperate America and Africa. Type species: *Thalia geniculata* L.

1. **Thalia geniculata** L. Sp. Pl. 1193. 1753.

Maranta geniculata Lam. Tabl. Encyc. 1: 9. 1791.

Thalia angustifolia C. Wright; Griseb. Cat. Pl. Cub. 256. 1866.

Thalia dicaricata Chapm. Fl. S. U. S. ed. 1, 465. 1860.

A glabrous or somewhat pubescent perennial herb, 1–2 m. or more tall. Leaves 2-ranked; petioles sheathing at the base, at the apex with a glabrous cylindrical callus 1.5–2.4 cm. long, the blades lanceolate to ovate-lanceolate, 3–6 dm. long, 1–2.5 dm. broad, acute or acuminate at the apex, rounded at the base; panicle very large and lax, the lower branches sometimes subtended by reduced leaves; rachis flexuous, often bearded at the nodes; flower-bracts lanceolate or

oblong-ovate, scarious, glabrous, or pubescent with long scattered hairs, the outer 2-2.5 cm. long, the inner smaller; sepals elliptic or oblong, ovate, 2 mm. long; petals oblong, obtuse, 7 mm. long, 5 mm. broad; staminodia much larger than the petals, capsule oblong-oval or somewhat obovate, 7-10 mm. long.

Marshes and ditches, Porto Rico:—Florida; Hispaniola; Trinidad; continental tropical America; tropical Africa. (Recorded by Sessé & Mociño as *Maranta Galanga*. PAMPANO.

2. *MARANTA* L. Sp. Pl. 2. 1753.

Perennial herbs, with basal and cauline leaves and sheathing petioles. Inflorescence racemose or paniculate. Bracts of the inflorescence clasping at the base, caducous. Flowers in pairs, long-peduncled from the bracts, the terminal one long-pedicelled, the lower one sessile or short-pedicelled. Sepals 3, equal. Corolla tubular, usually enlarged or gibbous at the base, the three lobes subequal and somewhat hooded at the apex; two exterior staminodia petal-like, usually obovate, showy; anther free from the petaloid filament, 1-celled. Ovary 1-celled by abortion; ovule solitary; style incurved; stigma lobed. Seed 3-angled, transversely or longitudinally ridged. Embryo curved. [Named in honor of B. Maranta, a Venetian physician and botanist who died in 1754.] About 23 species, natives of tropical America. Type species: *Maranta arundinacea* L.

1. *Maranta arundinacea* L. Sp. Pl. 2. 1753.

Maranta indica Tuss. Fl. Ant. 1: 183. 1808.

A glabrous or somewhat pubescent herb, 1-2 m. tall, with scaly tuberous rootstocks and branched stems. Leaf-blades ovate-oblong or ovate-lanceolate, 6-28 cm. long, 3-10 cm. broad, acuminate at the apex, rounded or truncate at the base; bracts of the inflorescence linear or linear-lanceolate, the outer 3.5-5 cm. long; ovary glabrous or pilose; sepals lanceolate, 10-13 mm. long; corolla white, about 2 cm. long; outer staminodia obovate, emarginate, the interior shorter; fruit about 1 cm. long; seed transversely ridged, 8-9 mm. long.

Spontaneous after cultivation in Porto Rico:—Florida; West Indies; widely cultivated in tropical America and in the Old World tropics. Native of South America. MARANTA. ARROWROOT.

3. *CALATHEA* G. F. W. Meyer, Prim. Fl. Esseq. 6. 1818.

Perennial herbs with creeping or tuberous rootstocks and often long-petioled, *Canna*-like leaves. Flowers in bracted spikes, the bracts distichous or spirally arranged. Sepals 3, free. Corolla-lobes 3, more or less spreading. Androecium of 3 petal-like stamens, 2 sterile and 1 bearing a 1-celled anther on its side. Ovary 3-celled, the cells 1-ovuled. Style adnate to the base of the staminal tube. Capsule 3-celled. Seed 3-angled. [Name derived from the Greek for basket.] About 100 species, natives of the West Indies and continental tropical America. Type species: *Maranta Casupo* Jacq.

Bracts distichous, coriaceous.

1. *C. lutea*.

Bracts spirally arranged, membranous.

2. *C. Allouia*.

1. *Calathea lutea* (Aubl.) G. F. W. Meyer; Koern. Bull. Soc. Nat. Mosc. 35: 114. 1862..

Maranta lutea Aubl. Pl. Guian. 1: 4. 1775.

Maranta Casupo Jacq. Fragm. 51. 1809.

Calathea discolor G. F. W. Meyer, Prim. Fl. Esseq. 7. 1818.

Phyllodes luteum Kuntze, Rev. Gen. Pl. 695. 1891.

A rather stout herb, 2-3 m. high. Leaf-blades elliptic to broadly oval, 3.5-10 dm. long, 2.4-4.5 dm. broad, obtuse or apiculate at the apex, rounded and

often acute at the base, coriaceous, pruinose beneath; spikes 8–16 cm. long, borne on rather stout peduncles; bracts 8–12, distichous, broadly obovate or orbicular-obovate, 3.5–4 cm. broad, dark-red or purple, imbricated, coriaceous, glabrous or minutely appressed-pilose; rachis sericeous; flowers in pairs; sepals linear, 1 cm. long, obtuse, corolla-lobes elliptic; capsule 1-seeded.

Moist mountain woodlands and swampy places, Porto Rico:—Guadeloupe to Trinidad; Central and South America. PAMPANO.

2. **Calathea Allouia** (Aubl.) Lindl. Bot. Reg. 14: under *pl. 1210*. 1829.

Maranta Allouia Aubl. Pl. Guian. 1: 3. 1775.

Curcuma americana Lam. Enc. 2: 228. 1786.

Phyllodes Allouia Kuntze, Rev. Gen. Pl. 696. 1891.

A more or less pubescent herb, 8–12 dm. high. Leaf-blades oblong, lanceolate or oblanceolate, 3–5 dm. long, 8–15 cm. broad, short-acuminate at the apex, acutish or somewhat rounded at the base, dark green and glabrous or with few scattered hairs above, paler beneath, membranous; spikes solitary, ellipsoid or oval, 6–9 cm. long, the peduncle 5–8 cm. long, usually pilose; bracts ovate, 1.5–3.5 cm. long, obtuse, membranous, glabrous or minutely pubescent; sepals lanceolate, obtuse, 8 mm. long, pubescent; corolla white, the tube 2.5 cm. long, hirsute.

River valleys, Porto Rico:—Jamaica; Hispaniola; Guadeloupe (cult.); Dominica; Martinique; St. Vincent; Trinidad; South America. LLERENES.

Calathea ornata (Linden) Koern., of northern South America, grown for ornament in Porto Rico gardens, has nearly erect, long-petioled, oblong-elliptic leaves purplish beneath, pinnately banded with pink or white stripes. [*Maranta ornata* Linden.]

Order 11. ORCHIDALES.

Terrestrial, epiphytic or aquatic herbs. Flowers mostly perfect and complete, very irregular, except in BURMANNIACEAE. Calyx of 3 sepals. Corolla of 3 petals. Ovary inferior, compound. Seeds very numerous and minute; endosperm wanting.

Flowers regular; stamens and pistil distinct.

Fam. 1. BURMANNIACEAE.

Flowers irregular; stamens and pistil united into a column.

Fam. 2. ORCHIDACEAE.

Family 1. BURMANNIACEAE Blume.

BURMANNIA FAMILY.

Small often delicate herbs, with slender stems. Leaves mostly basal or reduced to cauline scales. Flowers regular, perfect, the perianth persistent or the upper part deciduous, 6-lobed or with the inner segments sometimes minute or wanting. Stamens 3–6, included, inserted on the tube of the perianth; filaments with or without appendages; anthers 2-celled, the sacs transversely dehiscent. Ovary inferior, 3-celled, or 1-celled with 3 parietal placentae; style often short; stigmas various; ovules many. Capsule many-seeded. Seeds minute, sometimes suspended on a long slender funiculus; testa thin, endosperm none. About 12 or 13 genera and over 70 species, widely distributed mostly in tropical regions.

Ovary 1-celled.

Upper part of the perianth deciduous; filaments without appendages; flowers in loose cymes.

Perianth wholly persistent on the fruit; filaments with prominent wing-like appendages; flowers racemose.

Ovary 3-celled; flowers in a dense head-like cyme.

1. *Ptychomeria*,

2. *Apteria*.

3. *Burmattia*.

1. **PTYCHOMERIA** Benth. Jour. Bot. Kew. Misc. 7: 14. 1855.

Small herbs, with simple or occasionally branched stems and scale-like leaves. Inflorescence cymose. Upper part of perianth deciduous. Filaments very short, without appendages, inserted on the corolla-tube. Ovary 1-celled, with three parietal placentae. Capsule dehiscent by three lateral valves. Seeds subglobose, ovoid, or obovoid, without a funiculus. [Greek, folded part.] About 20 species, natives of the West Indies and South America, two in tropical Africa. Type species: *Ptychomeria fimbriata* Benth.

1. **Ptychomeria portoricensis** (Urban) Schltr. Repert. 17: 257. 1921.

Gymnosiphon portoricensis Urban, Symb. Ant. 3: 445. 1902.

Plant 7–15 cm. tall, the slender pale straw-colored stems usually simple. Stem leaves ovate to broadly ovate, about 1 mm. long, obtuse at the apex; inflorescence about 2–2.5 cm. long, usually few-flowered; perianth-tube cylindrical, 3 mm. long, the three outer perianth segments narrowly ovate or oblong, entire, as long or shorter than the tube, the interior segments minute; filaments very short, inserted on the upper part of the perianth-tube; ovary turbinate, somewhat angled, about 2 mm. long; capsule obovoid, 3 mm. long; seeds oval or ovate, 0.2–0.3 mm. long, pale yellow.

Mountain forests, Porto Rico, Endemic.

2. **APTERIA** Nutt. Jour. Acad. Phila. 7: 64. 1834.

Small erect herbs with subulate scale-like leaves and long-pedicelled, racemose or sometimes solitary nodding flowers. Perianth 6-cleft, wholly persistent on the fruit, the 3 inner segments smaller. Filaments with prominent wing-like appendages, inserted in sacks in the corolla-tube. Ovary 1-celled, with three parietal placentae, free at the apex; ovules numerous. Capsule many-seeded, septicidally dehiscent. Seeds minute; testa reticulate. [Greek, not winged.] About 5 species of subtropical and tropical America. Type species: *Apteria setacea* Nutt.

1. **Apteria hymenantha** Miq. Stirp. Sur. 216. 1850.

Apteria setacea Hook. Ic. II. 3: pl. 660. 1844. Not Nutt., 1834.

Voyria tenella Griseb. Kar. 94. 1857. Not Guild., 1830.

Plant 3–16 cm. tall, the slender purple stems erect or ascending, mostly simple. Leaves scale-like, 2–3 mm. long, acuminate; flowers few, distant on slender nodding pedicels 2–9 mm. long; corolla purplish to violet-blue, together with the ovary 8–10 mm. long; capsule oval-obovoid or obovoid; seeds brown, obovoid-oblong, striate.

In leaf-mould, mountain forests of Porto Rico;—Cuba; Jamaica; Guadeloupe; Dominica; Trinidad; Central and South America.

3. **BURMANNIA** L. Sp. Pl. 287. 1753.

Erect herbs, with simple or forked stems and scale-like or linear, subulate leaves. Tube of the perianth 3-angled or 3-winged, the 3 outer lobes longer than the inner. Filaments very short; connective of the anthers prolonged beyond the sacs. Ovary 3-celled; style short, stigmas often lobed. Capsule crowned by the perianth, opening by irregular lateral ruptures. Seeds very minute; testa thin, striate or reticulate. [In honor of Johann Burmann, Dutch

botanist of the eighteenth century]. Over thirty species, natives mostly of warm regions. Type species: *Burmannia disticha* L.

1. ***Burmannia capitata*** (Walt.) Mart. Nov. Gen. 1: 12. 1824.

Anonymos capitatus Walt. Fl. Car. 69. 1788.

Vogelia capitata J. F. Gmel. Syst. 107. 1791

Plant 5–27 cm. tall, the filiform stems usually simple. Leaves linear-subulate, scattered, 2–6 mm. long; flowers several or many, in a dense terminal head-like cyme; perianth together with the ovary 3–5 mm. long, whitish or bluish, the tube angled; seeds linear-oblong, spirally striate.

On a clay-wall along the road to Las Marias, three miles from Mayaguez;—south-eastern United States; Jamaica; Trinidad; South America.

Family 2. **ORCHIDACEAE** Lindl.

ORCHID FAMILY

Perennial herbs, with sheathing entire leaves, sometimes reduced to scales; flowers perfect, irregular, bracted, solitary, spiked or racemed. Perianth superior, of 6 segments, the 3 outer (sepals) similar or nearly so, 2 of the inner ones (petals) lateral, alike; the third inner one (lip) dissimilar, often markedly so, usually larger, often spurred, sometimes inferior by torsion of the ovary or pedicel. Stamens variously united with the style into an unsymmetrical column; anther 1 or in *Cypripedium* 2, 2-celled; pollen in 2–8, pear-shaped, usually stalked masses (pollinia), united by elastic threads, the masses waxy or powdery, attached at the base to a viscid disk (gland). Style often terminating in a beak (rostellum) at the base of the anther or between its sacs. Stigma a viscid surface, facing the lip beneath the rostellum, or in a cavity between the anther-sacs (clinandrium). Ovary inferior, usually long and twisted, 3-angled, 1-celled; ovules numerous, anatropous, on 3 parietal placentae. Capsule 3-valved. Seeds very numerous, minute, mostly spindle-shaped, the loose coat hyaline, reticulated; endosperm none; embryo fleshy. About 410 genera and 5000 species, of wide distribution, most abundant in the tropics, called ORCHIDS, many of those of warm regions epiphytes.

A. Anther persistent on a short, broad filament; pollinia caudate; terrestrial orchids.

B. Anther deciduous; pollinia mostly ecaudate.

1. Inflorescence terminal.

a. Leaves convolute in the bud; terrestrial orchids.

*Anther much exceeding the rostellum.

Low herbs.

Flowers axillary; anther not articulated.

Flowers racemose; anther articulated with the column.

Long, climbing vines.

**Anther about as long as the rostellum.

†Leaves fleshy, not plicate-nerved.

‡Lip turned outward, usually pendulous.

§Pollinia powdery or waxy, not in masses.

γRostellum prolonged, 2-lobed.

Inflorescence spiral; lateral sepals free.

Inflorescence not spiral; lateral sepals more or less connate.

γγRostellum not 2-lobed.

Rostellum scarcely produced, the gland in a cavity at its tip.

Rostellum distinctly produced.

Gland suspended by a membrane from the apex of the rostellum.

Lateral sepals distinct.

1. *Habenaria*.

2. *Triphora*.

3. *Psilochilus*.

4. *Vanilla*.

5. *Ibidium*.

6. *Hapalorchis*.

7. *Mesadenus*.

8. *Beadlea*.

- Lateral sepals connate.
 Gland sessile on the rostellum apex;
 sepals spurred.
 Lip not clawed.
 Lip clawed.
- §§ Pollinia sectile, in several masses; lip
 spurred.
- ‡‡ Lip turned inward.
 § Lip free.
 Sepals distinct.
 Sepals united at the base.
- §§ Lip and petals with claws adnate to the
 column.
- †† Leaves hard, firm, plicate-nerved.
- b. Leaves duplicate in the bud.
- * Inner perianth-parts more conspicuous than the
 outer.
- † Leaves not plicate.
 † Leaves not articulated; pollinia not appen-
 daged; terrestrial bulbous orchids.
 Column short; anther erect.
 Column long; anther incumbent.
- ‡‡ Leaves articulated; pollinia mostly caudiculate
 or stipitate; mostly epiphytic orchids.
- § Pollinia stipitate.
- §§ Pollinia caudiculate or unappendaged.
- γ Column with a foot (See *Tetragamestes*).
- Lip flexuous, elongated; plants many-
 leaved, simple.
- Lip 3-lobed or entire; plants branched,
 few-leaved.
- Pollinia 4.
 Pollinia 8.
- γγ Column without a foot.
- β Pollinia 4.
 γ (Pollinia ovoid, scarcely com-
 pressed.
- γγ Pollinia compressed.
 Column free from the lip;
 small-leaved plants without
 pseudobulbs.
- Column partly or wholly adnate
 to the lip.
 Column partly adnate to
 the lip; plants with
 pseudobulbs.
 Lip 3-lobed, longitudin-
 ally crested or ap-
 pended.
- Lip entire, neither crest-
 ed nor append-
 aged.
 Lip concave, shell-
 like.
 Lip nearly linear.
- Column wholly adnate to
 the lip; plants mostly
 without pseudobulbs.
 Flowers in a terminal
 panicle or raceme
 or solitary.
- Plants with pseudo-
 bulbs.
 Plants without
 pseudobulbs.
- Flowers axillary to
 bracts borne along a
 rachis.
- ββ Pollinia 8.
 Lip flat, sessile, 3-lobed.
 Lip narrow below, abruptly ex-
 panded into a broad lamina.
- †† Leaves plicate.
- ** Outer perianth parts more conspicuous than the
 inner, epiphytic orchids; pollinia 2.
 Sepals all connate, free at apex.
 At least the dorsal sepal free.
 Petals narrow, free.
 Petals transversely oblong, their claws adnate to
 the column.
9. *Pelexia*.
10. *Stenorhynchus*.
11. *Eltroplectis*.
12. *Physurus*.
13. *Cranichis*.
14. *Prescottia*.
15. *Ponthiera*.
16. *Corymborchis*.
17. *Malaris*.
18. *Liparis*.
19. *Polystachya*.
20. *Isochilus*.
21. *Tetragamestes*.
22. *Octadesmia*.
23. *Hormidium*.
24. *Jacquinella*.
25. *Encyclia*.
26. *Anacheilium*.
27. *Nidema*.
28. *Auliza*.
29. *Amphiglottis*.
30. *Spathiger*.
31. *Tetramicra*.
32. *Epidendrum*.
33. *Elleanthus*.
34. *Stelis*.
35. *Pleurothallis*.
36. *Lepanthes*.

2. Inflorescence lateral (See *Govenia*).
 a. Leaves convolute in the bud.
 *Internodes of the stem not tuberous-thickened.
 Pollinia caudiculate, not stipitate; terrestrial orchids. 37. *Bletia*.
 Pollinia ecaudiculate, stipitate.
 Lip 3-lobed.
 Lip not saccate; epiphytic orchids with fusiform pseudobulbs. 38. *Cyrtopodium*.
 Lip saccate; terrestrial orchids with tuber-like pseudobulbs. 39. *Platypus*.
 Lip entire; terrestrial orchids; raceme terminal. 40. *Govenia*.
 **Stem with tuberous-thickened internodes.
 Flowers on a scape from the base of a pseudobulb. 41. *Xylobium*.
 Raceme terminating a leafy shoot. 42. *Koellensteinia*.
 b. Leaves duplicate in the bud.
 *Stems sympodial.
 Inflorescence normally several-many-flowered.
 Lip jointed with the foot of the column.
 Flowers many, in a long spike. 43. *Bolbophyllaria*.
 Flowers few among the leaves. 44. *Ornithidium*.
 Lip not jointed with the foot of the column.
 Flowers spurred or saccate.
 Lateral sepals connate, saccate; lip not spurred. 45. *Ionopsis*.
 Lateral sepals and lip spurred. 46. *Comparettia*.
 Flowers neither spurred nor saccate.
 Anthers not appendaged. 47. *Oncidium*.
 Anthers with a membranous appendage. 48. *Leochilus*.
 . Inflorescence 1-flowered. 49. *Warszewiczella*.
 **Stems monopodial.
 . Leaf-blades persistent; flowers solitary. 50. *Dichaea*.
 . Leaf-blades, when present, separating from the sheaths; flowers spicate or racemose.
 Capsule dehiscent by 3 apical valves. 51. *Campylocentrum*.
 Capsule dehiscent by 6 apical valves. 52. *Harristella*.

1. **HABENARIA** Willd. Sp. Pl. 4: 44. 1806.

Terrestrial orchids, with tuberous or coarsely fibrous roots, erect stems, broad or narrow flat, alternate or basal leaves, and large or small flowers in a terminal spike or spike-like raceme. Sepals distinct, or cohering at the base. Petals 2-parted or entire. Lip drooping or spreading, 3-parted or entire, spurred at the base, the spur mostly elongated. Column short, without a foot. Anther persistent, 2-celled; pollinia granular, caudate or caudiculate. Capsule oblong. [Latin, thong-like, referring to the spur.] Fifty species or more, of warm-temperate and tropical regions. Type species: *Orchis Habenaria* L.

- Petals 2-parted; lip 3-parted.
 Stigmatic processes elongated; leaves mostly basal. 1. *H. distans*.
 Stigmatic processes short; stem leafy. 2. *H. monorrhiza*.
 Sheaths of the leaves mottled. 3. *H. repens*.
 Sheaths not mottled.
 Petals simple; lip undivided. 4. *H. eustachya*.
 Leaves acute; ovary wingless. 5. *H. alata*.
 Leaves acuminate; ovary 6-winged.

1. **Habenaria distans** Griseb. Cat. Pl. Cub. 270. 1866.

Roots bearing small subglobose tubers; stem scapose, slender, 2-4 dm. high, bearing 2-4 narrow scales 1-3 cm. long. Leaves 4-6, basal, or 1 or 2 of them on the lower part of the stem, thin, oblong to elliptic-lanceolate, 4-16 cm. long, the apex acute, the base narrowed and sheathing; raceme spike-like, few-flowered, 6-12 cm. long, the flowers greenish; bracts lanceolate, acuminate, 1-2 cm. long; sepals oblong to ovate, 5-6 mm. long; petals 2-parted, the segments unequal; lip deeply 3-parted, 6-8 mm long, the spur narrowly clavate, about 1.5 cm. long, about as long as the ovary; stigmatic processes elongated.

Woodlands, Monte Mesa, Mayaguez.—Florida; Jamaica; Cuba; Hispaniola.

2. **Habenaria monorrhiza** (Sw.) Rehb. f. Ber. Deutsch. Bot. Gesell. **3**: 274. 1885.

Orchis monorrhiza Sw. Prodr. 118. 1788.

Habenaria maculosa Lindl. Gen. & Sp. Orch. 309. 1835.

Tuber obovoid; stems leafy, 3–12 dm. high, rather stout. Leaf-sheaths brown-mottled, the blades lanceolate to ovate-lanceolate, 5–10 cm. long, or the upper smaller, the apex acute or acuminate, the base cordate-clasping; raceme densely many-flowered, 18 cm. long or less; flowers white or greenish-white; bracts lanceolate, 1–2.5 cm. long; dorsal sepal ovate-orbicular, obtuse, hooded, 6–8 mm. long, the lateral ones about as long, oblong, acute; petals 2-parted, the segments unequal; lip deeply 3-parted, 7–10 mm. long, the segments narrow; spur slender, about 2 cm. long; stigmatic processes short; capsule oblong, about 13 mm. long.

Hillsides, banks and cliffs at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; Tortola;—Jamaica; Cuba; Hispaniola to Trinidad; northern South America.

3. **Habenaria repens** Nutt. Gen. **2**: 190. 1818.

Roots coarsely fibrous; stems slender or rather stout, leafy, 2–6 dm. high. Leaf-sheaths green, the blades lanceolate to linear-lanceolate, 6–20 cm. long, 1–2 cm. wide, acute or acuminate, or the upper much smaller; raceme several-many-flowered 5–18 cm. long; flowers greenish; bracts lanceolate, 8–12 mm. long; sepals membranous, the dorsal one broadly ovate, about 5 mm. long, the lateral ones oblong; petals 2-parted, the segments unequal; lip 3-parted nearly to the base; spur filiform, about 1 cm. long; stigmatic processes short; capsule about 1 cm. long.

In wet sand between Manati and Vega Baja, Porto Rico;—southeastern United States; Cuba; Jamaica.

4. **Habenaria eustachya** Rehb. f. Ber. Deutsch. Bot. Gesell. **3**: 274. 1885.

Tubers small, ellipsoid; stems rather stout, leafy, pale, 5–10 dm. high. Leaves thin, lanceolate or oblong-lanceolate, up to 15 cm. long, 1.5–5 cm. wide, the apex acute, the narrowed base sheathing, the upper ones reduced to scales 1.5–2 cm. long; raceme densely many-flowered, 6–30 cm. long; flowers greenish; bracts narrow, acuminate, 1–2 cm. long; sepals about 5 mm. long, the dorsal one broad, obtuse, the lateral ones elliptic, apiculate; petals oblong-quadrangular, simple, subtruncate, 3-denticulate, a little shorter than the dorsal sepal; lip linear, angled below, about 8 mm. long; spur about 9 mm. long.

Woodlands and grassy slopes in the western hills and mountains of Porto Rico;—Florida; Jamaica; Cuba; Hispaniola.

5. **Habenaria alata** Hook. Exot. Fl. *pl.* 169. 1826.

Tuber obovoid; stems rather stout, leafy, 3–8 dm. high. Leaves lanceolate, close together, 12 cm. long or less, 8–18 mm. wide, the apex acuminate, the base rather broad, sheathing, the uppermost much smaller; raceme several-many-flowered, 8–18 cm. long; bracts narrow, acuminate, about as long as the greenish flowers; ovary 6-winged; sepals 6–7 mm. long, the dorsal one ovate, acute, the lateral ones ovate-oblong, short-acuminate; petals linear-lanceolate, entire, acuminate; lip linear, undivided, about as long as the lateral sepals; spur linear, 10–12 mm. long; stigmatic processes short. [*H. monorrhiza* of Cogniaux, not of Reichenbach.]

Hillsides near Maricao, Porto Rico; St. Thomas;—Jamaica; Cuba; Hispaniola; Antigua to Tobago; Central America.

2. **TRIPHORA** Nutt. Gen. 2: 192. 1818.

Low terrestrial orchids with fleshy tubers and axillary flowers. Sepals and petals separate, ascending, subequal. Lip erect, slightly clawed, and more or less 3-lobed, not crested, spurless. Column elongated, club-shaped at the entire or lobed summit. Anther terminal, longer than the rostellum, stalked, rigidly attached to the back of the column, its sacs parallel; pollinia 2, 1 in each sac, powdery-granular, without caudicles, the pollen-grains compound, the extine pitted or reticulated. Stigma a flattened disk below the anther. Capsule oblong or oval. [Greek, bearing three, in allusion to the usual 3 flowers of the type species.] About 10 species, natives of America. Type species: *Triphora pendula* Nutt.

1. **Triphora surinamensis** (Lindl.) Britton.

Pogonia surinamensis Lindl. Lond. Journ. Bot. 2: 674. 1843.

Stem erect from an obliquely horizontal base, slender, 1–2.5 dm. high, bearing a few leaves above and 2 or 3 sheathing scales below. Leaf-blades ovate, 5-nerved, 1.5–3 cm. long, the apex acute or short-acuminate, the base rounded or subcordate; flowers few, rose-colored, solitary in the upper axils; the nearly erect peduncles 2 cm. long or less; sepals linear, 10–12 mm. long; petals narrowly spatulate, a little shorter than the sepals; lip obovate, about as long as the petals, 3-lobed at the apex; capsule oblong, 10–20 mm. long.

Woodlands, Luquillo Mountains, and on Monte Helechal, Porto Rico:—Guadeloupe; Dominica; Trinidad and Guiana.

3. **PSILOCHILUS** Rodrig. Orch. Nov. 2: 272. 1882.

Terrestrial orchids, with fleshy roots and leafy stems, the flowers racemose in the Porto Rico species. Sepals and petals nearly alike. Lip clawed, 3-lobed, without a spur. Column elongated, the apex entire or lobed. Anther terminal, erect, articulated with the top of the column, its sacs facing outward; pollen-grains compound, the extine pitted or reticulated. Capsule oblong. [Greek, naked lip.] A few species of tropical America. Type species: *Psilochilus modestus* Rodrig.

1. **Psilochilus macrophyllus** (Lindl.) Ames, Orchidaceae 7: 45. 1922.

Pogonia macrophylla Lindl. Ann. & Mag. Nat. Hist. III. 1: 335. 1858.

Pogonia physurifolia Rehb. f. Nederl. Kruidk. Arch. 4: 324. 1859.

Stem erect, rather stout and fleshy, often forked, 2–3 dm. high, the roots long, thick and fleshy. Leaves few, the sheaths 1–2.5 cm. long, the blades rather fleshy, ovate, 5–7-nerved, 5–7 cm. long, the apex acute or obtuse, the base rounded or cordate; raceme several-many-flowered, 5–10 cm. long; bracts broadly ovate, spreading, sessile, subcordate, 8–12 mm. long; flowers short-pedicelled, greenish or greenish-yellow; sepals linear-oblong, about 15 mm. long; petals ligulate, a little shorter than the sepals; lip narrowly obovate, as long as the petals, clawed, 3-lobed.

Woodlands and forests in wet or moist districts, Porto Rico, ascending to 900 meters in the western mountains, not observed in the eastern mountains:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

4. **VANILLA** Juss. Gen. 66. 1789.

Fleshy climbing orchids, the leaves broad or reduced to mere scales, the stems giving off aerial roots, the mostly large flowers in axillary spikes or racemes. Sepals nearly alike, distinct, spreading. Petals resembling the sepals. Lip

clawed, the claw adnate to and embracing the long column. Stigma borne under the rostellum. Anther convex, its sacs separate; pollinia powdery. Capsule elongated, fleshy, indehiscent or tardily partly dehiscent. [From the Spanish name for the fruit.] About 20 species, of tropical and subtropical regions. Type species: *Epidendrum Vanilla* L.

Leaves broad, ample, 10–20 cm. long.
Leaves oblong-lanceolate, 8 cm. long or less.

1. *V. inodora*.
2. *V. Eggersii*.

1. **Vanilla inodora** Schiede, *Linnaea* 4: 474. 1829.

Vanilla anaromatica Griseb. *Fl. Br. W. I.* 638. 1864.

Stem terete, elongated, often 10 m. long or longer, climbing on trees or clambering on banks or in thickets; aerial roots few. Leaves firm, becoming thin in drying, broadly elliptic to ovate-lanceolate, 10–20 cm. long, 4–10 cm. wide, the apex acuminate, the base obtuse or rounded, the petiole very short; racemes few-flowered, short-peduncled; bracts ovate-lanceolate, acute, 1.5–3 cm. long; sepals and petals similar, lanceolate, 5–6 cm. long, green, bluntly acuminate; lip broad, white, somewhat 3-lobed, a little shorter than the sepals; capsule cylindrical, pendulous, slender, 10–25 cm. long, indehiscent. [*V. aromatica* of Urban's *Symbolae*, not of Swartz.]

On trees and banks in forests of the eastern mountains of Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; Mexico; Guiana.

2. **Vanilla Eggersii** Rolfe, *Journ. Linn. Soc.* 32: 472. 1896.

Elongated, described as sometimes 30 m. in length and often 10 m. long or longer, the stems terete, 1-grooved, 1–1.5 cm. thick, the aerial roots 5–8 cm. long, tendril-like. Leaves sessile, oblong-lanceolate, acute or acuminate, 2–8 cm. long, 8–15 mm. wide; peduncle stout, geniculate, 5–10 cm. long, bearing an ovate or oblong, acute bract at each node; spike several-flowered, 6–14 cm. long; bracts triangular-ovate, about 5 mm. long; sepals and petals oblong-lanceolate, obtuse or acutish, 4–6 cm. long; lip about as long as the sepals, rounded, crenate or undulate, not lobed; capsule indehiscent, cylindrical or subclavate, 5–12 cm. long, 8–10 mm. thick. [*V. aphylla* of Eggers, not of Blume.]

Thickets and rocky woodlands at lower and middle elevations, Porto Rico, mostly in dry districts; Vieques; St. Thomas; Virgin Gorda:—Florida; Bahamas; Cuba; Hispaniola. Included by Fawcett and Rendle in *V. claviculata* Sw. GUNGULE.

Vanilla Vanilla (L.) Britton [*Epidendrum Vanilla* L.; *Vanilla planifolia* Andr.] VANILLA BEAN, occasionally cultivated in Porto Rico for its fragrant fruit, has large lanceolate leaves, large yellowish flowers, the fleshy capsules up to 2 dm. long. It is native of South America.

5. **IBIDIUM** Salisb. *Trans. Hort. Soc. Lond.* 1: 291. 1812.

Erect terrestrial orchids, with fleshy-fibrous or tuberous roots and slender stems or scapes, leaf-bearing below or at the base. Flowers small, spurless, spiked, 1–3-rowed, the spikes more or less twisted. Sepals distinct. Petals lingulate, oblique. Lip concave, erect, embracing the column and often adherent to it, spreading and crisped at the apex, bearing minute callosities at the base. Column arched below, obliquely attached to the top of the ovary. Rostellum 2-lobed. Anther without a lid, borne on the back of the column, erect. Stigma ovate, prolonged into an acuminate beak, at length bifid. Pollinia 2, 1 in each sac, powdery. Capsule ovoid or oblong, erect. [Latin, like the beak of an Ibis.] About 35 species, natives of temperate and tropical regions. Type

species: *Ophrys spiralis* J. E. Smith. This genus has formerly been regarded as containing many species now referred to other genera.

1. **Ibidium tortile** (Sw.) House, *Muhlenbergia* 1: 129. 1906.

Neottia tortilis Sw. *Vet. Akad. Handl.* 1800: 226. 1800.

Spiranthes tortilis L. C. Rich. *Mem. Mus. Par.* 4: 59. 1818.

Stem slender, erect, 3–6 dm. high, glabrous below, pubescent above, bearing 2–4 bladeless acute sheaths above, and sometimes a narrowly linear leaf 2–7 cm. long, below the middle. Basal leaves 2 or 3, present at flowering time, linear, 8–30 cm. long, 1.5–2.5 mm. wide; spike erect, 6–13 cm. long, pubescent, the approximate flowers in a single spiral; flowers white; bracts ovate or ovate-lanceolate, pubescent, acute or acuminate, 6–7 mm. long, about as long as the ovary; sepals 5–6 mm. long, the median one elliptic, obtuse, the lateral ones oblong, oblique; petals oblong, about as long as the sepals; lip 4–6 mm. long, ovate-elliptic, emarginate, the callosities short; capsule about 5 mm. long. [*Gyrostachys peruviana* of Kuntze.]

Grassy slopes and fields, at lower and middle elevations, Porto Rico, ascending to 900 meters; St. Thomas:—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Martinique.

6. **HAPALORCHIS** Schlechter, *Beihefte Bot. Centr.* 37: 362. 1920.

Terrestrial orchids with thick fascicled roots and broad flat petioled basal and lower leaves, those of the scape reduced to sheathing scales. Flowers rather large, few in a terminal bracted raceme. Sepals narrowly oblong, obtuse. Petals narrow, oblique. Lip oblong, sessile. Column slender, without a foot; rostellum 2-lobed. Anther ovate-lanceolate, hooded; pollinia viscid. [Greek, tender orchid.] Four known species of the West Indies and South America. Type species: *Sauroglossum candidum* Kraentzlein.

1. **Hapalorchis tenuis** (Lindl.) Schlechter, *Beihefte Bot. Centr.* 37: 363. 1920.

Sauroglossum tenue Lindl. *Ann. & Mag. Nat. Hist.* III. 1: 334. 1838.

Spiranthes Fawcettii Cogn. *Repert.* 7: 123. 1909.

Leaves about 5, thin, the slender petioles 2–3.5 cm. long, the blades ovate or ovate-lanceolate, about as long as the petioles, the apex acute, the base rounded or subtruncate. Scape slender, rather weak, 8–20 cm. long, bearing several nearly linear, acuminate scales; raceme 2–7-flowered; flowers white; bracts linear-lanceolate, acuminate, 1–1.5 cm. long; sepals 7–8 mm. long; petals linear, a little shorter than the lateral sepals; lip 3-lobed.

Primaeval forests of the central and western mountains, Porto Rico:—Jamaica; Cuba.

7. **MEASDENUS** Schlechter, *Beihefte Bot. Centr.* 37: 368. 1920.

Terrestrial orchids, with fascicled fleshy roots, mostly basal lanceolate leaves and small, green or yellowish flowers in a terminal raceme. Sepals narrow, distinct. Petals ligulate, a little shorter than the sepals. Lip subsessile, oblong to lanceolate, about as long as the petals, spurless. Column slender, with a very short foot. Rostellum not produced, emarginate. Anther short, obtuse; pollinia oblong, viscid. [Greek, middle gland.] Five known species, of Mexico, the West Indies and Brazil. Type species: *Spiranthes Galeottiana* A. Rich.

1. **Mesadenus lucayanus** (Britton) Schlechter, Beihefte Bot. Centr. **37**: 368. 1920.

Ibidium lucayanum Britton, Bull. N. Y. Bot. Gard. **5**: 312. 1907.

Spiranthes lucayana Cogn. in Urban, Symb. Ant. **6**: 338. 1909.

Spiranthes Stahlii Cogn. in Urban, Symb. Ant. **6**: 341. 1909.

Root of cylindrical fleshy tubers 2-6 cm. long, 8-10 mm. thick. Basal leaves present at flowering time, oblong-lanceolate, oblanceolate to elliptic, thin but somewhat fleshy, spreading, 5-nerved, reticulate-veined, at least when dry, 5-17 cm. long, 1-3 cm. wide, acute at the apex, narrowed at the base into a rather slender petiole; scape slender, 2-4 dm. high, its several leaves linear or linear-lanceolate, acute or acuminate, appressed, 1-3 cm. long; spike 5-25 cm. long, about 1 cm. thick, usually many-flowered; bracts lanceolate, acuminate, erect, as long as the ovary or longer; flowers green, or brownish green, spreading; sepals linear-lanceolate, acutish, 3-4.5 mm. long; petals linear; lip ovate-oblong, obtusish, concave, 3-5 mm. long, about one third as wide as long, with two minute callosities at the base; capsule oblong, blunt, about 5 mm. long.

Rocky hillsides, near Ponce and Guanica and sandy soil near Cangrejos, Porto Rico; Mona; coastal plain of Anegada:—Florida; Bahamas; Trinidad (?).

8. **BEADLEA** Small, Fl. S.E. U. S. 319, 1329. 1903.

[? *CYCLOPOGON* Presl, Rel. Haenk. 93. 1827.]

Terrestrial orchids, with thick fleshy-fibrous roots, the leaves broad, mostly basal and petioled, the flowers medium-sized or small, spicate or subracemose on a slender sheathed scape. Sepals distinct, the middle one adnate to the lateral petals. Lip folded around the column and more or less adnate to it, entire or 3-lobed. Column terete. Anther ovoid, erect; pollinia granulate, caudiculate. Capsule oblong. In honor of C. D. Beadle, Curator of the Biltmore Herbarium. Numerous species of tropical and subtropical America. Type species: *Spiranthes Storeri* Chapm.

Lip entire, narrowly oblong.
Lip 3-lobed; leaves ovate.

1. *B. elata*.
2. *B. cranichoides*.

1. **Beadlea elata** (Sw.) Small; Britton, Mem. Brooklyn Bot. Gard. **1**: 38. 1918.

Satyrium elatum Sw. Prodr. 119. 1788.

Spiranthes elata L. C. Rich. Mem. Mus. Paris **4**: 59. 1818.

Sauroglossum Richardi Ames, Orch. **1**: 44. 1905.

Cyclopogon elatum Schlechter, Beihefte Bot. Centr. **37**: 387. 1920.

Roots fleshy, fascicled, 8 cm. long or less; scape slender, 6 dm. high or less, glandular-pubescent above. Leaves 3-5, the blade oblong to elliptic, 7-12 cm. long, 2.5-5 cm. wide, the apex acute, the base narrowed or rounded, the flat petiole 4-7 cm. long; scales of the scape several, 2-4 cm. long, narrow; raceme spike-like, several-flowered, 7-12 cm. long; flowers greenish; sepals about 4 mm. long, obtuse, the dorsal one broader than the lateral ones; petals linear-spatulate, obtuse; lip narrowly oblong, about as long as the lateral sepals, white, dilated above.

Forests in wet or moist districts, Porto Rico, mostly at higher elevations; St. Thomas; St. Croix; St. Jan:—Jamaica; Cuba; Hispaniola; St. Martin to Trinidad; tropical South America.

Spiranthes bico'or Lindl., recorded by Cogniaux as found by Sintenis near Utuado, described as differing from the preceding species by narrower leaves, does not appear to be specifically distinct. Its type locality is Trinidad.

2. **Beadlea cranichoides** (Griseb.) Small, Fl. SE. U. S. ed. 2, 320, 1375. 1913.

Pelexia cranichoides Griseb. Cat. Pl. Cub. 269. 1866.

Sauroglossum cranichoides Ames, Proc. Biol. Soc. Wash. 17: 117. 1904.

Spiranthes cranichoides Cogn. in Urban, Symb. Ant. 4: 338. 1909.

Beadlea Storeri Small, Fl. SE. U. S. 319, 1329. 1903.

Roots few, about 6 mm. thick; scape slender, weak, 1.5–3.5 dm. high, bearing several sheathing narrow acuminate scales 1–2 cm. long, glabrous below, puberulent above. Leaves several, basal, 3–7 cm. long, the blade ovate, acute or acuminate, the base rounded, the petiole 1–2 cm. long; spike 3–8 cm. long, loosely several-flowered; bracts narrowly lanceolate, acuminate, 7–10 mm. long; sepals oblong obtuse or acutish, about 4 mm. long; petals narrowly spatulate, about as long as the sepals; lip about 4 mm. long, 3-lobed, white, nearly truncate.

Mountain forest near Las Marias, Porto Rico.—Florida; Cuba.

9. **PELEXIA** Poit.; L. C. Rich. Mem. Mus. Paris 4: 59. 1818.

Terrestrial orchids, with thick clustered roots, petioled basal leaves, the flowers spicate at the summit of a sheathed scape. Sepals narrow, the median one adnate to the petals, the lateral ones united below and prolonged into a sac. Lip concave, elongated, embracing the short column. Column without a foot. Rostellum subulate. Anther narrowly oblong; pollinia powdery. Capsule ellipsoid. [Greek, from the fancied resemblance of the lip to a hatchet.] About 50 species, of tropical and subtropical America, the following typical.

1. **Pelexia adnata** (Sw.) Spreng. Syst. 3: 704. 1826.

Neottia adnata Sw. Fl. Ind. Occ. 3: 1409. 1806.

Pelexia spiranthoides Lindl. Bot. Reg. 12: pl. 985. 1826.

Scape pubescent above, 2.5–4 dm. high. Basal leaves 2–5, glabrous, the blades elliptic or ovate-elliptic, 5–12 cm. long, 3-nerved, acute at the apex, rounded at the base, the slender, nearly erect petioles 7–14 cm. long, reddish; sheaths of the scape acuminate, 2–5 cm. long; spike pubescent, many-flowered, 6–12 cm. long; bracts narrowly lanceolate, about as long as the whitish flowers; sepals about 6 mm. long, the median one elliptic, obtuse, concave, the lateral ones linear, acute; petals linear, nearly as long as the sepals; lip tubular below, 5–6 mm. long; capsule about 1.5 cm. long, 6-ribbed.

Mountain forests of Porto Rico.—Bahamas; Jamaica; Cuba; Guadeloupe; St. Vincent; Grenada; Margarita; Venezuela. Recorded by Krebs as formerly found in St. Thomas.

10. **STENORRHYNCHUS** L. C. Rich. Mem. Mus. Paris 4: 59. 1818.

Erect terrestrial orchids, with clustered fleshy roots, lanceolate to elliptic basal leaves often wanting at flowering time, the sheathed scape terminated by a spike of rather large, often showy, mostly red or yellow flowers. Sepals nearly equal, the median one adnate to the petals, the lateral ones united below and produced into a sac or spur. Petals mostly shorter than the sepals. Lip entire or nearly so, concave, without callosities. Column with a foot; stigma under the beaked rostellum. Anther oblong or lanceolate; pollinia powdery. [Greek, narrow beak.] About 40 species, of tropical and subtropical America. Type species: *Neottia speciosa* Jacq.

Leaves present at flowering time; lip 3-lobed; scape glabrous.

1. *S. speciosus*.

Leaves absent at flowering time; lip entire; scape scurfy or glandular.

2. *S. lanceolatus*.

1. **Stenorrhynchus speciosus** (Jacq.) L. C. Rich. Mem. Mus. Paris **4**: 59. 1818.

Neottia speciosa Jacq. Icon. Rar. **3**: pl. 600. 1786-93.

Scape stout, glabrous, 3-6 dm. high, bearing a few short scales; leaves several, present at flowering time, oblong or narrowly elliptic, firm in texture, 10-30 cm. long, 3-6 cm. wide, the apex acute, the base gradually narrowed into a short, broad petiole. Flowers many, scarlet, in a dense spike 10 cm. long or less; bracts scarlet, lanceolate, acuminate, glabrous, as long as the flowers or the lower longer; sepals about 15 mm. long; sac small and rounded; petals nearly linear, acute; lip 3-lobed, the middle lobe lanceolate, acute.

Primeval forest near Lares, Porto Rico;—Jamaica; Cuba; continental tropical America.

2. **Stenorrhynchus lanceolatus** (Aubl.) Griseb. Fl. Br. W. I. 642. 1864.

Limodorum lanceolatum Aubl. Pl. Guian. **2**: 821. 1775.

Satyrium orchiooides Sw. Prodr. 118. 1788.

Stenorrhynchus orchiooides L. C. Rich. Mem. Mus. Paris **5**: 59. 1818.

Leaves 1-3, oblong to oblong-lanceolate, bright green, glabrous, 1-3 dm. long, 2-5 cm. wide, acute at the apex, narrowed at the base into margined petioles, wanting at flowering time. Scape rather stout, 3-6 dm. high, erect, scurfy or somewhat glandular-pubescent, bearing several acuminate sheathing scales 2-4 cm. long; spike several-many-flowered, 5-10 cm. long; bracts lanceolate, acuminate, shorter than the flowers; flowers red or yellow, 2-3 cm. long; ovary oblong, oblique at the apex; sepals glandular, lanceolate, acute, 5-7-nerved; petals oblong-lanceolate, acute, 5-7-nerved; lip lanceolate, acute or acuminate, saccate at about the middle; capsule about 1 cm. long.

Grassy slopes in wet or moist districts, Porto Rico, ascending into the Luquillo Mountains; St. Thomas;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America. Races differ in pubescence and in color of flowers.

11. **ELTROPECTRIS** Raf. Fl. Tell. **2**: 51. 1837.

[CENTROGONIUM Schlechter, Beihefte Bot. Centr. **37**: 451. 1920.]

Terrestrial orchids, with thick fleshy clustered roots, basal broad leaves, and rather large flowers, racemose at the summit of a slender scape. Sepals oblong to lanceolate, unequal, prolonged and connate at the base and adnate to the base of the lip. Petals narrow, oblique. Lip long-clawed. Rostellum subulate. Anther hooded. [Greek, referring to the spur.] Seven known species, natives of tropical America. Type species: *Neottia calcarata* Hook. f.

1. **Eltropectris acuminata** Raf. Fl. Tell. **2**: 51. 1837.

Neottia calcarata Hook. f. Bot. Mag. pl. 3403. 1835. Not Sw., 1806.

Pelexia setacea Lindl. Gen. & Sp. Orch. 482. 1840.

Centrogonium setaceum Schlechter, Beihefte Bot. Centr. **37**: 453. 1920.

Scape 3-6 dm. high, puberulent above, bearing several acuminate sheaths 2-4 cm. long. Basal leaves 1-3, the blades elliptic or oval, 8-15 cm. long, acute at the apex, obtuse or rounded at the base, several-nerved, the slender petioles 10-18 cm. long; spike few-several-flowered, pubescent, 15 cm. long or less; bracts ovate-lanceolate, 2-2.5 cm. long, long-acuminate into a filiform tip; ovary fusiform, about 2 cm. long; perianth purplish-green or greenish-white; sepals narrowly lanceolate, 2.5-3 cm. long, the spur 8-10 mm. long; petals narrowly lanceolate, about 2 cm. long; lip white; capsule about 2 cm. long, 6-ribbed.

Primeval forest, Sierra de Lares and at Indiera Fria near Maricao, Porto Rico;—Bahamas; Jamaica; Cuba; Hispaniola; Trinidad; northern South America.

12. **PHYSURUS** L. C. Rich. Mem. Mus. Paris 4: 55. 1818.[*ERYTHRODES* Blume, Bijdr. Fl. Ned. Ind. 410. 1825.]

Leafy-stemmed, terrestrial orchids, with thick clustered roots, the leaves broad, petioled, parallel-nerved and reticulate-veined, convolute in the bud, the small flowers in a terminal spike. Sepals distinct, nearly equal, the small petals cohering with the median one. Lip erect, 3-lobed, embracing the short column, produced below into a blunt pouch-like spur. Anther about as long as the rostellum. Pollinia granular, pendent. Capsule ellipsoid to oblong. [Greek, referring to the pouch-like spur.] About 60 species, natives of tropical and subtropical regions. Type species: *Orchis plantaginea* Willd.

Sepals about 6 mm. long; spur narrowly obovoid.
Sepals about 3 mm. long; spur linear-cylindric.

1. *P. plantagineus*.
2. *P. hirtellus*.

1. **Physurus plantagineus** (L.) Lindl. Gen. & Sp. Orch. 503. 1840.*Satyrium plantagineum* L. Syst. ed. 10, 1244. 1759.

Stem stout, fleshy, decumbent, erect or ascending, 1 m. long or less, or, exceptionally up to 2 m. long, often rooting at the lower nodes, glabrous and leafy below, hirsute and bearing a few scales above. Leaves elliptic to oblong-lanceolate, 7-15 cm. long, the apex acute or short-acuminate, the base narrowed into a flat sheathing petiole 2-5 cm. long; spike 6-15 cm. long, densely many-flowered; bracts lanceolate, acuminate, pilose, mostly shorter than the white flowers; sepals oblong, obtuse, 6 mm. long; petals spatulate, obtuse; lip linear-spatulate, its middle lobe recurved, the spur obovoid, rounded, about 4 mm. long; capsule about 8 mm. long.

Forests, in wet or moist districts, Porto Rico, ascending high into the Luquillo Mountains:—Jamaica; Cuba; Hispaniola; Saba and Guadeloupe to Trinidad.

2. **Physurus hirtellus** (Sw.) Lindl. Gen. & Sp. Orch. 501. 1840.*Satyrium hirtellum* Sw. Prodr. 118. 1788.

Stem slender, rooting at the lower nodes, 2.5-4 dm. high, glabrous and leafy below, pilose and bearing a few acute scales above. Leaves 3-8, ovate or the upper lanceolate, the blade 3-6 cm. long, the apex acute, the base narrowed, the slender sheathing petiole 1-2 cm. long; spike densely many-flowered, 3-10 cm. long; bracts small, lanceolate, acuminate, shorter than the white flowers; sepals and petals similar, linear, obtuse, about 3 mm. long; lip oblong, a little longer than the sepals, its middle lobe short, recurved; spur linear, obtuse, about 2 mm. long; capsule about 6 mm. long.

In forests at middle and higher elevations in wet or moist districts, Porto Rico: Tortola:—Jamaica; Cuba; Guadeloupe to Trinidad.

A specimen collected by Mrs. Britton and Miss Marble near Mayaguez in March, 1906, may represent another species of *Physurus*, related to *P. hirtellus*, but glabrous throughout and with smaller leaves and flowers.

13. **CRANICHIS** Sw. Prodr. 8. 1788.

Terrestrial orchids, with coarsely fibrous roots, broad basal leaves, slender scapes bearing small or foliaceous scales and small flowers in a terminal spike or spike-like raceme. Sepals distinct, nearly equal. Petals narrow. Lip undivided, free, turned inward. Column short; rostellum often as long as the column. Anther erect; pollinia granular. Capsule ovoid or oblong. [Greek, helmet.] About 20 species, natives of tropical America, the following typical.

1. **Cranichis muscosa** Sw. Prodr. 120. 1788.

Glabrous; basal leaves 3-6, tufted, the blades elliptic to ovate, 2.5-6 cm. long, the apex acute or obtuse, the base narrowed or rounded; petioles flat, margined, somewhat shorter than the blades. Scape 1.5-4 dm. high, erect, bearing below 1 or 2 sessile, suborbicular foliaceous scales 1 cm. broad or less, and several small narrow scales above; spike densely many-flowered, 8 cm. long or less; bracts lanceolate, acuminate, shorter than the white flowers; sepals about 2 mm. long, acute; petals narrowly spatulate; lip a little shorter than the sepals, broadly ovate, obtuse, hooded; capsule 7-8 mm. long.

Forests and shaded banks, Porto Rico, in wet or moist districts at lower and middle elevations; St. Thomas:—Florida; Jamaica; Cuba; Montserrat; Guadeloupe, Dominica; Martinique; St. Vincent; Grenada; Trinidad; Venezuela.

14. **PRESCOTTIA** Lindl. in Hook. Exot. Fl. *pl.* 115. 1825.

Terrestrial orchids, with clustered roots, erect scape-like stems, broad tufted basal leaves convolute in the bud and small flowers in a terminal spike. Sepals broad, connate at the base. Petals narrow, thin, mostly shorter than the sepals. Lip broad, concave, 2-auricled at the base of the blade, free, erect. Column short; rostellum retuse, as long as the anther or longer. Pollinia powdery. Capsule small, oblong or ovoid. [Commemorates John D. Prescott, English botanist, died 1837.] About 30 species, of tropical and subtropical America. Type species: *Prescottia plantaginifolia* Lindl.

Leaf-blades 6-25 cm. long; sepals about 4 mm. long.
Leaf-blades 6 cm. long or less; sepals 1-2 mm. long.

1. *P. stachyoides*.
2. *P. oligantha*.

1. **Prescottia stachyoides** (Sw.) Lindl. Bot. Reg. sub *pl.* 1915. 1834.

Cranichis stachyoides Sw. Prodr. 120. 1788.

Glabrous; scape rather stout, 3-8 dm. high, bearing several narrow sheathing scales. Basal leaves 2 or 3, erect, the blades elliptic to elliptic-ovate, 6-25 cm. long, acute, short-acuminate or obtuse at the apex, rounded or obtuse at the base, about as long as the slender petioles; spike slender, densely many-flowered, 3 dm. long or less; flowers green; bracts ovate, acuminate, 5-9 mm. long; sepals about 4 mm. long, oblong; petals linear, obtuse; lip ovate, obtuse, hooded, about 6 mm. long; capsule nearly 10 mm. long.

Primaeval mountain forests, Porto Rico, at higher elevations; St. Jan:—Jamaica; Cuba; Hispaniola; Guadeloupe to Grenada; continental tropical America.

2. **Prescottia oligantha** (Sw.) Lindl. Gen. & Sp. Orch. 454. 1840.

Cranichis oligantha Sw. Prodr. 120. 1788.

Scape slender, glabrous, 2-4 dm. high. Basal leaves few, ovate to elliptic, 2-7.5 cm. long, acute or obtuse at the apex, obtuse or narrowed at the base, about 13-nerved, the petioles 1.5-3 cm. long; scape with several narrow acute bladeless sheaths 1-3 cm. long; spike slender, densely flowered, 2-7 cm. long; bracts ovate-lanceolate, acuminate, 2-3 mm. long; sepals 1-nerved, pinkish, rounded, about 1 mm. long; petals narrowly obovate or oblong, obtuse, a little shorter than the sepals, white or pink; lip 3-nerved, 1-1.5 mm. long, the blade roundish, minutely auricled; capsule about 4 mm. long.

Forests and shaded banks in wet or moist districts, ascending to 900 m., Porto Rico; St. Thomas; St. Jan; Tortola:—Florida; Bahamas; Jamaica; Cuba; Montserrat; Guadeloupe; Dominica.

15. **PONTHIEVA** R. Br. in Ait. Hort. Kew. ed. 2, 5: 199. 1813.

Terrestrial orchids with fibrous roots, tufted basal leaves, and small, loosely racemose flowers, on sheathed erect scapes. Sepals spreading, the lateral ones slightly inequilateral. Petals clawed, spreading, nearly triangular, adnate to the short column, unsymmetrical. Lip adnate to the column, clawed, concave, ascending, spurless. Anther shorter than the rostellum; pollinia 4, in pairs, powdery, pendulous. Capsule ellipsoid. [Commemorates de Ponthieu, who sent American plants to Sir Joseph Banks.] About 20 species, of tropical and warm temperate America. Type species: *Neottia glandulosa* Sims.

Petals ciliate.
Petals glabrous.

1. *P. racemosa*.
2. *P. ventricosa*.

1. **Ponthieva racemosa** (Walt.) Mohr, Contr. U. S. Nat. Herb. 6: 460. 1901.

Arethusa racemosa Walt. Fl. Car. 222. 1788.

Neottia glandulosa Sims, Bot. Mag. pl. 842. 1804.

Ponthieva glandulosa R. Br. in Ait. Hort. Kew. ed. 2, 5: 200. 1813.

Scape rather slender, glabrous below, densely glandular-pubescent above, 1.5–6 dm. high, bearing several sheathing scales, the lower ones foliaceous, sometimes 3–4 cm. long. Basal leaves 2–6, the blades oblong or oblong-lanceolate, 6–15 cm. long; the apex acute, the base narrowed into a petiole 7 cm. long or less; raceme loosely several-many-flowered, sometimes 2 dm. long, usually shorter; bracts linear-lanceolate, shorter than the green flowers; pedicels and ovary glandular-pubescent, together 1–2 cm. long; sepals glandular-pubescent, about 7 mm. long; petals ciliate, oblique, obtuse; lip long-clawed, white, rounded, apiculate; capsule about 1.5 cm. long.

Forests and thickets in wet or moist districts, Porto Rico, at lower and middle elevations; St. Thomas; St. Jan; Tortola:—Southeastern United States; Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; Grenada.

2. **Ponthieva ventricosa** (Griseb.) Fawcett & Rendle, Fl. Jam. 1: 39. 1910.

Cranichis ventricosa Griseb. Fl. Br. W. I. 639. 1864.

Scape slender, 2–4.5 dm. high, glabrous below, glandular-pubescent above, bearing a few small acute scales. Leaves 3–6, all basal, elliptic, sessile or very nearly so, obtuse or acutish, 2–8 cm. long; raceme 4–8 cm. long, few-several-flowered; flowers white; bracts ovate, acute, much shorter than the flowers; sepals about 6 mm. long; petals obovate-oblong, clawed, 2-lobed; lip sessile, 3-denticulate; capsule about 7 mm. long. [*Cranichis pauciflora* of Bello, not of Swartz.]

Shaded banks and cliffs at lower and middle elevations in wet parts of the central and western districts, Porto Rico:—Jamaica; Cuba; Hispaniola.

16. **CORYMBORCHIS** Thou. Orch. Iles Afr. Tabl. pl. 37. 1822.

Terrestrial orchids with fibrous roots, leafy stems, and large flowers in axillary or terminal corymbs or panicles, the leaves plicate-nerved, convolute in the bud. Sepals and petals similar, narrow, more or less connivent or coherent. Lip free, erect, linear, undivided. Column erect, terete, clavate, 2-lobed. Anther narrow, erect, acuminate, about as long as the rostellum; pollinia granular. Capsule linear or oblong. [Greek, corymbed-orchid.] About a dozen species, natives of tropical regions. Type species: *Corymborchis corymbosa* Thou.

1. **Corymborchis flava** (Sw.) Kuntze, Rev. Gen. Pl. 658. 1891.*Serapius flava* Sw. Prodr. 119. 1788.*Chloïdia flava* Rehb. f. in Walp. Ann. 6: 644. 1863.*Corymbis flava* Hemsl. Biol. Cent. Amer. 3: 297. 1884.

Glabrous; stem stout, stiff, erect, 2 m. high or less, densely leafy, at least above. Leaves oblong, strongly 7-9-nerved, subsessile, 1.5-4 dm. long, 3-6 cm. wide, the apex long-acuminate, the base narrowed; panicles axillary, nearly sessile, 4-10 cm. long; bracts ovate, 4-10 mm. long; flowers nearly sessile, yellow; sepals linear, 2-2.5 cm. long; petals narrowly spatulate, a little shorter than the dorsal sepal; lip about as long as the petals, linear below, dilated above, acute.

Primaeval forests of the central mountains of Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe; Central America.

17. **MALAXIS** Sw. Prodr. 119. 1788.

Low terrestrial orchids with a solid bulb, 1-leaved or 2-leaved. Flowers small, white or green, in a terminal raceme. Sepals spreading, separate, the lateral ones equal at the base. Petals filiform or linear, spreading. Lip cordate or auricled at the base, embracing the column. Anther erect between the auricles, 2-celled; pollinia 4, smooth and waxy, 2 in each sac, the pairs cohering at the summit, without caudicles or glands. Capsule oval, sometimes nearly globular, beakless. [Greek, in allusion to the soft tissues.] About 140 species, widely distributed, the following typical.

1. **Malaxis spicata** Sw. Prodr. 119. 1788.*Microstylis spicata* Lindl. Gen. & Sp. Orch. 19. 1830.

Glabrous, 1-3 dm. high, 2-leaved near the base, and with 1 or 2 sheaths below the leaves. Leaves ovate or elliptic-ovate, 5-10 cm. long, acute, the lower one the larger, the sheathing petioles 1-5 cm. long; raceme narrow, 8 cm. long or less, many-flowered; bracts ovate or ovate-lanceolate, acute, 2-4 mm. long; pedicels 5-9 mm. long; middle sepal about 3 mm. long, ovate-lanceolate, acute or bluntish, the lateral ones about as long, obtuse; petals linear, 2 mm. long; lip about 4 mm. long, its terminal lobe linear-oblong; capsule about 8 mm. long.

Wet woods and river banks at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Martinique.

18. **LIPARIS** L. C. Rich. Mem. Mus. Paris 4: 43, 60. 1817.

Low terrestrial orchids with solid bulbs, the base of the stem sheathed by several scales, and one or more fleshy broad shining leaves. Flowers in a terminal raceme. Sepals and petals nearly equal, linear, spreading, petals usually very narrow. Column elongated, incurved, thickened and margined above. Pollinia 2 in each sac of the anther, smooth and waxy, the pairs slightly united, without stalk, threads or glands. Lip nearly flat, often bearing 2 tubercles above the base. [Greek, fat, referring to the texture of the leaves.] One hundred species or more, natives of temperate and tropical regions. Type species; *Ophrys Loeselii* L.

Leaves 2 or several; lip emarginate.

Sepals obtuse; leaves several.

Sepals acute; leaves 2 or 3.

Leaf only 1; lip obtuse.

1. *L. elata*.2. *L. Eggersii*.3. *L. verillifera*.

1. *Liparis elata* Lindl. Bot. Reg. **14**: pl. 1175. 1828.

Glabrous; bulb narrowly ovoid-conic, about 3 cm. long. Scape slender, rather stiff, erect, 2-5 dm. high, bearing a few small scales; leaves elliptic to oblong, 7-20 cm. long, 2-7 cm. wide, the apex acute, the base sheathing; raceme several-many-flowered, 15 cm. long or less; bracts lanceolate, shorter than the purplish flowers; pedicels 2-6 mm. long; sepals oblong, obtuse, 5-7 mm. long, the dorsal one a little longer and narrower than the lateral ones; petals narrowly linear, obtuse, as long as the dorsal sepal; lip obovate, emarginate, about 5 mm. long, 2-callous at the base; capsule oblong-obovoid, 10-15 mm. long.

Woodlands, thickets and shaded hillsides, Porto Rico, at lower and middle elevations in moist districts; St. Thomas:—Florida; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

2. *Liparis Eggersii* Rchb. f. Ber. Deutsch. Bot. Gesell. **3**: 278. 1885.

Similar to *L. elata*, about as large, but with fewer and somewhat narrower leaves, the raceme with fewer flowers, their bracts longer; sepals acute, the dorsal one 6 mm. long.

Woods on Monte Mesa, Mayaguez (according to Reichenbach); St. Thomas. Endemic. Perhaps not distinct from the preceding species. St. Thomas is the type locality.

3. *Liparis vexillifera* (Ll. & Lex.) Cogn. in Mart. Fl. Bras. **3**⁴: 289. 1895.

Cymbidium vexilliferum Ll. & Lex. Nov. Veg. Descr. **2**: 11. 1825.

Liparis elliptica Rchb. f. in Walp. Ann. **6**: 218. 1861.

Glabrous; bulb ovoid, 1-2 cm. long. Scape slender, angular, 2.5 dm. high or less. Leaf solitary, basal, erect, oblong-lanceolate, 7-13 cm. long, 2.5 cm. wide or less, the base sheathing; raceme rather densely several-many-flowered, 2-8 cm. long, the rachis narrowly 3-winged; bracts lanceolate, shorter than the yellowish flowers; sepals acute, the dorsal one about 8 mm. long, the lateral ones about 6 mm. long; petals narrowly linear, obtuse, about 7 mm. long; lip ovate, obtuse, 7-10 mm. long.

Grassy banks at higher elevations in the central and western mountains, of Porto Rico:—Cuba; Jamaica; Trinidad; continental tropical America.

19. **POLYSTACHYA** Hook. Exot. Fl. pl. 103. 1825.

Epiphytic, leafy-stemmed orchids, the stems usually clustered, sheathed at the base, the roots thick-fibrous, the many-nerved leaves conduplicate in the bud, the upper reduced to long narrow scales, the small flowers in terminal panicles or spike-like racemes. Median sepal narrower than the lateral ones. Petals narrower than the lateral sepals. Lip jointed with the base of the column, spurless, sessile, bent below, 3-lobed, the lateral lobes small. Column short, with a distinct foot. Anther terminal, lid-like, convex, usually 1-celled; pollinia 4, waxy, broadly ovate or nearly hemispheric, not appendaged. [Greek, many spikes.] About 170 species, mostly of tropical regions. Type species: *Cranichis luteola* Sw.

Flowers about 4 mm. long; capsule 10-12 mm. long.

1. *P. minuta*.

Flowers about 3 mm. long; capsule 6-8 mm. long.

2. *P. minor*.

1. *Polystachya minuta* (Aubl.) Britton; Small, Fl. SE. U. S. 328, 1329. 1903.

Epidendrum minutum Aubl. Pl. Guian. **2**: 824. 1775.

Dendrobium polystachyum Sw. Act. Holm. **21**: 247. 1800.

Cranichis luteola Sw. Fl. Ind. Occ. **3**: 1433. 1806.

Polystachya luteola Hook. Exot. Fl. pl. 103. 1825.

Stems rather slender, 2-6 dm. long. Sheaths many-striate, 2-4 cm. long; leaves oblong or linear-oblong, 6-30 cm. long, 1-3 cm. wide, acute or obtuse,

shorter than the stem; panicle 3 dm. long or less, sometimes reduced to a single raceme; racemes rather densely several-many-flowered; bracts acute, about 2 mm. long; flowers greenish-yellow; buds obliquely 3-angled; median sepal ovate, 3-4 mm. long, the lateral ones oblique, a little longer; petals narrowly spatulate, shorter than the sepals; lip about 4 mm. long, glandular-hairy within, the median lobe emarginate, the lateral lobes incurved; capsule 10-12 mm. long.

On trees, in moist districts, Porto Rico, mostly at middle and higher elevations: St. Thomas;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; St. Kitts and Montserrat to Trinidad; continental tropical America.

2. **Polystachya minor** Fawcett & Rendle, Journ. Bot. 48: 106. 1910.

Similar to the preceding species, but usually smaller, and with smaller leaves. Flowers smaller, the median sepal rather less than 3 mm. long; lip with a conic callus at the base; capsule 6-8 mm. long.

Base of a mango tree, Sierra de Naguabo (*Shafer 3421*):—Jamaica; Cuba; British Guiana. Perhaps better regarded as a race of *P. minuta*.

20. **ISOCHILUS** R. Br. in Ait. Hort. Kew. ed. 2, 5: 209. 1813.

Leafy epiphytic orchids, with creeping rootstocks and rather large flowers in terminal racemes, the leaves narrow, distichous. Sepals distinct, equal. Petals as long as the sepals. Lip flexuous, about as long as the petals. Column elongated, wingless, with a short foot. Anther incumbent, operculate, 2-celled; pollinia 4, waxy, ovoid-oblong, flattened, appendaged or caudiculate. Capsule ovoid or subglobose. [Greek, equal lip.] About 5 species, of tropical America, the following typical.

1. **Isochilus linearis** (Jacq.) R. Br. in Ait. Hort. Kew. ed. 2, 5: 209. 1813.

Epidendrum lineare Jacq. Enum. 29, 1760.

Glabrous; stems commonly clustered, straight, densely leafy, slender, simple, 2-4.5 dm. long. Leaves linear, nearly erect, 2-5 cm. long, 2-4 mm. wide, sessile, obtuse or emarginate; raceme sessile, densely few-flowered, 2-3 cm. long; bracts obovate, 6-10 mm. long, acute; flowers rose or purple, nearly sessile; sepals 7-10 mm. long, acute, the dorsal one free, the lateral ones connate, carinate; petals oblong-spatulate, acute; lip lanceolate-spatulate, narrowed to the base.

On trees and rocks in forests of the central and western districts of Porto Rico, mostly at higher elevations:—Jamaica; Cuba; Hispaniola; Montserrat to Trinidad; continental tropical America.

21. **TETRAGAMESTUS** Rehb. f. Bonplandia 2: 21. 1854.

Epiphytic orchids, with jointed branched stems, the branches mostly 2-foliolate, the small fleshy bracted flowers glomerate or geminate at the bases of the narrow coriaceous leaves. Pseudobulbs slender. Sepals distinct. Petals similar to the sepals. Lip entire or 3-lobed. Column short. Anther terminal, operculate, 2-celled; pollinia 4, waxy, ovoid, flattened, appendiculate. Capsule fusiform. [Greek, referring to the four pollinia.] A few species, natives of tropical America, the following typical.

1. **Tetragamestus modestus** Rehb. f. Bonplandia 2: 21. 1854.

Glabrous; stems stout, clustered, 5 dm. long or less, the joints 5-20 cm. long. Leaves narrowly oblong-lanceolate, sessile, acute, 6-15 cm. long, 2 cm. wide or

less; flowers 2-several in the fascicles, greenish white; bracts thin, acute, 5–10 mm. long; sepals about 5 mm. long, the dorsal one obtuse, the lateral ones acute; petals oblong, obtuse; lip ovate, clawed, 3-lobed.

On trees Luquillo Mountains and near Arecibo, Porto Rico:—Hispaniola; Martinique; Grenada. Recorded from Brazil.

22. **OCTADESMIA** Benth. Journ. Linn. Soc. 18: 311. 1881.

Epiphytic orchids, with simple leafy stems, and rather large flowers in a terminal raceme; pseudobulbs none. Leaves articulated at the base of the blade. Sepals equal in length, the middle one free, the lateral ones coherent below. Petals similar to the sepals. Lip 3-lobed, free, crenulate, about as long as the sepals. Column wingless, with a short foot. Anther operculate, 2-celled; pollinia 8. Capsule oblong. [Greek, referring to the eight pollinia.] Two known species, natives of the West Indies. Type species: *Octomeria serratifolia* Hook .f.

1. **Octadesmia montana** (Sw.) Benth. Journ. Linn. Soc. 18: 311. 1881.

Epidendrum montanum Sw. Prodr. 121. 1788.

Octomeria serratifolia Hook. f. Bot. Mag. pl. 2823. 1828.

Stems solitary or few together, rather stout, stiff, somewhat flattened, 4 dm. high or less, leafy above. Leaves lanceolate or oblong-lanceolate, entire, or the upper ones denticulate, firm in texture, 4–8 cm. long, 6–12 mm. wide; peduncle slender, elongated; raceme few-flowered, 10 cm. long or less; pedicels about 1 cm. long; bracts narrow, acuminate, 6–12 mm. long; sepals and petals narrowly lanceolate, yellowish, 12–15 mm. long; lip oblong-obovate, white, about 9 mm. long; capsule nearly 2 cm. long.

On trees, shrubs and logs at high elevations in the eastern mountains of Porto Rico, ascending to the summit of El Yunque:—Jamaica; Cuba; Hispaniola.

23. **HORMIDIUM** Lindl.; Heynh. Nom. 1: 880. 1840.

Small epiphytic orchids, with creeping, freely rooting, scaly stems, and short terete or flattened pseudobulbs bearing 1 or 2 leaves and few or solitary, small terminal flowers. Sepals equal, the lateral ones adnate at the base, the middle one free. Petals similar to the middle sepal, or narrower. Lip undivided or 3-lobed. Column short, adnate to the lip. Anther terminal, operculate, 4-celled; pollinia 4, waxy, unappendaged. Capsule ovoid or subglobose, strongly ribbed or narrowly winged. [Greek, necklace.] About 7 species, natives of tropical America. Type species: *Epidendrum uniflorum* Lindl.

1. **Hormidium tripterum** (Brongn.) Cogn. in Mart. Fl. Bras. 3⁵: 29. 1898.

Coelogyne triptera Brongn. Voy. Coquile 201. 1829.

Glabrous; stems rather stout, creeping, up to 3 dm. long. Pseudobulbs 1–3 cm. apart, terete, subfusiform, 3–4 cm. long, 2-leaved at the summit; leaves oblong or oblong-lanceolate, 2–5 cm. long, sessile, acute, entire, fleshy; flowers few or solitary, greenish, nearly sessile; sepals lanceolate, acute, about 5 mm. long; petals linear-lanceolate, acute, a little shorter than the sepals; lip reniform, white, 3-lobed, the lateral lobes rounded.

On rocks among mosses, Porto Rico, at middle and higher elevations in the central mountains:—Florida; Jamaica; Cuba; Trinidad; continental tropical America.

24. **JACQUINIELLA** Schlechter, Repert. Beihefte 7: 124. 1920.

Leafy, relatively small, epiphytic orchids, the leaves linear or subterete; pseudobulbs none; flowers solitary, fascicled, racemose or spicate, terminal. Sepals linear to ovate, distinct or the lateral ones connate at the base, more or less fleshy. Petals filiform to ovate, about as long as the sepals. Lip entire or 3-lobed. Column free from the lip, without a foot. Pollinia 4, waxy, caudiculate. Fruit a small capsule. [Diminutive of *Jacquinia*.] A few species of tropical America, the following typical.

1. **Jacquiella globosa** (Jacq.) Schlechter, Repert. Beihefte 7: 124. 1920.

Epidendrum globosum Jacq. Enum. 29. 1760.

Isochilus globosum Lindl. Gen. & Sp. Orch. 112. 1831.

Glabrous; stems clustered, often numerous, slender, several-leaved, 5–15 cm. long. Leaves distichous, linear, fleshy, semiterete, channelled above, sessile, 1.5–2 cm. long, 1–1.5 mm. thick; flowers solitary or few, terminal, deflexed, nearly sessile; bracts 1–1.5 mm. long; sepals elliptic, about 3 mm. long; petals subrhomboid, obtusely angled, a little shorter than the sepals; lip rhomboid, entire, obtuse, about 2.5 mm. long; capsule globose-ellipsoid, about 6 mm. long.

On trees in mountain forests, Porto Rico, at higher elevations:—Jamaica; Cuba; Saba and St. Kitts to Trinidad; continental tropical America.

25. **ENCYCLIA** Hook. Bot. Mag. pl. 2831. 1828.

[LARNANDRA Raf. Neog. 4. Hyponym. 1825.]

Epiphytic or rarely terrestrial orchids, with mostly terete, short or elongated pseudobulbs, flat, mostly stiff, elongated narrow leaves duplicate in the bud, and rather large, racemose or panicled bracted flowers on a long terminal scape. Lateral sepals broad or narrow, about as wide as the similar median one; petals spatulate to linear. Lip longitudinally crested or appendaged, 3-lobed, the middle lobe much wider than the lateral ones, often emarginate. Column usually adnate to the lip at its base and sometimes enclosed by it. Capsule ribbed. [Greek, wrapped around.] Perhaps 75 species, of tropical and subtropical America. Type species: *Encyclia viridiflora* Hook.

Middle lobe of the lip acute or tipped.

Panicle several-many-flowered; ovary smooth.

Panicle few-flowered; ovary warty.

Middle lobe of the lip 2-lobed.

1. *E. fucata*.

2. *E. Sintenisii*.

3. *E. papilionacea*.

1. **Encyclia fucata** (Lindl.) Britton & Millspaugh, Bahama Fl. 91. 1920.

Epidendrum fucatum Lindl. Bot. Reg. 24: Misc. 15. 1838.

Pseudobulbs slender, ovoid to oblong, 2–5 cm. long. Leaves 1 or 2, linear, 1–3 dm. long, 1–2.5 cm. wide; scape slender, usually branched, 3–7 dm. long; pedicels slender or filiform, 1–2 cm. long; sepals yellow or brownish yellow, oblong or oblong-oblancoelate, obtuse, 1.5–2 cm. long; petals oblancoelate, similar to the sepals but a little shorter; lip yellow, 3-lobed, the lateral lobes oblong, obtuse, about 1 cm. long, the middle lobe suborbicular, tipped; column wingless; capsule oblong, 1.5–2.5 cm. long.

On trees in coffee plantations near Adjuntas and Lares, Porto Rico (according to Cogniaux); Bahamas; Cuba; Hispaniola.

2. **Encyclia Sintenisii** (Rchb. f.) Britton.

Epidendrum Sintenisii Rchb. f. Ber. Deutsche Bot. Gesell. 3: 277. 1885.

Pseudobulbs ovoid, narrowed above, 3–4.5 cm. long. Leaves 2 or 3, linear, 2.5–3.5 dm. long, 10–13 mm. wide, obtuse or emarginate; scape slender, branched

above, 2–3 dm. long, bearing a few scarious sheaths; pedicels very slender, 1–1.5 cm. long; ovary verrucose; sepals and petals lanceolate, acute, about 1 cm. long; middle lobe of the lip triangular, acuminate.

On trees, near Maricao, collected only by Sintenis, flowering in December. Endemic.

3. **Encyclia papilionacea** (Vahl) Schlechter, Repert. Beihefte **6**: 74. 1919.

Epidendrum papilionaceum Vahl; West, St. Croix 303. 1793.

Epidendrum bifidum Sw. Fl. Ind. Occ. 1489. 1806. Not Aubl., 1779.

Epidendrum Kraenzlinii Bello, Anales Soc. Esp. Hist. Nat. **12**: 116. 1883.

Epidendrum Krugii Bello, Anales Soc. Esp. Hist. Nat. **12**: 117. 1883.

E. papilionaceum grandiflorum Cogn. in Urban, Symb. Ant. **6**: 505. 1910.

Pseudobulbs narrowly oblong, solitary or clustered, 6–12 cm. long. Leaves 2 or 3, linear or linear-lanceolate, stiff, 2.5 dm. long or less, 7–25 mm. wide; scape slender or rather stout, 0.5–2 m. long, simple, or forked above, bearing several scarious sheaths; racemes several-many-flowered, short or elongated; pedicels filiform, 1–3 cm. long; bracts triangular-lanceolate, 3–8 mm. long; flowers light purple; sepals narrow, 10–15 mm. long; petals a little narrower than the sepals; lip 1.5–3 cm. long, deeply 3-lobed, the middle lobe deeply emarginate; capsule oval, about 2 cm. long.

On shrubs and in sandy or rocky ground at lower elevations, Porto Rico, mostly near the coasts; Mona; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Hispaniola; St. Barts and St. Kitts. Recorded by Millspaugh as *Laelia domingensis*.

26. **ANACHEILUM** Hoffmg. Linnaea **16**: Litt. Ber. 229. 1842.

Epiphytic orchids, with elongated, somewhat flattened pseudobulbs, long flat leaves duplicate in the bud, and nodding racemose bracted flowers on a simple terminal scape. Sepals all nearly alike, elongated, narrow, acuminate. Petals similar to the sepals, but somewhat shorter; lip concave, entire, much shorter than the sepals. Column partly adnate to the lip, footless. Capsules winged, drooping. [Greek, upturned lip.] The genus is probably monotypic.

1. **Anacheilium cochleatum** (L.) Hoffmg. Linnaea **16**: Litt. Ber. 229. 1842.

Epidendrum cochleatum L. Sp. Pl. ed. 2, 1351. 1763.

Pseudobulbs lanceolate to ovate, compressed, 8–12 cm. long, clustered. Leaves 2 or 3, linear or linear-oblong, acute, 1–4 dm. long; scape simple, 1.5–6 dm. long, bearing several linear-lanceolate scarious scales 1–3 cm. long and subtended by a larger, scarious, spathe-like scale 5–8 cm. long; flowers few-several, racemose; bracts small; lateral sepals linear-lanceolate, greenish yellow, 2–3 cm. long, similar to the petals; lip purple or variegated, about 2 cm. long, abruptly acute, entire; capsule 2–3 cm. long.

On trees and rocks in moist districts, Porto Rico; Vieques; St. Croix;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Central America; northern South America.

27. **NIDEMA** Britton & Millspaugh, Bahama Fl. 94. 1920.

Epiphytic orchids, with flattened 1-leaved pseudobulbs subtended by narrow scales, the leaves narrowly linear, the slender scapes bearing several, rather small, racemose flowers, or but one. Lateral sepals lanceolate or linear-lanceolate, 3–5-nerved, acute or acuminate; petals linear to lanceolate, somewhat shorter than the sepals; lip linear or ligulate, somewhat fleshy, entire or undulate; column free from the lip or but slightly adnate at the base, footless. Capsule oblong. [Anagram of *Dinema*, a related genus.] Two species or more, natives of the West Indies, the following typical.

1. **Nidema Ottonis** (Rchb. f.) Britton & Millspaugh, Bahama Fl. 94. 1920.

Epidendrum Ottonis Rchb. f.; Griseb. Fl. Br. W. I. 613. 1864.

Pseudobulbs narrowly oblong, clustered, compressed, 2–3.5 cm. long, 1-leaved. Leaf thin in texture, linear, 6–13 cm. long, 5–8 mm. wide, obtuse or acutish; scape very slender, little, if any, longer than the leaf, bearing several linear scales and 3–6 bracted whitish flowers; ovary shorter than the linear bract; sepals lanceolate, acuminate, about 8 mm. long; petals linear, acute, about 6 mm. long; lip linear, acute, undivided, about 5 mm. long; column free, claviform, 4 mm. long, 5-toothed; capsule oblong, about 1 cm. long.

On palm trunks near Utuando and Arecibo, Porto Rico;—Jamaica; Cuba; Hispaniola; Trinidad and Venezuela.

28. **AULIZA** Salisb. Trans. Hort. Soc. 1: 294. 1812.

Epiphytic or terrestrial orchids, with erect or ascending, often clustered stems, subcoriaceous sessile leaves and rather large pedicelled flowers on scapes; pseudobulbs elongated. Sepals often elongated. Petals linear to spatulate. Lip various. Column adnate to the lip. Pollinia 4, appendaged. [Greek, perching.] A few species of tropical and subtropical America. Type species: *Epidendrum ciliare* L.

1. **Auliza ciliaris** (L.) Salisb. Trans. Hort. Soc. 1: 294. 1812.

Epidendrum ciliare L. Syst. ed. 10, 1246. 1759.

Epidendrum cuspidatum Lodd. Bot. Cab. 1818; pl. 10.

E. ciliare cuspidatum Lindl. Fol. Orch. Epid. 30. 1853.

Pseudobulbs 8–20 cm. long, slender, thickened upward, usually clustered, 1–2 cm. thick at the top. Leaves 1–3, usually 2, thick, narrowly oblong, obtuse, 1–2 dm. long, 2–5 cm. wide; scape rather stout, 3 dm. long or less, bearing large, linear-lanceolate, imbricated scales below, few—several-flowered; bracts lanceolate, 2.5–5 cm. long; pedicels 1–2 cm. long; ovary slender, 4–5 cm. long; sepals linear-lanceolate, yellowish-green, acuminate, 4–5 cm. long; petals similar to the sepals; lip deeply 3-cleft, white, 3–4 cm. long, the outer segments ciliate, the middle one subulate, entire.

On shaded rocks and on trees in both dry and moist districts, Porto Rico, ascending to 750 meters in the western mountains; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—St. Martin to Trinidad; continental tropical America.

29. **AMPHIGLOTTIS** Salisb. Trans. Hort. Soc. 1: 294. 1812.

[NYCTOSMA Raf. Fl. Tell. 2: 9. 1837.]

Epiphytic or rarely saxicolous orchids, without pseudobulbs, the stems leafy, the flowers umbellate, racemose or paniced. Sepals nearly alike, distinct. Petals similar to the sepals. Lip 3-lobed or entire. Column wholly adnate to the lip. Anther 2-celled, operculate; pollinia 4, waxy. Capsule oblong. [Greek, encircling a tongue.] Seventy-five species or more, natives of tropical and subtropical America. Type species: *Epidendrum elongatum* Jacq.

Flowers umbellate, subumbellate or solitary.

Flowers subumbellate.

Lip 4-lobed.

Lip undulate, subtruncate.

Flowers only 1 or 2; lip 3-lobed.

Flowers racemose or paniculate.

Flowers racemose; lip 3-lobed.

Lobes of the lip entire.

Lobes of the lip lacerate or denticulate.

Petals oblong; stem terete.

Petals linear-ligulate; stem flattened.

Flowers paniculate; lip 3-lobed, the lobes rounded.

1. *A. difformis*.
2. *A. corymbosa*.
3. *A. nocturna*.
4. *A. anceps*.
5. *A. secunda*.
6. *A. lacra*.
7. *A. pallidiflora*.

1. *Amphiglottis difformis* (Jacq.) Britton.*Epidendrum difforme* Jacq. Enum. 29. 1760.*Epidendrum umbellatum* Sw. Prodr. 121. 1788.

Stems commonly clustered, leafy nearly to the base, 4 dm. long or less, flattened and winged above. Leaves oblong or linear-oblong, obtuse or retuse, 3-7 cm. long; flowers greenish-white to yellow, fragrant, few or several in a sessile terminal umbel; pedicels 1-2 cm. long, slender; ovary slender, about as long as its pedicel; sepals oblong, 1-2.5 cm. long; petals linear, acute, about as long as the sepals; lip reniform, 1.5-3 cm. broad, 4-lobed, the lobes entire-margined; capsule about 2 cm. long and 1 cm. thick.

On trees and rocks in mountain forests, Porto Rico, at middle and higher elevations;—Florida; Jamaica; Cuba; Hispaniola; St. Eustatius to Trinidad; continental tropical America.

2. *Amphiglottis corymbosa* (Lindl.) Britton.*Epidendrum corymbosum* Lindl. Fol. Orch. Epid. 61. 1853.

Stems clustered, sometimes branched, 1.5-3 dm. long, few-leaved above. Leaves thin, oblong, or oblong-lanceolate, acute, 10 cm. long or less, 7-18 mm. wide; peduncle slender, terminal, 2-5 cm. long, subumbellately few-several-flowered; flowers greenish; bracts lanceolate, 3-6 mm. long; pedicels slender, about 1 cm. long; ovary rather longer than its pedicel; sepals lanceolate, acute, about 12 mm. long; petals linear, about as long as the sepals; lip reniform, undulate, subtruncate, about 10 mm. broad; capsule oblong, nearly 2 cm. long.

On trees in forests of the eastern mountains at higher elevations and near Adjuntas, Porto Rico;—Hispaniola; northern South America.

3. *Amphiglottis nocturna* (Jacq.) Britton.*Epidendrum nocturnum* Jacq. Enum. 29. 1760.*Epidendrum tridens* Poepp. & Endl. Nov. Gen. 2: 2. 1838.*E. nocturnum tridens* Cogn. in Mart. Fl. Bras. 3: 136. 1898.*Auliza nocturna* Small, Fl. Miami 56. 1913.

Epiphytic or saxicolous; stems stiff, clustered, rather slender, usually erect, 3-11 dm. high. Leaves oblong to elliptic, oblong-lanceolate or linear-oblong, 7-16 cm. long, acute at the apex, partly clasping at the base, the sheaths cylindrical, the lower ones bladeless; flowers solitary or two together, peduncled, the peduncle 2-10 cm. long; bracts ovate or lanceolate, 3-6 mm. long; lateral sepals green, linear-attenuate, 3-6 cm. long, 2-4 mm. wide; petals yellow, similar to the sepals, but a little narrower; lip white, 3-cleft, the 2 lateral lobes ovate or ovate-oblong, 10-15 mm. long, the middle lobe setaceous, 3-5 cm. long; capsule oblong, narrowed at both ends, 2.5-4 cm. long.

On trees, rocks and on the ground in mountain forests, Porto Rico, at middle and higher elevations;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; Margarita and continental tropical America. Races differ in shape and size of leaves and in size of the floral parts.

4. *Amphiglottis anceps* (Jacq.) Britton.*Epidendrum anceps* Jacq. Stirp. Amer. 224. 1763.

Stems solitary or few together, compressed, 2-edged, 6 dm. long or less, sheathed below, leafy above. Leaves few or several, oblong or oblong-lanceolate, acute, 5-12 cm. long; peduncle slender, sheathed below, the several or many greenish brown flowers in a short, usually dense raceme; pedicels slender, 3-6 mm. long; ovary about as long as the pedicel; bracts ovate, acuminate, 2-5 mm. long; sepals oblong, about 8 mm. long; petals linear-spatulate, a little shorter than the sepals; lip cordate-reniform, about 5 mm. long, 3-lobed, the lobes entire.

On trees and on shaded rocks, Porto Rico, mostly at higher elevations in wet or moist districts;—Florida; Jamaica; Cuba; Hispaniola; Saba and St. Kitts to Barbados and Grenada; continental tropical America.

5. *Amphiglottis secunda* (Jacq.) Britton.*Epidendrum secundum* Jacq. Enum. 29. 1760.*Epidendrum elongatum* Jacq. Icon. Rar. 3: 17. 1786-93.

Stems few together or solitary, slender, naked below, leafy above, terete. 2-9 dm. long. Leaves firm in texture, oblong or lanceolate, acute, 4-12 cm. long, 1-3 cm. wide; peduncle 3 dm. long or less, bearing several sheaths; racemes several-many-flowered; bracts acuminate, 3-8 mm. long; pedicels slender, about 1 cm. long; ovary about 1 cm. long; sepals acute, 7-10 mm. long; petals oblong, about as long as the sepals, rose or purple; lip whitish, broadly reniform, 6-7 mm. wide, deeply 3-lobed, the lobes denticulate, the middle one emarginate; capsule broadly oblong, 2 cm. long.

On trees, rocks and wet banks at higher elevations in moist or wet districts, Porto Rico; St. Thomas (according to Krebs);—Antigua to Trinidad, Margarita and continental South America.

6. *Amphiglottis lacera* (Lindl.) Britton.*Epidendrum lacrum* Lindl. Bot. Reg. 24: Misc. no. 18. 1838.

Stem rather stout, flattened, leafy nearly to the base, 2-8 dm. long. Leaves thin, linear to lanceolate, acutish, 5-8 cm. long, 4-15 mm. wide; peduncle slender, bearing several sheaths 2-4 cm. long; raceme rather densely several-flowered; flowers pale rose; bracts linear-subulate, 3-10 mm. long; pedicels about 1 cm. long; ovary about as long as its pedicel; sepals oblong-lanceolate, about 7 mm. long; petals a little longer and narrower than the sepals; lip deeply 3-lobed, 4-5 mm. long, the lobes nearly equal, lacerate, obovate.

Mountain thickets of Monte Cedro near Adjuntas;—Cuba.

7. *Amphiglottis pallidiflora* (Hook.) Britton.*Epidendrum pallidiflorum* Hook. Bot. Mag. pl. 2980. 1830.

Stem terete and naked below, flattened and several-leaved above, 2-3 dm. long. Leaves thin, oblong or oblong-lanceolate, 5-14 cm. long, 1-2.8 cm. wide; peduncle slender, bearing a few sheaths below, branched above, the inflorescence paniculate, several-flowered; pedicels and ovary together about 1.5 cm. long; bracts acuminate, 8 mm. long or less; flowers pale yellow; sepals lanceolate, 12-14 mm. long; petals lanceolate-spatulate, about as long as the sepals; lip deeply 3-lobed, 7-8 mm. wide, the lobes rounded, nearly equal. [? *Epidendrum nutans* of Bello, not of Swartz.]

On Mount Jimenes, Luquillo Mountains;—Guadeloupe; Dominica; St. Vincent.

Epidendrum patens Sw., a species characterized by a nodding raceme of yellowish flowers, was recorded from Signal Hill, St. Thomas, by Eggers; it has not been found there by subsequent collectors; in the West Indies it is otherwise known only from Jamaica and Trinidad. The record may be erroneous.

30. **SPATHIGER** Small, Fl. Miami 55. 1913.

Epiphytic, usually branched, creeping or pendent glabrous orchids, with slender leafy stems, narrow sessile leaves and small flowers in the axils of spathe-like bracts, forming terminal spikes; pseudobulbs none. Leaves duplicate in the bud, the blades not plaited, jointed at the base. Lateral sepals broader than the median one. Petals scarcely broader than the sepals. Lip reniform or nearly orbicular, concave. Column adnate to the lip. Pollinia 4, appendaged. [Greek, spathe-bearing.] About 10 species of tropical and subtropical America. Type species: *Epidendrum rigidum* Jacq.

Leaves oblong; lip obtuse.
Leaves linear; lip acute.

1. *S. rigidus*.
2. *S. ramosus*.

1. **Spathiger rigidus** (Jacq.) Small, Fl. Miami 55. 1913.

Epidendrum rigidum Jacq. Enum. 29. 1760.

Often much branched, 5 dm. long or less. Leaves oblong or linear-oblong, subcoriaceous, 3–8 cm. long; flowers greenish-white; lateral sepals ovate, about 6 mm. long; petals narrowly spatulate or oblong; blade of the lip about 3 mm. long, suborbicular, obtuse, with callosities near the base; capsule about 1.5 cm. long.

On trees and on rocks, Porto Rico, mostly at middle and higher elevations in wet or moist districts:—Florida; Bahamas; Cuba; Hispaniola; Guadeloupe to Trinidad and Margarita; continental tropical America.

2. **Spathiger ramosus** (Jacq.) Britton.

Epidendrum ramosum Jacq. Enum. 29. 1760.

E. ramosum lanceolatum Griseb. Fl. Br. W. I. 618. 1864.

Branched, sometimes up to 1 m. in length. Leaves linear, coriaceous, those of the stem 6–11 cm. long, about 1 cm. wide or less, those of the branches usually much smaller; flowers greenish or yellowish; sepals 5–7 mm. long; petals linear, about as long as the sepals; lip cordate-ovate, acute, about 4 mm. long; capsule about 1 cm. long.

On trees and rocks, in wet or moist districts, Porto Rico, mostly at higher elevations:—Jamaica; Cuba; Hispaniola; Guadeloupe to Grenada; continental tropical America.

31. **TETRAMICRA** Lindl. Gen. & Sp. Orch. 119. 1831.

Mostly terrestrial orchids, without pseudobulbs, the roots thick fibers, the few subterete fleshy leaves basal, the pink to purple flowers in a simple raceme at the end of a slender sheathed scape or peduncle. Bracts very small. Sepals about equal, distinct, spreading. Petals similar to the sepals. Lip 3-lobed, spreading, the lobes entire or nearly so. Column 2-winged. Anther convex imperfectly 4-celled; pollinia 4, waxy, appendaged. Capsule oblong, beakless. [Greek, small four.] About 8 species, of tropical America. Type species. *Cymbidium rigidum* Willd.

1. **Tetramicra elegans** (Hamilt.) Cogn. in Urban, Symb. Ant. 6: 549. 1910.

Cyrtopodium elegans Hamilt. Prodr. 53. 1825.

Epidendrum subaequale Eggers, Bull. U. S. Nat. Mus. 13: 113. 1870.

Bletia subaequalis Rehb. f. Flora 69: 553. 1886.

Stem short, scaly; peduncle stiff, erect or nearly so, straight or slightly flexuous, 6 dm. long or less, simple, bearing numerous striate sheaths; leaves 1–4, linear-subulate, coriaceous, half-cylindric, pointed, 7–18 cm. long, 2–3 mm. thick; raceme several-flowered, 3–10 cm. long; bracts ovate, striate, acute or acuminate, 3–6 mm. long, the lower ones often flowerless; pedicels filiform, about 1 cm. long; sepals lanceolate-acute, brownish, about 1 cm. long; petals about as long as the sepals but narrower; lip 12–15 mm. long, deeply 3-lobed, rose-colored, the middle lobe obovate, violet-veined.

Indiera Fria near Maricao, Porto Rico (barren); St. Thomas; St. Jan; Anegada; St. Croix:—St. Eustatius; Antigua; Desirade; Guadeloupe.

32. **EPIDENDRUM** L. Sp. Pl. 952. 1753.

Epiphytic or saxicolous orchids, without pseudobulbs, the few leaves fleshy, linear or subterete, the large showy peduncled flowers solitary, geminate or racemose. Sepals distinct, narrow, elongated, the petals similar, the lip very broad, narrowed below or clawed, entire or fimbriate. Column erect, 2-winged. Anther

operculate, 2-celled; pollinia 8, compressed. Capsule mostly oblong. [Greek, on trees.] A few species, of tropical America. Type species: *Epidendrum nodosum* L.

Peduncle 2-3-flowered; lip long-clawed, not fimbriate.
Peduncle 1-flowered; lip short-clawed, fimbriate.

1. *E. nodosum*.
2. *E. cucullatum*.

1. ***Epidendrum nodosum*** L. Sp. Pl. 953. 1753.

Brassavola nodosa Lindl. Gen. & Sp. Orch. 114. 1831.

Roots of thick fibers; stems usually clustered, rather stout, 3-8 cm. long, nearly terete. Leaf solitary, thick, linear, half-cylindric, acute, channeled, 6-15 cm. long, about 1 cm. wide; peduncle slender, as long as the leaves or shorter, 2-3-flowered; pedicels about 2 cm. long; bracts lanceolate, 4-6 mm. long; ovary 2-3 cm. long; sepals and petals linear, acuminate, light green, 5-7 cm. long; lip white, long-clawed, the claw about 2 cm. long, the flat, broadly ovate, acute or acuminate limb entire or slightly undulate, 3-4 cm. long; column 4-6 mm. long.

Porto Rico, collected by Otto Kuntze in 1874:—Jamaica; Curacao; continental tropical America.

2. ***Epidendrum cucullatum*** L. Sp. Pl. ed. 2, 1350. 1763.

Brassavola cucullata R. Br. in Act. Hort. Kew ed. 2, 5: 216. 1813.

Roots fibrous; stems clustered, slender, 8-12 cm. long. Leaf subcylindric, linear, channeled, 8-25 cm. long; peduncle slender, 1-flowered, 2.5 cm. long or less, with a few scarios scales at the base; ovary prolonged into a slender beak 7-12 cm. long; sepals and petals linear-lanceolate, acuminate, yellowish, 5-8 cm. long; lip short-clawed, about 2 cm. broad, fimbriate, narrowed above into an entire slender tip 2-3 cm. long; column about 10 mm. long.

On rocks and trees, St. Thomas:—St. Martin; Saba; St. Eustatius; Guadeloupe to Trinidad; Mexico; northern South America.

Epidendrum carinatum Vahl, of St. Croix, has not been identified by modern botanists; it is evidently not the same as *E. carinatum* of Linnaeus.

The orchid recorded from St. Thomas by Krebs as *Epidendrum bicornutum* Swartz, has not been identified; Swartz did not publish any species under that name. There is a published *Epidendrum bicornutum* Hooker (*Diacrium bicornutum* Benth.) of Tobago, Trinidad and northern South America.

33. **ELLEANTHUS** Presl, Rel. Haenk. 1: 97. 1827.

Epiphytic orchids, the leaves various, plicate, the flowers in terminal spikes or heads, distichous in the following species. Sepals distinct. Petals about as long as the sepals but narrower. Lip as long as the sepals or longer, concave at the base. Column without a foot. Anther operculate, 2-celled; pollinia 8, ovoid, waxy. Capsule oblong. [Greek, clustered flowers.] About 50 species or more, natives of tropical America. Type species: *Elleanthus lancifolius* Presl.

1. ***Elleanthus linifolius*** Presl, Rel. Haenk. 1: 197. 1827.

Stems simple, usually clustered, slender, smooth, 2-3.5 dm. long. Leaves narrowly linear, thin, 1-nerved, 12 cm. long or less, 1.5-3 mm. wide, sessile, the sheaths about 2 cm. long; spike densely several-flowered, 1-2 cm. long, the white flowers distichous; bracts ovate-oblong, obtuse, 6-10 mm. long; sepals about 3 mm. long, the middle one narrower than the oblique lateral ones; petals narrowly spatulate, the apex rounded; lip obovate, ciliate-denticulate, about 3 mm. broad; column about 2 mm. long.

On trees in forests, Porto Rico, mostly at higher elevations in the central and western mountains:—Jamaica; Cuba; Hispaniola; South America.

34. **STELIS** Sw. in Schrad. Journ. 2: 239. 1799.

Small epiphytic orchids, with clustered or creeping, 1-leaved stems, and small or minute flowers in racemes, the leaf petioled; pseudobulbs none. Sepals nearly equal, spreading, broad, more or less connate. Petals much shorter than the sepals. Lip sessile, similar to the petals. Column as long as the lip or shorter, without a foot. Anther 2-celled, operculate; pollinia 2, waxy. Capsule ovoid or oblong. [Ancient Greek name for some plant parasite.] Over 150 species, natives of tropical America. Type species: *Epidendrum ophioglossoides* Jacq.

1. **Stelis perpusilliflora** Cogn. in Urban, Symb. Ant. 6: 386. 1909.

Stems clustered, erect, jointed below the middle, 6–12 cm. long, with an appressed sheath 3–5 cm. long. Leaf oblong, obtuse, erect, firm in texture, flat, 6–11 cm. long; racemes 1–4, densely several-many-flowered, much shorter than the leaf; pedicels about 1 mm. long; bracts scarious, 1.5–2 mm. long; sepals about 1.5 mm. long; petals about half as long as the sepals; lip concave, as long as the petals.

On trees in the forests of the eastern mountains of Porto Rico:—Guadeloupe; Dominica.

35. **PLEUROTHALLIS** R. Br. in Ait. Hort. Kew ed. 2, 5: 213. 1813.

Epiphytic orchids, large, small or minute, with tufted or creeping 1-leaved stems, sheathed below, and small flowers in racemes borne at the base of the leaf and subtended by a spathe. Sepals nearly equal, the dorsal one free, the lateral ones usually connate. Petals narrow, free, mostly shorter than the sepals. Lip mostly shorter than the petals, 3-lobed. Anther operculate, 1–2-celled; pollinia 2, waxy. Capsule oblong to globose. [Greek, side frond; the inflorescence is borne by the side of the leaf.] Many species, perhaps 500, natives of tropical America. Type species: *Epidendrum ruscifolius* Jacq.

Raceme subtended by a large spathe.

Lip entire.

Lip 3-lobed.

Spathe inconspicuous, scarious.

Sepals membranous.

Secondary stems elongated.

Flowers racemose.

Flowers fascicled.

Flowers solitary, rarely 2.

Stems very short; plants caespitose.

Sepals fleshy.

1. *P. gelida*.

2. *P. crassipes*.

3. *P. pruinosa*.

4. *P. ruscifolia*.

5. *P. Wilsoni*.

6. *P. Urbaniana*.

7. *P. coriacea*.

1. **Pleurothallis gelida** Lindl. Bot. Reg. 27: Misc. 186. 1841.

Pleurothallis univaginata Lindl. Ann. & Mag. Nat. Hist. III. 1: 326. 1858.

Stems several together, stout, subterete, 1–2.5 dm. long, jointed at or below the middle. Leaf oblong, coriaceous, 1–2 dm. long, 3–8 cm. wide, obtuse at the apex, narrowed at the base into a petiole 1–3 cm. long; spathe coriaceous, 1–4 cm. long; racemes 2 or 3, slender, as long as the leaves or shorter, many-flowered; bracts obtuse, 2–3 mm. long; flowers yellowish; pedicels very short; sepals linear, about 7 mm. long; petals ligulate, subtruncate, about 3 mm. long; lip oblong, obtuse, entire, a little shorter than the petals; capsule oblong, about 8 mm. long.

On trees in forests at middle and higher elevations in the central and western mountains of Porto Rico:—Florida; Jamaica; Cuba; Hispaniola.

2. **Pleurothallis crassipes** Lindl. Fol. Orch. Pleurothallis 29. 1859.

Stems tufted, rather stout, jointed at or below the middle, 8–25 cm. long. Leaf oblong or oblong-obovate, coriaceous, 6–15 cm. long, 2–4 cm. wide, the apex obtuse, the base cuneate, the petiole 1.5–3 cm. long; spathe coriaceous, 7–12 mm. long; racemes 1–3, shorter than the leaves, many-flowered; bracts 2–3 mm. long; pedicels very short; flowers yellow; sepals ovate, acute, about 3 mm. long, the lateral ones connate to the middle; petals oblong, obtuse, 2 mm. long; lip obovate, 3-lobed, 1.5 mm. long, the lobes rounded; capsule oblong, about 8 mm. long.

On trees and rocks in forests, Porto Rico, mostly at higher elevations:—Hispaniola; northern South America.

3. **Pleurothallis pruinosa** Lindl. Bot. Reg. 28; Misc. 75. 1842.

Stems tufted, slender or nearly filiform, 1–2-jointed, 7 cm. long or less. Leaf oblong or oblong-lanceolate, 2–4 cm. long, sessile, the apex 2-denticulate, the base narrowed; racemes 1 or 2, very slender, about as long as the leaf, 2–4-flowered; spathe inconspicuous; bracts obtuse, about 2 mm. long; pedicels 2–4 mm. long; flowers yellowish-green; sepals ovate, acute, pruinose, 2–3 mm. long; petals linear, acute, nearly as long as the sepals; lip ovate, entire, about 1.5 mm. long; capsule oblong, about 6 mm. long.

On trees at higher elevations in the Luquillo Mountains and near Maricao, Porto Rico:—Jamaica; Hispaniola; Guadeloupe; Martinique; Grenada; Trinidad; Guiana.

4. **Pleurothallis ruscifolia** (Jacq.) R. Br. in Ait. Hort. Kew ed. 2, 5: 211. 1813.

Epidendrum ruscifolium Jacq. Enum. 29. 1760.

Stems clustered, slender, terete, jointed near the middle, 1–3 dm. long. Leaf rather thin, oblong or oblong-lanceolate, 6–15 cm. long, 1.5–3.5 cm. wide, the apex acuminate and 3-denticulate, the base narrowed into a petiole 1–2 cm. long; spathe ovate, short; flowers yellow or yellowish-green, fasciated at the base of the leaf; pedicels filiform, 5–10 mm. long; sepals linear-lanceolate, acuminate, about 7 mm. long; petals narrowly linear, about half as long as the sepals; lip ovate-oblong, entire, only 1–1.5 mm. long; capsule linear-oblong, 10–12 mm. long.

On trees, rarely on rocks, in forests, mostly at higher elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

5. **Pleurothallis Wilsoni** Lindl. Ann. & Mag. Nat. Hist. III. 1: 326. 1858.

Stems nearly filiform, scattered along a very slender, creeping rootstock, 1-jointed, 2–5 cm. long. Leaf rather thin, narrowly oblong to oblong-lanceolate, sessile, acute or acuminate at the apex and 3-denticulate, narrowed at the base; peduncle filiform, 1-flowered, 6–15 mm. long; flower greenish-yellow; sepals about 4 mm. long, the dorsal one obtuse, the lateral ones triangular-ovate, acute, connate; petals narrowly ovate, about 1.5 mm. long; lip ovate, obtuse and 2.5 mm. long; capsule oblong-obovoid, about 8 mm. long.

On trees in forests, at middle and higher elevations in the central and western districts of Porto Rico:—Jamaica; Hispaniola; Guadeloupe.

6. **Pleurothallis Urbaniana** Rchb. f. Ber. Deutsch. Bot. Gesell. 3: 279. 1885.

Diminutive; stems tufted, filiform, only 3 mm. long or less. Leaf oblong, 1–2 cm. long, 3–5 mm. wide, obtuse and minutely 3-denticulate at the apex, narrowed at the base into a slender petiole; peduncle capillary, much longer than the leaf, loosely several-flowered; pedicels 3–8 mm. long; bracts 1–2 mm. long, acuminate; flowers distichous, white with red veins; sepals caudate-acuminate,



ciliate, about 7 mm. long; petals lanceolate, acuminate, fimbriate, about half as long as the sepals; lip triangular, about 3 mm. long, 3-lobed, the middle lobe ligulate, muriculate.

On trees or primaeval forests in the central and western mountains of Porto Rico. Endemic.

7. **Pleurothallis coriacea** Bello, Anal. Soc. Esp. Hist. Nat. **12**: 116. 1883.

Stems scattered or clustered on a rather stout rootstock, slender, terete, 2-jointed, 5-14 cm. long. Leaf oblong, thick, 4-8 cm. long, 1-2.5 cm. wide, sessile, obtuse and denticulate at the apex, obtuse at the base; spathe small; raceme several-flowered, mostly shorter than the leaf; bracts scarious, acute, 2-3 mm. long; pedicels very short; flowers violet, distichous or secund; sepals fleshy, triangular, acute, about 4 mm. long, the lateral ones connate to about the middle; petals lanceolate, subspatulate, 3 mm. long; lips 3-lobed, about as long as the petals; capsule oblong, hirtellous, about 1 cm. long.

On trees in woods and forests of the central mountains of Porto Rico. Endemic.

A barren specimen of an orchid collected by Prof. F. L. Stevens, Nov. 11, 1913, on Monte Alegrillo near Maricao (4493), represents another species of *Pleurothallis*: Mr. Oakes Ames suggests relationship with *P. prostrata* Lindl.

36. **LEPANTHES** Sw. Nov. Act. Acad. Upsal. **6**: 85. 1799.

Small epiphytic orchids, with slender, several-sheathed and 1-leaved stems, the leaf broad, flat, sessile or nearly so the minute flowers in one or more racemes at its base; pseudobulbs none. Sepals broad, nearly equal, the lateral ones more or less connate. Petals transversely oblong, much shorter than the sepals, the short claw adnate to the base of the column. Lip 2-lobed, the lobes various. Anther operculate; pollinia 2, waxy. Capsule ovoid, obovoid or subglobose. [Greek, bark-flower.] Perhaps 50 species, natives of tropical America. Type species: *Lepanthes concinna* Sw.

1. **Lepanthe; se enipetala** Rchb. f. Ber. Deutsch. Bot. Gesell. **3**: 279. 1885.

Stems tufted, very slender, jointed at the nodes, 3-12 cm. long, the sheaths about 1 cm. long, appressed, striate, muriculate, their mouths obliquely dilated, acute, ciliolate. Leaf thin, ovate or ovate-oblong, 2-3.5 cm. long, the apex acute and 3-denticulate, the base rounded, the petiole only 1 or 2 mm. long; peduncles several, capillary, 8-20 mm. long, several-flowered; pedicels about 1.5 mm. long; bracts acute, shorter than the pedicels; sepals ovate, about 3.5 mm. long, yellow; petals half-lunate, 2 mm. broad, saffron, the lobes divaricate; lip acute, 1.5 mm. long; capsule subglobose, about 4 mm. thick.

On trees in mountain forests at middle and higher elevations of Porto Rico. Endemic.

37. **BLETIA** R. & P. Syst. 229. 1798.

Terrestrial orchids, with globose or ovoid corms, narrow, elongated linear or lanceolate leaves, the slender sheathed scape arising from the side of the corm, the large purple or pink flowers in simple or branched racemes. Sepals nearly alike, ovate or oblong. Petals similar to the sepals. Lip broad, 5-7-crested, 3-lobed. Column elongated. Anther 2-celled; pollinia obovate, waxy. Capsules oblong, erect. [Commemorates L. Blet, a Spanish apothecary.] About 45 species mostly of tropical America. Type species: *Bletia catenulata* R. & P.

1. **Bletia patula** Hook. Bot. Mag. *pl.* 3518. 1836.

Corm (pseudobulb) globose, transversely annulate, 5 cm. in diameter or less, covered with membranous sheaths. Leaves linear-oblong or linear-lanceolate, 3–6 dm. long, 2–5 cm. wide, long-acuminate, the base narrowed into a channeled petiole; scape slender, mostly longer than the leaves, simple or little-branched, bearing a few pointed sheaths, few-several-flowered; bracts acute or acuminate, 5 mm. long or less; flowers spreading, slender-pedicelled, purple; sepals lanceolate, acute, narrowed below, 3–3.5 cm. long; petals narrowly spatulate, about 1 cm. wide, obtuse; column without a foot; lip deeply 3-lobed, about as long as the petals.

On cliffs, banks and rocks at lower and middle altitudes, Porto Rico, in moist or wet districts:—Cuba; Hispaniola.

Bletia purpurea (Lam.) DC., of the Bahamas, Florida, Jamaica, Cuba and Hispaniola was recorded by Krebs as found in St. Thomas prior to 1851; it resembles *B. patula*, but the column of the flower is produced into a foot. [*Limodorum purpureum* Lam.; *Bletia verecunda* R. Br.]

38. **CYRTOPODIUM** R. Br. in Ait. Hort. Kew ed. 2, 5: 216. 1813.

Epiphytic orchids (or some species terrestrial), with large fusiform pseudobulbs, long plicate leaves, and large flowers in racemes or panicles on lateral scapes. Sepals distinct, nearly equal. Petals similar to the median sepal. Lip 3-lobed, adnate to the foot of the column. Anther terminal, operculate, imperfectly 2-celled; pollinia 2 or 4, ovoid or globose, waxy, not appendaged. Capsule oblong, reflexed. [Greek, arched foot.] Perhaps 20 species, natives of tropical regions. Type species: *Cymbidium Andersonii* Lambert.

1. **Cyrtopodium punctatum** (L.) Lindl. Gen. & Sp. Orch. 188. 1833.

Epidendrum punctatum L. Syst. Ed. 10, 1246. 1013.

Pseudobulbs very large, 6–10 dm. long, 3–5 cm. thick. Leaves linear-oblong or linear-lanceolate, 3–6 dm. long, 2–5 cm. wide, long-acuminate, narrowed to the base; scape up to 1.5 m. long, rather stout, branched above the middle, bearing large, membranous, acute bracts sometimes 1 dm. long, the bracts subtending flowers 2–5 cm. long; sepals oblong, acute, undulate, about 2 cm. long, yellowish with transverse brown bands; petals obovate, yellow, about as long as the sepals; lip red, variegated with yellow, long-clawed, cordate, broader than long, the terminal lobe reniform, emarginate; capsule about 1 cm. long.

On trees near Utuado and on calcareous rocks near Cayuco, Porto Rico:—Florida Cuba; Hispaniola; Trinidad; tropical continental America. Occasionally grown in Porto Rico gardens. COW-HORN. PINUELAS.

39. **PLATYPUS** Small & Nash; Small, Fl. SE. U. S. 329, 1329. 1903.

Terrestrial orchids with subglobose corms, long narrow flat leaves, and a lateral sheathed scape terminated by a raceme of rather large flowers. Sepals distinct, the median one somewhat narrower than the lateral ones, which are adnate to the base of the column. Petals a little shorter and broader than the sepals. Lip papillose-crested, slightly 3-lobed, concave at the base, the middle lobe drooping. Column with a flat, dilated foot. Capsule oblong. [Greek, flat foot.] A monotypic genus.

1. **Platypus altus** (L.) Small, Fl. SE. U. S. ed. 2, 329. 1913.

Limodorum altum L. Syst. ed. 12, 2: 594. 1767.

Dendrobium longifolium H.B.K. Nov. Gen. 1: 360. 1815.

Cyrtopodium Woodfordii Sims, Bot. Mag. pl. 1814. 1816.

Cyrtopera longifolia Rehb. f. in Walp. Ann. 6: 668. 1863.

Eulophia alta Fawcett & Rendle, Fl. Jam. 1: 112. 1910.

Platypus papilliferus Small & Nash; Small, Fl. SE. U. S. 329, 1339. 1903.

Corms 4–7 cm. in diameter, bearing several leaves 2–10 dm. long, 2–7 cm. wide, appearing before the scape and withering after it develops. Scape stout, glabrous, 1.5 m. long or less; raceme several-many-flowered; bracts linear-subulate, 7–25 mm. long; flowers brownish purple; sepals 1.5–2 cm. long; oblong, acute; petals oblong, 1.4–1.7 cm. long; lip 14–18 mm. long.

Hillsides and forests at high elevations, Porto Rico; Tortola.—Florida; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; northern South America; West Africa.

40. **GOVENIA** Lindl. in Lodd. Bot. Cab. pl. 1709. 1831.

Terrestrial orchids with rootstocks, the leaves few, plaited, the stem erect, the rather small flowers in a simple terminal spike-like raceme. Sepals connivent, nearly equal, the median one erect, incurved. Petals similar to the sepals. Lip concave, simple. Column winged, incurved, its foot short. Anther incumbent, convex, 1-celled; pollinia 4, waxy, not appendaged. Capsule oblong. [Commemorates James Robert Gowen, an English botanist, who died in 1862.] About 17 species, natives of tropical America. Type species: *Govenia superba* Lindl.

1. **Govenia utriculata** (Sw.) Lindl. Bot. Reg. 25: Misc. 47. 1839.

Cymbidium utriculatum Sw. Nov. Act. Ups. 6: 75. 1799.

Plant 3–7 dm. high, the stem rather stout, bearing large basal inflated bladeless sheaths and 1 or 2 broad leaves. Basal sheaths usually 2, membranous, 4–20 cm. long; leaves usually 2, elliptic, 1–2.7 dm. long, 5–9 cm. wide, acute or acuminate at the apex, narrowed at the base, finely many-nerved; cauline sheaths 1 or 2, obtuse, about 5 cm. long; raceme few-several-flowered, 1.5 dm. long or less; pedicels 3–5 mm. long; bracts narrowly lanceolate, 1–2 cm. long; flowers whitish; sepals about 1.5 cm. long, the lateral lanceolate, the median oblong; petals about as long as the sepals; lip ovate, acute, about 9 mm. long; capsules deflexed, 2.5–3 cm. long.

Woods and forests, Porto Rico, at lower and middle altitudes in moist districts:—Bahamas; Jamaica; Cuba; Hispaniola.

41. **XYLOBIUM** Lindl. Bot. Reg. under pl. 897. 1825.

Epiphytic orchids, with pseudobulbs, the leaves elongated, venose-plicate, the rather large flowers racemose on a scape borne at the base of the pseudobulb, Sepals about equal, the lateral ones adnate to the base of the column. Petals similar to the median sepal. Lip articulated with the foot of the column, its lateral lobes erect, the middle lobe short, broad and spreading. Anther 1-celled; pollinia 4, ovoid, unappendaged. Capsule oblong. [Greek, growing on wood.] About 20 species, of tropical America. Type species: *Dendrobium squalens* Lindl.

1. **Xylobium palmifolium** (Sw.) Benth.; Fawcett, Flow. Pl. Jam. 39. 1893.

Epidendrum palmifolium Sw. Prodr. 123. 1788.

Pseudobulbs narrowly ovoid, clustered, 5–7 cm. long. Leaf oblong-lanceolate, 3–4 dm. long, 8 cm. wide or less, the apex acuminate, the base narrowed into

a petiole; scape few—several-flowered, much shorter than the leaves, the bracts linear, 2–3 cm. long; flowers odorous, yellowish-white; sepals about 2 cm. long; petals ovate-lanceolate, shorter than the sepals; lip obovate, about as long as the petals.

Maricao, (*Stevens and Hess, 4874*, barren):—Jamaica. When flowers of the Porto Rico plant are obtained it may be referable to some other species.

52. **KOELLENSTEINIA** Rchb. f. *Bonplandia* 2: 17. 1854.

Epiphytic orchids, the internodes of the stems tuberous-thickened, the few and narrow leaves plicate-venose, the flowers in a terminal raceme. Sepals distinct. Petals similar to the sepals but a little smaller. Lip short-clawed, narrow, adnate to the base of the column, 3-lobed. Column short. Anther 1-celled; pollinia 2, waxy, oblong, not appendaged. [Commemorates Kellner von Koellenstein, a plant collector.] A few species, natives of tropical America. Type species: *Koellensteinia Kellneriana* Rchb. f.

1. **Koellensteinia graminea** (Lindl.) Rchb. f. *Bonplandia* 4: 323. 1856.

Maxillaria graminea Lindl. Bot. Reg. 21: under *pl. 1802*. 1835.

Leaves 2 or 3, linear, acuminate, 8–20 cm. long, 2–7 mm. wide. Scape 2–4-flowered, slender, usually about as long as the leaves; pedicels short; flowers yellowish, sepals ovate-oblong, acute 6–7 mm. long; petals oblong, obtuse, a little shorter than the sepals; lip broadly deltoid, 5–6 mm. broad, cordate, its lobes obtuse or rounded.

On trees, near Utuado:—Guiana, Brazil.

43. **BOLBOPHYLLARIA** G. Reichb. Bot. Zeit. 10: 934. 1852.

Epiphytic or saxicolous orchids, with creeping rootstocks and 1-leaved or 2-leaved pseudobulbs, the leaves duplicate in bud, the small flowers spicate or racemose on lateral sheathed scapes. Lower sepal distinct, the lateral ones oblique, adnate to the base of the column. Petals shorter than the sepals. Lip entire or 3-lobed, jointed with the foot of the column. Column short, produced into a foot. Anther 2-celled; pollinia 4, waxy, not appendaged. Capsule oblong, beakless. [Greek, like *Bolbophyllum*.] A few species, of tropical America. Type species: *Bolbophyllum bracteolatum* Lindl.

1. **Bolbophyllaria pachyrrhachis** (A. Rich.) Rchb. f. in Walp. Ann. 6: 241. 1861.

Pleurothallis ? pachyrrhachis A. Rich. in Sagra, Hist. Cub. 11: 234. 1850.
Bolbophyllum pachyrrhachis Griseb. Fl. Br. W. I. 613. 1864.

Stem creeping and freely rooting, slender, bearing several pseudobulbs 2–3 cm. apart. Pseudobulbs narrowly ovoid, flattened, 2–4 cm. long, bearing 2, linear to oblanceolate, acute leaves 7–16 cm. long, 10–16 mm. wide, narrowed to the base; scape slender, simple, spreading or drooping, 2–4 dm. long, bearing several sheaths below and a many-flowered spike of yellowish purple flowers above; bracts ovate, acuminate, 2–4 mm. long; sepals long-acuminate, about 5 mm. long; petals oblong, 2 mm. long; lip oblong, short-clawed, about 3 mm. long.

On cliffs near Utuado:—Jamaica; Cuba; Trinidad.

44. **ORNITHIDIUM** Salisb. Trans. Hort. Soc. 1: 293. 1812.

Epiphytic orchids, the stems short or elongated, bearing few or many 1–2-leaved pseudobulbs, the rather large flowers solitary on short or long peduncles, which are solitary, fascicled or glomerate in the axils. Sepals acute, nearly distinct. Petals similar to the sepals, but somewhat shorter. Lip 3-lobed, the lateral lobes erect, the middle one spreading. Column short. Anther imperfectly 2-celled; pollinia 4, ovoid, waxy. Capsule mostly oblong. [Greek, a little bird.] About 20 species, of tropical America and Mexico. Type species: *Ornithidium coccineum* (Jacq.) Salisb.

Peduncles fascicled, 4–7 cm. long.
Flowers subsessile, glomerate.

1. *O. coccineum*.
2. *O. confertum*.

1. **Ornithidium coccineum** (Jacq.) Salisb. Trans. Hort. Soc. 1: 293. 1812.

Epidendrum coccineum Jacq. Enum. 29. 1760.

Ornithidium vestitum Rehb. f. Ber. Deutsch. Bot. Gesell. 3: 276. 1886.
Not Rehb. f. 1863.

Stems usually short, stout, covered with old persistent sheaths. Pseudobulbs ovoid, flattened, 1-leaved, 2–4 cm. long; leaf linear, acute or acutish, 1–3.5 dm. long, 1–2.5 cm. wide, attenuate to the base; peduncles very slender, fascicled, 4–7 cm. long; bracts obtuse, 8–12 mm. long; flowers bright red, nodding; sepals ovate, acuminate, about 1 cm. long; petals ovate, acuminate, about 8 mm. long; lip short-clawed, somewhat 3-lobed, 6–7 mm. long, the lobes entire, the lateral ones rounded, the middle one acute.

On trees in forests at higher elevations in moist districts, Porto Rico:—Jamaica?; Hispaniola; St. Kitts to Trinidad; northern South America.

2. **Ornithidium confertum** Griseb. Fl. Br. W. I. 626. 1864.

Stems creeping, up to 4 cm. long, covered toward the base with imbricated scales, the pseudobulbs 1–3 cm. apart, narrowly oblong, 1-leaved, flattened, 1.5–2.5 cm. long. Leaf linear to linear-lanceolate, thin, obtusish, 6–13 cm. long, 6–10 mm. wide; peduncles only 2 or 3 mm. long, glomerate; flowers white with purple veins; bracts acute, 3–5 mm. long; sepals ovate-lanceolate, about 3 mm. long; petals lanceolate, nearly as long as the sepals; lip long-clawed, deltoid, obtuse, about as long as the petals.

On trees near Utuado and Cayuco, Porto Rico:—Cuba; Grenada; Tobago, Trinidad.

45. **IONOPSIS** H.B.K. Nov. Gen. 1: 348. 1815.

Epiphytic or saxicolous orchids, with flat or terete leaves, slender lateral scapes, and small slender-pedicelled flowers in racemes or panicles; pseudobulbs none. Sepals about equal, the middle one free, the lateral ones connate, saccate. Petals similar to the middle sepal. Lip 3-lobed, adnate to the base of the short column, clawed, the middle lobe the largest. Anther 1-celled; pollinia 2, waxy, unappendaged. Capsule oval or oblong. [Greek, like a little violet.] A few species, of tropical America and Mexico. Type species: *Ionopsis pulchella* H.B.K.

Leaves linear or linear-oblong, flat.
Leaves terete, subulate.

1. *I. utricularioides*.
2. *I. satyroides*.

1. **Ionopsis utricularioides** (Sw.) Lindl. Coll. pl. 39A. 1825.

Epidendrum utricularioides Sw. Prodr. 122. 1788.

Ionopsis utricularioides latifolia Cogn. in Urban, Symb. Ant. 4: 180. 1903.

Stem rather short; leaves linear or linear-oblong, flat, subcoriaceous, carinate, acuminate, narrowed to the base, 5–15 cm. long, 5–30 mm. wide; scape slender,

rather stiff, 2-4 dm. long; flowers several or numerous, racemose or paniced, white, pink or lavender striped with purple; bracts about 2 mm. long; pedicels nearly filiform, 5-10 mm. long; sepals oblong, acute, about 6 mm. long, the sac blunt; petals oblong, abruptly acute; lip 10-13 mm. long and about as wide as long, its lobes rounded.

On shrubs, trees and banks in moist districts, Porto Rico, ascending into the higher central mountains; St. Thomas (ex Cogniaux);—Florida; Jamaica; Cuba; Hispaniola Martinique; St. Vincent; Trinidad; tropical continental America.

2. **Ionopsis satyroides** (Sw.) Rchb. f. in Walp. Ann. 6: 633. 1861.

Epidendrum satyroides Sw. Prodr. 123. 1788.

Ionopsis teres Lindl. Bot. Reg. 24: Misc. 95. 1838.

Leaves rather fleshy, terete, 5-11 cm. long, 2-3 mm. thick, sulcate above. Scape slender, 5-25 cm. long, few-several-flowered; bracts 2-3 mm. long, acuminate; pedicels 4-6 mm. long; flowers white or yellowish; sepals about 7 mm. long, acute; the sac short, rounded; petals narrowly oblong, acute; lip about 9 mm. long and 4 mm. wide, cuneate below, undulate, somewhat 3-lobed; capsule oval, about 12 mm. long.

On low trees at middle elevations in moist districts, Porto Rico;—Jamaica; Cuba; Hispaniola; northern South America.

46. **COMPARETTIA** Poepp. & Endl. Nov. Gen. 1: 42. 1836.

Epiphytic orchids, with small fleshy, 1-leaved pseudobulbs, the leaves flat, the simple or little-branched, slender scape arising from the base of the pseudobulb, the flowers rather large, racemose. Sepals nearly equal, the middle one distinct, the lateral ones connate and produced into a long spur. Petals similar to the middle sepal. Lip 3-lobed, continuous with the base of the column, its base with 2 long spurs. Anther 1-celled; pollinia 2, waxy, unappendaged. [Commemorates A. Comparetti, 1746-1801, Professor in Padua.] Two or three species, of tropical America. Type species: *Comparettia saccata* Poepp. & Endl.

1. **Comparettia falcata** Poepp. & Endl. Nov. Gen. 1: 42. 1836.

Pseudobulbs oblong, somewhat flattened, about 2 cm. long or less. Leaf oblong, 5-12 cm. long, 2-4 cm. wide, obtuse or acutish; scape slender, drooping, few-several-flowered, 1.5-4 dm. long; pedicels slender, short; flowers rose to purple; dorsal sepal about 6 mm. long, acute, the spur about twice as long; petals obovate, about 9 mm. long; lip sessile, obcordate, about 12 mm. long and nearly as broad as long; capsule oblong, beaked, 2-3 cm. long.

On trees in mountain forests near Adjuntas;—Jamaica; Cuba; continental tropical America.

47. **ONCIDIUM** Sw. Vet. Akad. Handl. 21: 239. 1800.

Mostly epiphytic orchids, with or without pseudobulbs, the leaves flat or 3-edged, elongated or short, the stems short, the peduncles or scapes lateral, the flowers in loose racemes or panicles. Sepals nearly equal, spreading or reflexed, the lateral ones connate in some species. Petals similar to the median sepal. Lip clawed or sessile, 3-lobed, crested or tubercled, the middle lobe broad, notched or 2-cleft. Column short, winged, without a foot. Anther inclined, convex or semiglobose, 1-celled or imperfectly 2-celled; pollinia 2, waxy, not appendaged.

Capsule ovoid to fusiform, beaked. [Greek, referring to the tubercled lip.] More than 400 species, natives of tropical and subtropical America. Type species: *Oncidium carthaginense* (Jacq.) Sw.

Leaves flat; pseudobulbs present.

Lip triangular-cordate, entire; scapes flattened.

Lip auricled; scape terete.

Leaves equitant, distichous; no pseudobulbs.

Flowers yellow.

Flowers white or rose.

Leaf-margins serrulate or entire; isthmus of lip short.

Leaf-margins serrulate; isthmus of lip elongated, toothed.

1. *O. alatum*.

2. *O. altissimum*.

3. *O. intermedium*.

4. *O. variegatum*.

5. *O. Leiboldi*.

1. ***Oncidium alatum*** Cogn. in Urban, Symb. Ant. **6**: 642. 1910.

Pseudobulbs ovoid, flattened, 1-leaved, 1–2 cm. long, often subtended by several leaves. Leaves thin, oblong, 4–8 cm. long, acute at the apex, narrowed to the base; scape slender, 2.5 dm. long or less, flattened and narrowly 2-winged, branched or simple, racemously few–several-flowered; bracts ovate, acute, cordate-clasping, 3–4 mm. long; pedicels 4–8 mm. long; sepals oblanceolate, acute, yellow with a brown base, 8–10 mm. long; petals a little shorter than the sepals, yellow, oblong-spatulate, obtusish; lip yellow, sessile, triangular-cordate, entire, crested, as long as the middle sepal; capsule oblong, about 2 cm. long, 6-winged, beaked.

On trees in mountain forests, Porto Rico:—Guadeloupe.

2. ***Oncidium altissimum*** (Jacq.) Sw. Vet. Akad. Handl. **21**: 240. 1800.

Epidendrum altissimum Jacq. Enum. 30. 1760.

Oncidium Baueri Lindl. in Bauer, Ill. Orch. pl. 7. 1830.

Oncidium Wydleri Rehb. f. Ber. Deutsch. Bot. Ges. **3**: 276. 1885.

Pseudobulbs oblong, much flattened, 2-edged, 7–15 cm. long, 1–2-leaved. Leaves linear-ligulate, elongated, acute, 2.5–6 dm. long, 2–7 cm. wide; scape much longer than the leaves, 3.5 m. long or less, terete, branched above, the branches few–several-flowered; bracts triangular-ovate to triangular-lanceolate, acute, 5–20 mm. long; pedicels 1–1.5 cm. long; flowers yellow or yellow-brown, variously mottled with brown; sepals oblong or oblong-lanceolate, acute, 10–18 mm. long, undulate, petals narrowly oblong, as long as or a little shorter than the sepals; lip quadrangular-obovate, about 1.5 cm. long, the terminal lobe much larger than the lateral ones.

On trees and rocks at lower and middle elevations in moist districts, Porto Rico; Guadeloupe to Grenada; continental tropical America. Races differ in color, mottling and size of the flowers. Occasionally grown in Porto Rico gardens.

3. ***Oncidium intermedium*** Bert.: Spreng. Syst. **3**: 728. 1826.

Oncidium Lemonianum Lindl. Bot. Reg. **21**: pl. 1789. 1835.

Pseudobulbs none; leaves equitant, distichous, conduplicate, linear-lanceolate, subcoriaceous, 5–10 cm. long, the margin denticulate. Scape slender, simple, or branched above, loosely few–several-flowered, 7 dm. long or less; bracts triangular, 3–5 mm. long; pedicels 6–10 mm. long; flowers golden yellow; sepals about 5 mm. long, the lateral ones connate; petals obovate, 7–8 mm. long; lip deeply 3-lobed, about 12 mm. long, the lateral lobes small, oblong, obtuse, the terminal one large, reniform, cordate, emarginate, 10–13 mm. wide.

Picaro Peninsula and Fortuna, St. Thomas (according to Eggers):—Cuba; Hispaniola; Antigua; Guadeloupe; Martinique.

4. ***Oncidium variegatum*** Sw. Nov. Act. Holm. **21**: 240. 1800.

Epidendrum variegatum Sw. Prodr. 122. 1788.

Oncidium velutinum Lindl. in Paxton, Flower Garden **1**: 166. 1851.

Oncidium sylvestre Lindl. Ann. & Mag. Nat. Hist. III. **1**: 332. 1858.

Pseudobulbs none; leaves usually several, equitant, distichous, lanceolate, 4–10 cm. long, the margin denticulate. Scape slender, simple or with few

branches, 1–4 dm. long, several—many-flowered; bracts acuminate, 2–4 mm. long; pedicels nearly filiform, about 1 cm. long; flowers glabrous or velvety, white, pink or variegated; sepals obtuse, about 6 mm. long; petals obovate, a little longer than the sepals; lip deeply 3-lobed, its isthmus short, scarcely toothed, the terminal lobe reniform, 10–15 mm. broad, much larger than the oblong lateral ones. [*O. pulchellum* of Bello, not of Hooker.]

On small trees, at lower and middle elevations, Porto Rico; St. Thomas; Tortola; Virgin Gorda:—Florida; Cuba; Hispaniola; Saba.

5. **Oncidium Leiboldii** Rehb. f. in Walp. Ann. 6: 718. 1863.

Pseudobulbs none; leaves few, equitant, short, curved, 1.5–4 cm. long, conduplicate, the margins denticulate. Scape slender, simple or rarely a little branched, 2.5 dm. long or less, few-flowered; flowers white or pinkish, velvety or glabrous; bracts ovate, 2–3 mm. long; sepals oblong, obtuse, 4–5 mm. long, the lateral ones connate; petals cuneate-obovate, undulate, 6–7 mm. long; lip 11–14 mm. long, sessile, subcordate, deeply 3-lobed, the lateral lobes small, obtuse, the terminal one reniform, 12–15 mm. broad, emarginate, the isthmus elongated, toothed.

On shrubs and trees at lower and middle elevations, Porto Rico; Vieques; Culebra; St. Thomas:—Cuba; Hispaniola. Erroneously recorded from the Bahamas. Not very different from the preceding species.

Oncidium Papilio Lindl., BUTTERFLY ORCHID, of Trinidad and South America, occasionally grown in Porto Rico and Virgin Island gardens has suborbicular pseudobulbs about 5 cm. broad, lanceolate flat leaves 1.5–2 dm. long, the long scape bearing one or several yellowish brown flowers with linear sepals up to 12 cm. long, the lip 3.5–5 cm. long.

Oncidium Cebolleta (Jacq.) Sw., of the southern West Indies and continental tropical America, occasionally grown in Porto Rico and Virgin Island gardens, has oblong flattened pseudobulbs about 1 cm. long, nearly cylindrical leaves 4 dm. long or less and about 1 cm. thick; its numerous yellow and purple-mottled flowers are about 2 cm. broad, borne on a long scape. [*Epidendrum Cebolleta* Jacq.]

48. **LEOCHILUS** Knowles & Westc. Fl. Cab. 2: 143. 1838.

Small epiphytic orchids, with short stems and 1-leaved pseudobulbs, the leaves flat, the slender scapes racemosely few-flowered, usually simple. Sepals nearly equal. Petals similar to the sepals. Lip attached to the base of the column, 3-lobed or nearly entire. Column short, without a foot. Anther 1-celled, with a long membranous appendage; pollinia 2, waxy, unappendaged. Capsule oblong, beaked. [Greek, smooth lip.] A few species, of tropical America. Type species: *Leochilus onchioides* Knowles & Westcott.

1. **Leochilus labiatus** (Sw.) Kuntze, Rev. Gen. Pl. 656. 1891.

Epidendrum labiatum Sw. Prodr. 124. 1788.

Liparis labiata Spreng. Syst. 3: 741. 1826.

Pseudobulbs ovoid, flattened, 7–10 mm. long, subtended by 1–4 leaves. Leaves oblong, coriaceous, 2–5 cm. long, 5–13 mm. wide, acute, carinate; scape 10 cm. long or less, 2–6-flowered; flowers yellow; bracts acute, 2–4 mm. long; pedicels short; sepals oblong, about 5 mm. long, the lateral ones connate to about the middle; petals narrowly oblong, about as long as the sepals; lip obovate, 7–8 mm. long, narrowed below, the apex rounded or retuse.

On trees, near Utuado and Mayaguez, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; St. Vincent; Tobago; Trinidad. Recorded by Krebs as formerly found in St. Thomas.

49. **WARSEWICZELLA** Rehb. f. Bot. Zeit. 10: 635. 1852.

Epiphytic orchids, without pseudobulbs, the leaves flat, distichous; flower large, solitary, on a short slender scape. Sepals nearly alike, distinct, the lateral ones attached to the short foot of the incurved column. Petals similar to the sepals. Lip jointed with the foot of the column, broad, somewhat 3-lobed. Anther imperfectly 2-celled; pollinia 4, compressed, unappendaged. Capsule fusiform, beakless. [Diminutive of *Warszewiczia*.] A few species, of tropical America. Type species: *Warrea discolor* Lindl.

1. **Warszewiczella flabelliformis** (Sw.) Cogn. in Urban, Symb. 4: 182. 1903.

Epidendrum flabelliforme Sw. Prodr. 123. 1788.

Leaves thin, oblanceolate, 3 dm. long or less, 2–5 cm. wide, abruptly acute, tapering to the narrow base. Scape 8–12 cm. long, with a basal sheath 1–2.5 cm. long, a terminal ovate acute or acuminate bract 1–2 cm. long, and a terminal white or bluish flower 5–6 cm. broad; sepals ovate to oblong, acute, 3–3.5 cm. long; petals oblong, acute; lip about 3 cm. long, somewhat quadrangular, the base subcordate, the margins undulate, the disc crested.

On rocks and on bases of trees, Porto Rico, in mountain forests at higher elevations—Jamaica; Cuba (?); Hispaniola; Trinidad; tropical South America.

50. **DICHAEA** Lindl. Gen. & Sp. Orch. 208. 1833.

Leafy epiphytic orchids, the stems tufted or pendulous, monopodial, the leaves small, persistent, sessile, distichous with approximate or imbricated sheaths, the small flowers solitary on axillary peduncles. Sepals distinct, nearly equal. Petals similar to the sepals. Lip usually clawed, concave, entire. Column wingless; clinandrium oblique. Anther terminal, operculate; pollinia 4, waxy, ovoid, unappendaged. Capsule ovoid to oblong. [Greek, referring to the 2-ranked leaves.] About 10 species, natives of tropical America. Type species: *Epidendrum echinocarpum* Sw.

Leaves smooth; lip sessile or short-clawed.

Leaves acute at apex; petals obovate, acute.

Leaves rounded at apex; petals linear, acuminate.

Leaves denticulate, ciliate; lip long-clawed.

1. *D. echinocarpa*.

2. *D. muricata*.

3. *D. hystrixina*.

1. **Dichaea echinocarpa** (Sw.) Lindl. Gen. & Sp. Orch. 208. 1833.

Epidendrum echinocarpum Sw. Prodr. 124. 1788.

Stems pendulous, compressed, 2-edged, densely leafy, 2–6 dm. long. Leaves soft, the blades oblong to oblong-lanceolate, entire, the apex sharply acute or acuminate, 2.5 cm. long or less, 3.5–8 cm. wide; peduncles filiform, 5–15 mm. long, 1–2-bracted at the summit, the bracts ovate, 2–3 mm. long; sepals ovate, acute, yellowish, about 8 mm. long; petals narrowly obovate, a little shorter than the sepals; lip with a very short claw, and a rhomboidal limb 6–7 mm. long, its angles and apex acuminate; capsule ovoid or subglobose, densely echinate, 10–16 mm. long. [*D. pendula* of Cogniaux.]

On trees and rocks in forests of the central and western mountains of Porto Rico;—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; continental tropical America.

2. **Dichaea muricata** (Sw.) Lindl. Gen. & Sp. Orch. 209. 1833.

Cymbidium muricatum Sw. Act. Upsal. 1799: 71. 1799.

Dichaea latifolia Lindl. Gen. & Sp. Orch. 208. 1833.

Stems pendulous, much compressed, 2-edged, densely leafy, 5 dm. long or less. Leaves rather firm in texture, oblong, entire, 1–2 cm. long, 6–9 mm. wide,

rounded at the apex; peduncles about as long as the leaves, filiform, 2-bracted at the summit, the bracts ovate, 1–2.5 mm. long; sepals lanceolate, 7–8 mm. long, yellowish, acuminate; petals linear, acuminate, 5–6.5 mm. long; lip sessile, obovate-rhomboid, the apex rounded, apiculate; capsule oblong-obovoid, densely muricate, 10–18 mm. long.

On trees and rocks in mountain forests, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe and Dominica to Grenada; Margarita; continental tropical America.

3. *Dichaea hystericina* Rehb. f. *Flora* 48: 279. 1865.

Stems tufted, densely leafy, pendulous, compressed, slender, 7–18 cm. long. Leaves soft, nearly linear, more or less echinulate, ciliate, acuminate, 6–10 mm. long, about 2 mm. wide, somewhat twisted; peduncles filiform, 6–9 mm. long, 1-bracted at the summit, the bract ovate, apiculate, about 1.5 mm. long; sepals nearly linear, acuminate, about 7 mm. long; petals lanceolate, about as long as the sepals; lip long-clawed, about 5 mm. long, the limb triangular-hastate, acute; capsule obovoid, pilose-muricate, 8–9 mm. long.

On trees in forests of the Luquillo Mountains:—Cuba; Guadeloupe; Dominica; Grenada.

51. **CAMPYLOCENTRUM** Benth. *Journ. Linn. Soc.* 18: 337. 1881.

Epiphytic orchids, leaf-bearing or leafless, without pseudobulbs, the leaves, when present, distichous, the small flowers in small lateral or basal spikes. Sepals free, narrow, connivent. Petals similar to the sepals, narrower. Lip sessile, spurred at the base, ovate or oblong, 3-lobed, about as long as the sepals. Column short, without a foot. Anther 2-celled; pollinia 2, waxy, globose, not appendaged. Capsule small, dehiscent by 3 apical valves. [Greek, bent spur.] About 20 species, natives of tropical America. Type species: *Todarca micrantha* A. Rich. & Gal.

Plants leaf-bearing; leaves oblong; spikes lateral, solitary or geminate.

Spikes much shorter than the deeply emarginate leaves.

Spikes about as long as the obtuse or retuse leaves.

Plants leafless; spikes fascicled, basal.

Bracts cordate; lip entire.

Bracts ovate; lip 3-lobed.

1. *C. jamaicense*.

2. *C. pygmaeum*.

3. *C. pachyrrhizum*.

4. *C. Sullivantii*.

1. *Campylocentrum jamaicense* (Rehb. f.) Benth.; Fawcett. *Flow. Pl. Jam.* 40. 1893.

Aeranthus jamaicensis Rehb. f. in *Walp. Ann.* 6: 901. 1864.

Stem rather stout, flattened, up to 4 dm. long. Leaves oblong, sessile, spreading, 5–8 cm. long, firm in texture, the apex obliquely 2-lobed, the base narrowed; spikes solitary or geminate, densely several-flowered, nearly sessile, 1–2.5 cm. long; bracts triangular, about 1 mm. long; flowers green; sepals linear, acute, 4 mm. long; petals linear-lanceolate, acute, 4 mm. long; lip 4 mm. long, slightly 3-lobed, the lateral lobes rounded, the terminal one linear-lanceolate, the spur linear, obtuse, 2 mm. long; capsule narrowly oblong, 8–11 mm. long.

On small trees, especially on coffee, in moist parts of the western districts of Porto Rico:—Jamaica; Tobago.

2. *Campylocentrum pygmaeum* Cogn. in *Urban, Symb. Ant.* 4: 183. 1903.

Stem slender, short, 5 cm. long or less, flattened. Leaves oblong, fleshy, small, 6–12 mm. long, obtuse or obliquely subretuse, the base rounded; spikes several-flowered, 1–2 cm. long, the short peduncle angled; bracts acute, about 1 mm. long; sepals triangular-ovate, acute, about 1 mm. long; petals narrowly

linear; lip ovate, acute, entire, a little longer than the petals; spur obovoid, 1 mm. long; capsule oblong-obovoid, about 3 mm. long.

On trees in forests of the Naguabo Mountains near Los Rabanos, Porto Rico:—Guadeloupe.

3. **Campylocentrum pachyrrhizum** (Rchb. f.) Rolfe, Orch. Rev. 11: 246. 1903.

Aeranthus pachyrrhizus Rchb. f. Flora 48: 279. 1865.

Acaulescent; leafless; roots fascicled, elongated, 2–4 dm. long, 3–4 mm. thick. Spikes several, fascicled, short-peduncled, several-many-flowered, 2–4 cm. long; bracts rounded, cordate, apiculate, 3–4 mm. long; sepals linear-lanceolate, entire, acuminate, 4–5 mm. long; spur cylindrical, obtuse, 2 mm. long; capsule ovoid, 7–8 mm. long.

On coffee trees near Mayaguez:—Florida; Jamaica; Cuba; Tobago; Trinidad; British Guiana.

4. **Campylocentrum Sullivani** Fawcett & Rendle, Journ. Bot. 47: 128. 1909.

Acaulescent; leafless; roots fascicled, elongated, 2 dm. long or less, about 2 mm. thick. Spikes several, fascicled, peduncled, rather densely many-flowered, 6 cm. long or less, the axis nearly filiform; bracts ovate, acute, nearly 2 mm. long; sepals ovate, acute, nearly 2 mm. long; petals ovate-oblong, somewhat shorter than the sepals; lip 3-lobed, about 1.5 mm. long and wide, the lateral lobes rounded, the terminal one acute; spur obtuse, 1 mm. long; capsule oblong, about 4 mm. long. [*C. filiforme* of Urban's Flora.]

On trees at lower and middle elevations in moist districts, Porto Rico:—Jamaica. Recorded from Trinidad.

52. **HARRISIELLA** Fawcett & Rendle, Journ. Bot. 47: 265. 1909.

Small acaulescent leafless epiphytes, with basal few-flowered racemes or spikes of minute flowers, the roots elongated, clustered. Sepals distinct, nearly equal. Petals similar to the sepals, but narrower. Lip sessile, about as long as the sepals or longer, its base contracted into a globose spur, its limb keeled, sub-orbicular, entire or slightly 3-lobed. Column short; clinandrium truncate. Anther terminal, operculate; pollinia globose, waxy. Capsule ellipsoid, dehiscent by 6 apical valves. [In honor of William Harris, 1860–1920, Superintendent of Public Gardens and Plantations of Jamaica.] Four known species, of Florida and the West Indies. Type species: *Aeranthus porrectus* Rchb. f.

1. **Harrisiella filiformis** (Sw.) Cogn. in Urban, Symb. Ant. 6: 687. 1910.

Epidendrum filiforme Sw. Prodr. 126. 1788.

Roots filiform, fascicled, 10 cm. long or less. Racemes several, fascicled, flexuous, 2–4.5 cm. long; bracts 1–1.5 mm. long, obtuse; ovary with 6 lines of glands; sepals oblong, the lateral ones acutish, about 2.5 mm. long, the median one obtuse, a little shorter; petals narrowly oblong, obtuse or apiculate, 2 mm. long; lip ovate-orbicular, entire, about 2.5 mm. long and about as broad, the spur 1.5 mm. long; capsule 5–6 mm. long.

On trees near Yauco and Mayaguez:—Jamaica; Hispaniola.

Cattleya labiata Lindl., a showy flowered, often cultivated, Central American orchid, is recorded as found by Sintenis on trees near Coamo, and near Ponce, and by Krebs as formerly grown in St. Thomas.

Catasetum macrocarpum L. C. Rich., occasionally grown in Porto Rico and Virgin Island gardens, native of Trinidad and northern South America has fusiform pseudobulbs up to 2 dm. long, ob.ong-lanceolate leaves and large showy flowers. [*C. tridentatum* Hook.]

A barren orchid found by Sintenis on palm-trunks at Maton-arriba, near Cayey, was recorded by Urban as perhaps a species of *Catasetum*.

Sub-class 2. **DICOTYLEDONES.**

Embryo of the seed with two cotyledons (in a few genera one only), the first leaves of the germinating plantlet opposite. Stem exogenous, of pith, wood and bark (endogenous in structure in Nymphaeaceae), the wood in one or more layers, surrounding the pith, traversed by medullary rays and covered by the bark. Leaves usually pinnately or palmately veined, the veinlets forming a network. Parts of the flower rarely in 3's or 6's.

Dicotyledonous plants are first definitely known in Cretaceous time. They constitute between two-thirds and three-fourths of the living angiospermous flora.

Series 1. **CHORIPETALAE.**

Petals separate and distinct from each other, or wanting.

The series is also known as Archichlamideae, and comprises most of the families formerly grouped under Apetalae (without petals) and Polypetalae (with separate petals). Exceptions to the typical feature of separate petals are found in the Fabaceae, in which the two lower petals are more or less united, in some Crassulaceae, the Polygalaceae, in which the three petals are united with each other, and with the stamens, Oxalidaceae and Illiciaceae, whose five petals are sometimes joined at the base.

‡ *Petals none* (except in family Portulacaceae and in most Alsinaceae which are herbs with the leaves nearly always opposite, the seeds with endosperm, and in some of the SANTALALES).

Calyx none (except sometimes in Casuarinaceae).

Loosely jointed trees, the leaves reduced to verticillate scales.

Plants not loosely jointed; leaves normal.

Herbs, shrubs or trees, with small perfect flowers in spikes.

Trees or shrubs; staminate flowers, and sometimes also the pistillate, in aments.

Leaves simple.

Fruit many-seeded.

Fruit 1-seeded.

Leaves odd-pinnate or trifoliolate; fruit a nut enclosed in a husk, or drupe-like.

Calyx present.

Flowers monoecious, dioecious or polygamous, ovary superior, 1-celled.

Flowers dioecious or perfect; ovary inferior, at least in part.

Ovary 1-celled.

Ovary several-celled (usually 6-celled); flowers perfect.

Flowers mostly perfect; ovary superior.

Embryo straight or nearly so; fruit an achene. •

Embryo coiled, curved or annular; fruit not an achene.

Order 1. CASUARINALES.

Order 2. PIPERALES.

Order 3. SALICALES.

Order 4. MYRICALES.

Order 5. JUGLANDALES.

Order 6. URTICALES.

Order 7. SANTALES.

Order 8. ARISTOLOCHIALES.

Order 9. POLYGONALES.

Order 10. CHENOPODIALES.

†† *Petals present* (wanting in Ceratophyllaceae, aquatic herbs with whorled dissected leaves; in many Ranunculaceae; in Lauraceae, alternate-leaved aromatic trees and shrubs; in Cassythaceae; in some Flacourtiaceae, and Thymeleaceae; in *Xanthoxylum*, pinnate-leaved trees of the Rutaceae; in many Euphorbiaceae; in some Tiliaceae and Rhamnaceae.

A. *Ovary superior, free from the calyx.*

Carpels solitary, or several and distinct (united in some Nymphaeaceae); stamens mostly hypogynous and more numerous than the sepals; sepals mostly distinct.

Order 11. RANALES.

Carpels 2 or more, united into a compound ovary; stamens hypogynous; sepals mostly distinct.

Order 12. PAPAVERALES.

Carpels solitary, or several and distinct, or sometimes united; stamens mostly perigynous or epigynous; sepals mainly united or confluent with the concave receptacle (hypanthium).

Order 13. ROSALES.

Carpels united into a compound ovary; sepals mostly distinct.

Stamens few, rarely more than twice as many as the petals.

Stamens as many as the sepals or fewer and opposite them, or more numerous.

Ovules pendulous, the raphe toward the axis of the ovary.

Order 14. GERANIALES.

Ovules pendulous, the raphe away from the axis of the ovary, or erect, or ascending.

Order 15. SAPINDALES.

Stamens as many as the sepals and alternate with them, opposite the petals when these are present; ovules erect.

Order 16. RHAMNALES.

Stamens usually very numerous (except in Violaceae and Passifloraceae).

Order 17. MALVALES.

Sepals valvate; placentae united in the axis.

Sepals or calyx-segments imbricated or convolute; placentae mainly parietal, sometimes united in the axis.

Leaves bilaterally symmetrical

Sepals separate.

Sepals united.

Leaves oblique

Order 18. HYPERICALES.

Order 19. PASSIFLORALES.

Order 20. BEGONIALES.

B. *Ovary inferior, adnate to the calyx, wholly or in part* (except in Lythraceae where it is usually merely enclosed by it.)

Herbs with barbed or stinging hairs.

Order 21. LOASALES.

Plants without barbed or stinging hairs.

Fleshy spiny plants, with jointed stems, the leaves mostly very small or none; calyx-segments and petals several or numerous.

Order 22. OPUNTIALES.

Herbs, shrubs or trees not fleshy or spiny; calyx-segments rarely more than 5.

Order 23. THYMELEALES.

Petals none in our species

Petals present.

Ovules several or numerous in each cavity of the ovary.

Order 24. MYRTALES.

Ovule 1 in each cavity of the ovary.

Order 25. AMMIALES.

Order 1. CASUARINALES.

Trees or shrubs, with very slender jointed angled branches and twigs, the leaves reduced to minute verticillate scales at the nodes, the scales sometimes connate, the small imperfect bracted flowers in terminal spikes or cone-like heads. Staminate flowers with 1 or 2 sepals and 1 stamen with a large anther. Pistillate flowers without a perianth; ovary small, 1-celled; style short, with 2 slender branches; ovules 1 or 2, ascending. Fruit a cone-like mass of accrescent bracts, subtending winged achenes. Seed with a membranous testa and no endosperm, the embryo straight.

Family 1. CASUARINACEAE Lindl.

BEEF-WOOD FAMILY.

Only one genus, with about 25 species, most abundant in Australasia.

1. CASUARINA Forst. Char. Gen. Pl. 104. 1776.

Characters of the order. [From the zoological name of the Cassowary.]
The following species is typical.

.. *Casuarina equisetifolia* Forst. Char. Gen. Pl. 104. 1776.

A rapidly growing tree, reaching in the American tropics a maximum height of about 20 m., with a trunk up to 1 m. in diameter, much larger in Australia, with long and slender branches, the upper ones erect or nearly so, the dark brown bark furrowed. Twigs angular, very slender, drooping; leaves 6-8 in each whorl, only 1-3 mm. long, acute, appressed, ciliate, decurrent on the twigs; staminate flowers in slender terminal cylindrical spikes 1-4 cm. long, the bracts imbricated, the anthers exerted; pistillate flowers in lateral dense subglobose heads which become about 2 cm. in diameter in fruit.

Locally spontaneous after planting along the coasts, St. Thomas; Porto Rico; St. Croix;—more or less naturalized in Florida, the West Indies and Yucatan. Native of Australia. Much planted for ornament and for hedges and wind-breaks, and valued for its wood; often clipped into decorative forms. BEEF-WOOD. AUSTRALIAN PINE.

Casuarina glauca Sieber and *C. stricta* Dryand., were seen as seedlings at the St. Croix Agricultural Experiment Station in 1923; both are Australian.

Order 2. PIPERALES.

Herbs, shrubs or rarely trees. Leaves with simple blades. Flowers spicate, bracteolate. Perianth wanting. Stamens 2-8 or rarely 10. Gynoecium of 1, or of several distinct or united carpels. Fruit drupaceous.

Ovary superior.
Ovary inferior.

Fam. 1. PIPERACEAE.
Fam. 2. CHLORANTHACEAE.

Family 1. PIPERACEAE H.B.K.

PEPPER FAMILY.

Herbs or shrubs, often climbing, or small trees, with alternate opposite or whorled leaves, usually entire-margined, palmately or pinnately veined. Flowers minute, bracteolate, without a perianth, in catkin-like spikes which are terminal or opposite the leaves, or sometimes axillary or several together on a common peduncle. Stamens mostly 2-6, hypogynous; anthers erect, terminal, their sacs distinct or confluent, longitudinally dehiscent. Ovary superior, sessile or rarely stipitate, 1-celled, 1-ovuled; style 1; ovule erect, orthotropous. Fruit small, indehiscent. Seed solitary, the testa membranous, the endosperm copious, the embryo minute. About 6 genera with over 1000 species, mostly of tropical distribution.

Spikes solitary, rarely 2 together.

Shrubs or trees.

Herbs.

Spikes umbellate; large shrub-like herbs.

1. *Piper*.

2. *Peperomia*.

3. *Pothomorphe*.

1. PIPER L. Sp. Pl. 28. 1753.

Shrubs or woody vines, occasionally small trees, often more or less aromatic, the branches frequently jointed at the nodes. Leaves alternate, the blades usually entire, often unequal-sided and pellucid-dotted. Flowers minute. Spikes opposite the leaves. Bracts peltate or cucullate. Stamens 2-6; filaments short; anthers 2-celled. Ovary sessile; stigmas 2-5. Fruit small, ellipsoid, ovoid or subglobose. [Classical Latin name for pepper.] Over 700 species of wide geographic distribution in warm regions, most abundant in tropical America, known as HIGUELO, PEPPER ELDER and JOINT-WOOD. Type species: *Piper nigrum* L.

- Flowers not borne in a distinct ring or spiral; fruits distinct in the spikes.
- Leaf-blades mostly acute at the base, pinnately veined; fruits globose. 1. *P. blattarum*.
- Leaf-blades usually rounded at the base, palmately veined; fruits ovoid. 2. *P. Amalago*.
- Flowers borne in distinct spirals or rings; fruits in dense spikes.
- Leaf-blades pinnately veined.
- Leaf-blades pinnately veined to the apex; the veins spreading often nearly at right angles to the midvein. 3. *P. Swartzianum*.
- Leaf-blades pinnately veined to the middle or a little above, the veins ascending.
- Leaf-blades rounded or oblique at the base, not deeply cordate; petioles not winged.
- Spikes strongly curved; leaves scabrous. 4. *P. aduncum*.
- Spikes straight or nearly so.
- Spikes slender, 6–15 cm. long.
- Leaf-blades membranous, nearly smooth above. 5. *P. dilatatum*.
- Leaf-blades chartaceous, scabrous above. 6. *P. scabrum*.
- Spikes short, usually less than 6.5 cm. long.
- Leaf-blades long-acuminate. 7. *P. citrifolium*.
- Leaf-blades acute. 8. *P. Treleaseanum*.
- Leaf-blades deeply cordate at the base; petioles winged. 9. *P. auritum*.
- Leaf-blades palmately veined, usually deeply cordate at the base; petioles winged. 10. *P. marginatum*.

1. **Piper blattarum** Spreng. Neue Entd. 2: 100. 1821.

Peperomia blattarum A. Dietr. Sp. 1: 150. 1831.

Enckea blattarum Kunth, Linnaea 13: 600. 1839.

Piper blattarum magnifolium C. DC. Prodr. 16: 329. 1869.

A shrub 2–4 m. tall, with glabrous branches. Leaf-blades chartaceous, pellucid-dotted, elliptic or somewhat ovate, 6–13 cm. long, 3–5.7 cm. broad, acute or acuminate at the apex, the tip sometimes obtuse, usually somewhat inequilateral and acute or somewhat rounded at the base, pinnately 3–5-veined below the middle, usually near the base, glabrous on both surfaces; spikes opposite to and as long as or longer than the leaves, straight or slightly curved; peduncles longer than the petioles.

Mountain woodlands and moist wooded valleys, Porto Rico; St. Thomas (according to Eggers). Recorded by Bello as *Steffensia Jacquemontiana* Kunth. Endemic.

2. **Piper Amalago** L. Sp. Pl. 29. 1753.

Piper medium Jacq. Icon. Rar. 1: 2. 1781.

? *Piper discolor* Sw. Prodr. 15. 1788.

Enckea Sieberi Miq. Syst. 358. 1843.

Enckea Amalago Griseb. Fl. Brit. W. I. 169, in part. 1859.

Piper Sieberi DC. Prodr. 16: 248. 1869.

A shrub 1.5–4 m. tall, or a small tree up to 6 m., the branches glabrous or pubescent. Leaf-blades chartaceous, minutely pellucid-dotted, various in form, lanceolate to elliptic or broadly ovate, 5–15 cm. long, 2–9.5 cm. broad, acuminate at the apex, rounded and occasionally somewhat subcordate at the base, or acutish, palmately veined, glabrous above, puberulent or glabrous beneath, spikes shorter than the leaves or occasionally as long, straight; peduncle as long as or longer than the petiole.

Hillsides, woods, river-banks and thickets at lower and middle elevations, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola;—Cuba to Trinidad; continental tropical America. Recorded by Bello as *Enckea smilacifolia* Kunth. Soor-soor.

3. **Piper Swartzianum** (Miq.) C. DC. Prodr. 16: 265. 1869.

Artanthe Swartziana Miq. Syst. 490. 1844.

A shrub, 3–5 m. high, with puberulent twigs. Leaf-blades coriaceous, oblong-lanceolate, 11–14 cm. long, 3–4 cm. broad, acuminate or somewhat

rounded at the apex, very inequilateral at the base, pinnately veined to the apex, glabrous above, puberulent on the veins beneath, the pellucid glands obscure; spikes as long as the leaves or sometimes longer; peduncle puberulent.

Primeval forests near Penuelas and Utuado:—Hispaniola.

4. **Piper aduncum** L. Sp. Pl. 29. 1753.

Artanthe adunca Miq. Comm. Phyt. 49. 1838.

A shrub 2–6 m. tall with puberulent or glabrate branches. Leaf-blades chartaceous, pellucid-dotted, oblong-elliptic to lanceolate, 12–21 cm. long, 3–8 cm. broad, long-acuminate at the apex, inequilaterally rounded at the base, pinnately veined, scabrous above and often more or less hirtellous beneath, especially on the veins; spikes opposite to and shorter than the leaves, curved; peduncles puberulent, several times as long as the short petioles.

Thickets and hillsides at lower and middle elevations, Porto Rico; Vieques:—Cuba; Jamaica; Hispaniola; St. Vincent to Trinidad; continental tropical America.

5. **Piper dilatatum** L. C. Rich. Act. Soc. Hist. Nat. Paris 1: 105. 1792.

Artanthe Bredemeyeri Griseb. Fl. Brit. W. Ind. 170. 1859.

Piper Bredemeyeri Eggers, Bull. U. S. Nat. Mus. 13: 96. 1879.

A shrub, 2–3 m. tall, the young twigs pilose, sometimes glabrous in age. Leaf-blades membranous, pellucid-dotted, narrowly to broadly elliptic-ovate or elliptic-obovate, 13–26 cm. long, 6–13 cm. broad, long-acuminate at the apex, rounded and very inequilateral at the base, pinnately veined to the middle or below, somewhat scabrous above and pubescent with scattered hairs or glabrous, more or less pilose on the veins beneath; spikes often less than half the length of the leaves, the peduncles equalling or longer or shorter than the short petioles.

Shaded valleys, St. Croix:—Antigua to Trinidad; continental tropical America.

6. **Piper scabrum** Sw. Fl. Ind. Occ. 59. 1797.

Artanthe scabra Miq. Syst. 446. 1844.

Piper hispidum C. DC. in Urban, Symb. Ant. 3: 187. 1902. Not Sw. 1788.

Piper hispidum albescens C. DC. in Urban, Symb. Ant. 3: 188. 1902.

A shrub, 1.5–3 m. tall, the branches often densely pubescent with rather short stiff hairs. Leaf-blades chartaceous, minutely pellucid-dotted, elliptic-lanceolate to broadly elliptic-ovate, 10–22 cm. long, 4–11 cm. broad, acuminate at the apex, rounded or obtuse at the base, scabrous on both sides, hirtellous on the veins beneath, spikes opposite to and shorter than the leaves, straight; peduncles as long as or shorter than the petioles.

Woodlands, ravines and shaded hillsides in moist districts of Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe to Tobago; continental tropical America.

7. **Piper citrifolium** Lam. Tabl. Encycl. 1: 80. 1791.

Artanthe Wydleriana Miq. Syst. 487. 1844.

Piper Wydlerianum C. DC. Prodr. 16: 280. 1869.

A shrub, 1.5–3 m. tall, the branches often hirsute, more or less verrucose. Leaf-blades chartaceous, pellucid-dotted, narrowly to broadly lanceolate, 12–25 cm. long, 4–9 cm. broad, long-acuminate at the apex, inequilaterally rounded or acutish at the base, pinnately veined, glabrous above, pilose on the veins beneath; spikes opposite to and usually less than half the length of the leaves, straight; peduncles pilose, often equalling the short petioles.

Thickets, ravines, river-banks and hillsides at lower and middle elevations, Porto Rico:—Hispaniola; continental tropical America. [? Recorded by Bello as *Ottonia Vahlii* Kunth.]

8. **Piper Treleaseanum** Britton & Wilson.

Piper macrophyllum H.B.K. Nov. Gen. 1: 46. 1815. Not Sw. 1788.
Schilleria macrophylla Kunth, Linnaea 17: 715. 1839.
Artanthe macrophylla Miq. Syst. 423. 1844.

A shrub, 1–3 m. tall with smooth, glabrous branches. Leaf-blades chartaceous, minutely pellucid-dotted, elliptic-oblong to elliptic, 15–24 cm. long, 7.5–12.5 cm. broad, acute or short-acuminate at the apex, more or less inequilaterally rounded and often somewhat subcordate at the base, pinnately veined to beyond the middle, smooth above, finely appressed-pilose on the veins beneath; spikes opposite to and shorter than the leaves, dense, straight; peduncles glabrous, as long as or shorter than the petioles.

Hillsides, ravines and mountain forests, Porto Rico:—Hispaniola; Guadeloupe; Martinique; St. Vincent; Trinidad; continental tropical America.

9. **Piper auritum** H.B.K. Nov. Gen. 1: 54. 1816.

Schilleria aurita Kunth, Linnaea 13: 713. 1839.
Artanthe aurita Miq. Syst. 400. 1844.

An herbaceous shrub 2–5.5 m. tall, with thick stems. Leaf-blades chartaceous, pellucid-dotted, elliptic-ovate to ovate, 15–50 cm. long, 8–31 cm. broad, acute to acuminate at the apex, very inequilateral and deeply cordate at the base, pinnately veined to beyond the middle, more or less pubescent above with short hairs, the pubescence especially conspicuous along the margin of the young leaves, pubescent beneath especially on the veins, or sometimes velvety; spikes slender, opposite to and shorter than the leaves; peduncles usually shorter than the winged-petioles.

A specimen in the herbarium at Kew and another at the New York Botanical Garden are labeled St. Thomas, collected by Friedrichsthal; they are probably from a cultivated plant, as the species is otherwise known in the wild state only from continental tropical America.

10. **Piper marginatum** Jacq. Ic. Rar. 2: 2. 1786.

Schilleria caudata Kunth, Linnaea 13: 716. 1839.
Piper marginatum firmum DC. Prodr. 16: 246. 1869.

A shrub 1–3 m. tall with glabrous branches. Leaf-blades chartaceous, pellucid-dotted, cordate-lanceolate to broadly cordate-ovate, 11–20 cm. long, 6.5–16 cm. broad, acuminate at the apex, palmately veined, glabrous or some, what pilose on both surfaces, the margin ciliate; petioles 2.5–5.5 cm. long, glabrous or pilose, winged; spikes opposite to and usually much shorter than the leaves—often somewhat curved; peduncles 5–17 mm. long.

Moist forests at lower and middle altitudes in Porto Rico:—Cuba; Hispaniola; Saba; Trinidad; Panama; continental tropical America.

Piper incurvum Sibb., recorded from St. Croix by West in 1794, is not otherwise known within the limits of this Flora; it may have been planted on that island. It is a glabrous, somewhat fleshy, trailing or climbing vine, with cordate suborbicular leaves up to 9 cm. broad, the apex short-acuminate, the axillary spikes about 10 cm. long. It inhabits the Lesser Antilles from Guadeloupe to St. Vincent.

Piper retrofractum Vahl, cultivated on St. Thomas, is a climbing woody vine, native of the East Indies, with elliptic subcoriaceous glabrous acuminate leaves 8–16 cm. long, the stout fruiting spikes 4–5 cm. long, about 1 cm. thick, short-stalked.

Piper reticulatum L. of the Lesser Antilles, ranging from St. Eustatius and St. Kitts to Trinidad, was recorded from St. Croix by West in 1794, and may

have been there at that time but nothing is known of it on that island now. It is an erect, glabrous shrub up to 4 m. high, with ovate, 7-9-nerved leaves, the curved spikes 10-15 cm. long.

Piper aequale Vahl, recorded by Krebs as found in St. Thomas prior to 1852, has not been observed there by subsequent botanists; it ranges from Montserrat to Trinidad and northern South America.

Piper asperifolium R. & P., a Peruvian species, was recorded by Krebs from St. Thomas, apparently in error.

2. **PEPEROMIA** R. & P. Prodr. 8. hyponym. 1794; Fl. Per. 1: 29. 1798.

Mostly succulent, annual or perennial herbs, with alternate, opposite or verticillate leaves, the flowers in slender, solitary or clustered spikes, subtended by circular or elliptic bracts. Stamens 2; filaments short. Ovary mostly sessile, sometimes stalked, sometimes beaked; stigma terminal or lateral. Fruit minute, ellipsoid to globose, sessile or stalked, smooth or verruculose, viscid. [Greek, pepper.] Six hundred species or more, mostly of tropical America. Type species: *Peperomia scutellaeifolia* R. & P.

A. Leaves all alternate.

1. Small leaved species, the leaf-blades 2-20 mm. long, the stems slender or filiform (See *P. serpens*).

Fruit stipitate; small delicate vine with orbicular leaves 2-4 mm. long.

Fruit sessile; leaves 4-20 mm. long.

Stem glabrous; leaves orbicular to oval, setulose or glabrate.

Stem pubescent; leaves ovate to obovate, pubescent, at least above.

2. Leaves larger, in some species very large.

a. Prostrate or creeping species, rooting at the nodes.

* Spikes solitary.

Leaves not peltate, orbicular or ovate-orbicular.

Leaves 1-2.5 cm. broad, rounded; spikes 2 cm. long or less.

Leaves 2.5-5 cm. broad, acutish; spikes 3-5 cm. long.

Leaves nearly centrally peltate, broadly ovate, 3-9 cm. long.

** Spikes 2, sometimes 3; leaves ovate, subpeltate.

b. Erect, ascending or tufted species, not rooting at the nodes, or rooting only at lower nodes.

* Plant very stout, the ovate peltate leaves 12-19 cm. long, the 1 or 2 spikes 10-30 cm. long.

** Plants slender or relatively so, the leaves and spikes shorter.

† Leaves, thick, very fleshy, obovate or oblanceolate.

Leaves narrowly obovate or oblanceolate; beak of the berries hooked at the apex.

Leaves broadly obovate or obovate-orbicular; beak of the berries straight.

† Leaves thinner, somewhat fleshy, ovate to ovate-orbicular.

‡ Leaves thin, flaccid, broadly deltoid-ovate, cordate.

‡ Leaves firm, ovate, narrowed or rounded at the base.

§ Leaves black-punctate.

Upper joints with a line of hairs; petioles ciliate.

Plants glabrous.

Leaves broadly ovate.

Leaves oblong to oval.

§§ Leaves not black-punctate.

Plants glabrous.

Leaves oblong to narrowly elliptic, long-acuminate.

Leaves broadly elliptic, acute.

Stem pilose-pubescent.

B. Leaves opposite or verticillate.

Leaves 1.5 cm. long or less.

Leaves opposite or ternate, ciliate.

Leaves quaternate, glabrous.

Leaves 2-5 cm. long.

Leaves opposite or ternate, pubescent on both sides.

Leaves quaternate, glabrous.

1. *P. emarginella*.
2. *P. rotundifolia*.
3. *P. Cogniauxii*.
4. *P. serpens*.
5. *P. urocarpa*.
6. *P. hernandifolia*.
7. *P. distachya*.
8. *P. maculosa*.
9. *P. obtusifolia*.
10. *P. magnoliaefolia*.
11. *P. pellucida*.
12. *P. glabella*.
13. *P. Wheeleri*.
14. *P. myrtifolia*.
15. *P. alata*.
16. *P. dendrophila*.
17. *P. yabucoana*.
18. *P. robustior*.
19. *P. quadrifolia*.
20. *P. humilis*.
21. *P. Myrtillus*.

1. **Peperomia emarginella** (Sw.) DC. Prodr. 16: 437. 1869.

Piper emarginellum Sw. Vet. Handl. Stockh. 1827: 56. 1828.

Acrocarpidium exile Miq. Syst. 56. 1843.

Peperomia exilis Griseb. Fl. Brit. W. I. 164. 1859.

A delicate herb, the filiform stems creeping or pendent, much branched and often matted, up to 4 dm. long, freely rooting at the nodes. Leaf-blades oval to orbicular, 2–4 mm. long, 2–5.5 mm. broad, truncate or emarginate at the apex, rounded, truncate or sometimes slightly cordate at the base, glabrous or pubescent with few long hairs above and on the margin; petioles slender, 1–3 mm. long; spikes terminal, 0.6–12 mm. long, 0.5 mm. thick, rather loosely flowered; fruit oblong-obovoid or ellipsoid, about 0.9 mm. long, 0.3–0.4 mm. broad, the slender stalk nearly half as long as the berry.

On trees, rocks and logs in wet mountain forests of Porto Rico:—Cuba; Jamaica; Hispaniola; Saba to Trinidad.

2. **Peperomia rotundifolia** (L.) H.B.K. Nov. Gen. 1: 65. 1815.

Piper rotundifolia L. Sp. Pl. 30. 1753.

Piper nummulariaefolium Sw. Prodr. 16. 1788.

Peperomia nummulariaefolia H.B.K. Nov. Gen. 1: 66. 1815.

Peperomia rotundifolia pilosior C. DC. in Urban, Symb. Ant. 3: 188. 1903.

A prostrate vine, the slender stems rooting at the nodes. Leaf-blades oval to obovate or suborbicular, 4–12 mm. long, 3.8–12 mm. broad, rounded at the apex, acute or rounded at the base, pubescent with long hairs on both sides or glabrous, the margin sometimes ciliate; petioles 1–7 mm. long, slender; spikes terminal, 7–20 mm. long, 0.6–1.1 mm. thick, rather densely flowered; peduncles 2–6 mm. long; fruit globose-ellipsoid, 0.6–0.7 mm. long, 0.5–0.6 mm. broad.

On trees in forests at middle and higher elevations, Porto Rico:—Cuba; Jamaica; Hispaniola; Antigua to Trinidad; continental tropical America. YERBA DE MEDIO REAL YERBA LINDA.

3. **Peperomia Cogniauxii** Urban, Symb. Ant. 1: 292. 1899.

Peperomia portoricensis Urban, Symb. Ant. 1: 292. 1899.

Stems slender, creeping, rooting at the nodes, pilose, the branches often ascending, 3–6 cm. long. Leaf-blades elliptic to oval, orbicular or obovate, 5–20 mm. long, 3–10 mm. broad, obtuse, subtruncate or slightly emarginate at the apex, acute, obtuse or sometimes rounded at the base, pilose on both surfaces or nearly glabrous, short-petioled; spikes terminal, 2–4 cm. long, 0.6–1 mm. thick; fruit globose-ovoid, 0.5 mm. long, brown.

On trees and logs in mountain forests of Porto Rico:—Hispaniola.

4. **Peperomia serpens** (Sw.) Loud. Hort. Brit. 13. 1830.

Piper serpens Sw. Prodr. 16. 1788.

Peperomia scandens R. & P. Fl. Per. 1: 32. 1798.

Piper scandens Vahl, Enum. 1: 346. 1804.

Piper repens H.B.K. Nov. Gen. 1: 65. 1816.

Stem creeping, often much branched, rooting at the nodes, puberulent. Leaf-blades broadly ovate to deltoid-roundish, 1–2.5 cm. long, 0.8–2.5 cm. broad, obtuse or acutish at the apex, rounded or subtruncate and often somewhat cordate at the base, puberulent; petioles 0.5–2.5 cm. long, slender, puberulent; spikes slender, rather densely-flowered, 7–20 mm. long, long-peduncled; fruit narrowly ellipsoid, 0.7–0.8 mm. long, about 0.4 mm. in diameter, the slender beak more or less curved.

In forests at lower and middle elevations in moist or wet districts, Porto Rico; St. Thomas (according to de Candolle):—Jamaica; Cuba; Hispaniola; St. Eustatius; St. Kitts; St. Vincent; Grenada; Trinidad; continental tropical America.

5. **Peperomia urocarpa** Fisch. & Mey. Ind. Sem. Hort. Petrop. 4: 42. 1837.

Peperomia ionophylla Griseb. Mem. Amer. Acad. II. 8: 175. 1860.

Peperomia major DC. Prodr. 16: 432. 1869.

Stem creeping, rooting at the nodes. Leaf-blades broadly ovate to deltoid, roundish or orbicular-reniform, 2.5–5 cm. long, 2–4.7 cm. broad, acute at the apex, rounded, truncate or sometimes subcordate at the base, pubescent on both sides when young; petioles 1.5–4.5 cm. long, pubescent; spike 3–5 cm. long, 1.1–1.5 mm. thick, long-peduncled; fruit 0.7–0.8 mm. long, 0.4 mm. in diameter, the slender beak usually curved.

In forests and on shaded rocks in the central and western districts of Porto Rico:—Cuba; Hispaniola; Saba; Guadeloupe; continental tropical America.

6. **Peperomia hernandifolia** (Vahl) A. Dietr. Sp. Pl. 1: 157. 1831.

Piper hernandifolium Vahl, Enum. 1: 344. 1804.

Stems creeping, rooting at the nodes. Leaf-blades ovate to broadly ovate, 3–9 cm. long, 2.5–6.7 cm. broad, acuminate at the apex, rounded or sometimes cordate at the base, peltate at about $\frac{1}{3}$ or $\frac{1}{4}$ of the length from the base, more or less minutely puberulent and pale beneath; petioles 3–10 cm. long, puberulent; spike 2–5 cm. long, about 2 mm. broad; long-peduncled; fruit ellipsoid or ovoid-ellipsoid, 0.8–0.9 mm. long, with a slender curved beak.

Mountain forests at middle and higher elevations in Porto Rico:—Jamaica; Cuba; Hispaniola; Saba to Trinidad; central and South America.

7. **Peperomia distachya** (L.) A. Dietr. Sp. Pl. 1: 156. 1831.

Piper distachyon L. Sp. Pl. 30. 1753.

Peperomia producta Griseb. Fl. Brit. W. Ind. 166. 1859.

Stems climbing or creeping, rooting at the nodes, glabrous or puberulent. Leaf-blades membranous, narrowly to broadly elliptic or ovate, 4–13 cm. long, 2–6 cm. broad, acuminate to long-acuminate at the apex, rounded, often subcordate and usually very shortly peltate at the base, often puberulent beneath when young especially near the base and along the midrib; petioles 2–8.5 cm. long; spikes often 2, densely flowered, 2–4.5 cm. long, 1–1.2 mm. thick; fruit narrowly ellipsoid, 0.8–0.9 mm. long, 0.3–0.4 mm. in diameter, the subulate beak nearly as long as the berry, often slightly curved.

On trees, logs and rocks in mountain forests at middle and higher elevations, Porto Rico:—Cuba; Jamaica; Hispaniola.

8. **Peperomia maculosa** (L.) W. Hook. Exot. Fl. pl. 92. 1825.

Piper maculosum L. Sp. Pl. 30. 1753.

Stem sparingly puberulent or glabrous, 5 mm. thick or thicker, green, mottled with brownish-crimson blotches. Leaf-blades ovate-elliptic to broadly ovate, 12–19 cm. long, 7–10.8 cm. broad, short-acuminate at the apex, rounded or subcordate at the base, shortly peltate, pubescent beneath; petioles stout, 7–17 cm. long, pubescent; spikes 10–30 cm. long, about 5 mm. thick below, densely-flowered; fruit ellipsoid, 0.9–1 mm. long, 0.5 mm. in diameter with a slender curved beak.

Primeval forests at high elevations in the central mountains of Porto Rico:—Cuba; Jamaica; Hispaniola.

9. **Peperomia obtusifolia** (L.) A. Dietr. Sp. Pl. 1: 154. 1831.

Piper obtusifolium L. Sp. Pl. 30. 1753.

Peperomia emarginata R. & P. Fl. Per. 1: 33. 1798.

Peperomia macropoda Miq. Linnaea 20: 128. 1827.

Peperomia obtusifolia genuina Dahlst. Vet. Akad. Handl. 33: 64. 1900.

Peperomia obtusifolia macropoda Dahlst. loc. cit. 65. 1900.

Peperomia obtusifolia emarginata Dahlst. loc. cit. 66. 1900.

Stems glabrous, erect or decumbent, rooting at the lower nodes, simple or branched. Leaves thick and fleshy, oblanceolate or obovate, 4.5–11 cm. long, 3–6 cm. broad, rounded and occasionally retuse or emarginate at the apex, acute or cuneate at the base, glabrous; petioles 1.5–4 cm. long; spikes densely flowered, solitary or geminate, terminal; fruit ellipsoid, 0.9–1 mm. long, the slender beak about 0.5 mm. long, hooked at the apex.

Mountain forests and cliffs at middle and higher elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Martinique; St. Vincent; Florida; continental tropical America.

10. **Peperomia magnoliaefolia** (Jacq.) A. Dietr. Sp. Pl. 1: 153. 1831.

Piper magnoliaefolium Jacq. Coll. 3: 210. 1789.

Peperomia amplexicaulis magnoliaefolia Griseb. Fl. Brit. W. I. 167. 1859.

Peperomia magnoliaefolia Sintenisiana Dahlst. Vet. Akad. Handl. 33: 59. 1900.

Peperomia magnoliaefolia brevisrostrata Dahlst. loc. cit. 61. 1900.

Peperomia magnoliaefolia microphylla Dahlst. loc. cit. 61. 1900.

Stem glabrous, erect or decumbent, rooting at the lower nodes, often simple. Leaves thick and fleshy, broadly obovate or obovate-orbicular, 5–13 cm. long, 3–7 cm. broad, obtuse or rounded at the apex, cuneately narrowed at the base, glabrous, the petioles 1–4 cm. long; spikes solitary or several, densely flowered; fruit ellipsoid, 0.7–0.8 mm. long, the beak straight, often rather stout, half the length of the berry. [*Piper obtusifolium* of Krebs, not of Linnaeus.]

On trees and rocks in woodlands and forests in moist or wet districts, Porto Rico; Vieques; St. Thomas; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America.

11. **Peperomia pellucida** (L.) H.B.K. Nov. Gen. 1: 64. 1815.

Piper pellucidum L. Sp. Pl. 30. 1753.

A glabrous herb, 1–3.5 dm. tall, with erect branching stems. Leaf-blades membranous, deltoid-ovate, 1.4–3.5 cm. long, 1.3–3 cm. broad, acuminate at the apex, subtruncate or rounded and usually cordate at the base; petioles 6–12 mm. long, clasping; spikes lax-flowered, slender, 1.5–5 cm. long, 0.6–1 mm. thick; peduncles 4–7 mm. long; fruit subglobose, 0.5–0.6 mm. in diameter.

On walls and on the ground, rarely in ravines, at lower elevations, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix; Tortola:—Jamaica; Cuba to Trinidad; continental tropical America. Also recorded from western Africa and the East Indies.

12. **Peperomia glabella** (Sw.) A. Dietr. Sp. Pl. 1: 156. 1831.

Piper glabellum Sw. Prodr. 16. 1788.

Peperomia caulibarbis Miq. Syst. 98. 1843.

Stem creeping and rooting, terete, the branches ascending, with two inconspicuous ridges decurrent from the petioles and sometimes ciliate. Leaf-blades ovate-lanceolate to ovate, 2.5–4 cm. long, 1.2–2.5 cm. broad, acute or acuminate and occasionally ciliate at the apex, cuneate at the base, black-dotted, 3-nerved, occasionally with two accessory nerves; the petioles 0.5–1 cm. long, usually ciliate; spikes filiform, usually densely flowered, 5–12 cm. long; fruit ovoid, 0.5–0.7 mm. long, slightly curved upward and attached laterally at the base.

On trees and rocks in forests and ravines, Porto Rico, ascending to high altitudes; St. Thomas; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; St. Martin; Central and South America. Races differ in size and shape of leaves.

13. **Peperomia Wheeleri** Britton, sp. nov.

Stems erect, branched, glabrous, 2.5 dm. or more high. Leaves alternate, subcoriaceous, elliptic-ovate to broadly ovate, 3–5.5 cm. long, 2–3.5 cm. broad, obtuse at the apex, acute or somewhat rounded at the base, rather inconspicu-

ously black-dotted, the petioles 4–9 mm. long; spikes slender, 9 cm. long, 2 mm. thick; peduncles about as long as the petioles; fruit subglobose, 0.9 mm. long, 0.7 mm. in diameter.

On rocks, Signal Hill, Culebra (*Britton & Wheeler 130*).

14. **Peperomia myrtifolia** (Vahl) A. Dietr. Sp. Pl. 1: 147. 1831.

Piper myrtifolium Vahl, Enum. 1: 341. 1804.

(?) *P. Hamiltoniana emarginulata* C. DC. in Urban, Symb. Ant. 3: 238. 1902.

Plant glabrous, the stems erect, 3 dm. high or more. Leaves rhombic-oblong to oval, 3.3–5 cm. long, 1.5–2.3 cm. broad, obtuse at the apex, acute at the base, black-dotted; petiole about 4 mm. long, equalling the peduncle; spikes densely flowered.

On rocks, Vieques; St. Croix; Virgin Gorda (?). Endemic. Doubtfully recorded in "Vegetation of Vieques Island" as *P. Hamiltoniana* Miq., a Jamaican species, which is also attributed to St. Croix by Fawcett and Rendle.

15. **Peperomia alata** R. & P. Fl. Per. 1: 31. 1798.

Peperomia dendrophila Griseb. Fl. Br. W. I. 165, in part. 1859. Not Schl. 1830.

Glabrous, the erect or decumbent stems with three narrow wings, of which two are decurrent from the petioles. Leaves alternate, elliptic-lanceolate, 4.5–10 cm. long, 2–3.5 cm. broad, long-acuminate at the apex, acute at the base, without black dots; petioles 4–8 mm. long; spikes slender, 6–18 cm. long, 1–1.3 mm. broad; fruit ovoid, 0.5–0.7 mm. long, 0.4–0.5 mm. in diameter.

Mountain forests at middle and higher elevations in Porto Rico; St. Croix;—Cuba; Jamaica; Hispaniola; Grenada; South America.

16. **Peperomia dendrophila** Schl. Linnaea 5: 74. 1830.

Peperomia Sintenisii C. DC. in Urban, Symb. Ant. 3: 240. 1902.

Glabrous, the stem erect or decumbent, branched, rooting at the lower nodes, with two inconspicuous ribs decurrent from the petioles. Leaves alternate, broadly elliptic, 2.8–7 cm. long, 1.5–3.5 cm. broad, acute at the apex, acute or somewhat rounded at the base, without black dots; petioles 4.5–8 mm. long; spikes 5–10 cm. long, 1.8–2 mm. thick; fruit globose-ovoid, 0.7–0.8 mm. long, 0.5–0.6 mm. in diameter.

Mountain forests, Porto Rico;—Jamaica; Mexico.

17. **Peperomia yabucoana** Urban & C. DC. in Urban, Symb. Ant. 3: 232. 1902.

Peperomia velutina Urban, Symb. Ant. 1: 293. 1899. Not Linden & André, 1872.

Stems rooting below at the nodes, pilose, the branches erect or ascending. Lower leaf-blades suborbicular, 1–2 cm. in diameter, the upper ones ovate, 2–3 cm. long, 1.5–2 cm. broad, obtuse at the apex, rounded at the base, puberulent on both sides, 5-nerved, the margin ciliate; spikes terminal, 5.5 cm. long, 1 mm. thick, long-peduncled; fruit ovoid, sessile, glabrous.

On rocks, near Yabucoa. Endemic.

18. **Peperomia robustior** Urban, Symb. Ant. 4: 191. 1903.

Peperomia Swartziana Griseb. Fl. Br. W. Ind. 167, in part. 1859.

Peperomia tenerrima f. *robustior* Dahlst. Vet. Akad. Handl. 33: 185. 1900.

Peperomia Grisebachii C. DC. in Urban, Symb. Ant. 3: 259, in part. 1902.

Stem creeping, rooting at the nodes, the branches erect or ascending. Leaves opposite, or ternate, the blades narrowly-obovate or obovate, 5–9 mm. long, 3–5 mm. broad, rounded and sometimes slightly emarginate at the apex, 3-nerved at the base, impressed-punctate beneath, the margin short-ciliate; spikes solitary, terminal, 1.5–2 cm. long.

Creeping on trees or logs at high elevations in forests of the eastern mountains of Porto Rico. Endemic.

19. **Peperomia quadrifolia** (L.) H.B.K. Nov. Gen. 1: 69. 1816.

Piper quadrifolium L. Sp. Pl. ed. 2, 43. 1762.

Stem rooting below at the nodes, the branches erect or ascending, 6–12 cm. long. Leaves 4 or 5 in a whorl, the blades obovate, 8–16 mm. long, 4.5–10 mm. broad, rounded and emarginate at the apex, cuneate at the base, glabrous, short-petioled; spikes slender, solitary, terminal, densely flowered, 1–3.5 cm. long, 1.5–1.9 mm. thick, the slender peduncle 1–2 cm. long; fruit ovoid, 0.6–0.7 mm. long.

On trees in woodlands of the western mountains of Porto Rico;—Cuba; Jamaica; Hispaniola; continental tropical America.

20. **Peperomia humilis** (Vahl) A. Dietr. Sp. Pl. 1: 168. 1831.

Piper humile Vahl, Enum. 1: 349. 1804.

Peperomia Langsdorffii Miq. Syst. 116. 1843.

Stems erect, 1–3 dm. or more tall, simple or branched, pilose. Leaves opposite or ternate, obovate or occasionally somewhat elliptic, 1–5 cm. long, 0.6–2.3 cm. broad, rounded, obtuse or acutish at the apex, cuneate at the base, more or less densely pilose on both sides, ciliate, 3-nerved; the slender petioles 4–15 mm. long, pilose; spikes slender, 4–12 cm. long, 1–1.5 mm. thick, lax-flowered; fruit elliptic-ovoid, 0.6 mm. long, 0.4–0.5 mm. in diameter.

Hillsides at lower elevations. Porto Rico; Vieques; Mona; Desecheo; St. Thomas; St. Croix; St. Jan; Tortola;—Florida; Hispaniola; Antigua; continental tropical America. Recorded by de Candolle as *P. ciliata* H.B.K.

21. **Peperomia Myrtilus** Miq. Syst. 154. 1843.

Peperomia rhombea C. DC. in Urban, Symb. Ant. 3: 268, in part. 1902.
Not R. & P. 1798.

Plant erect, 7–30 cm. high. Leaves 3 or 4 in a whorl, occasionally only 2, opposite, oblong-lanceolate to elliptic-lanceolate, 1–3 cm. long, 5–11 mm. broad, more or less acuminate at the apex, the tip obtuse, acute or cuneate at the base, glabrous, indistinctly 3–5-nerved, short-petioled; spikes terminal and axillary, densely flowered, 3–6.5 cm. long, about 2 mm. thick; fruit mucronate with an apical appendage.

On rocks and trees in forests of the central mountains of Porto Rico;—Cuba; Jamaica; Hispaniola.

Peperomia guadalupensis C. DC., recorded by de Candolle and by Fawcett and Rendle from St. Croix, collected by West prior to 1793, is unknown there at the present time. It is a glabrous plant, with elliptic-lanceolate, black punctate leaves, similar to *P. myrtifolia*, in which it was included by Dahlstadt, and from which the St. Croix specimen may not be distinct. [*Piper tenuiflorum* Vahl; *Piper acuminatum* of West, and perhaps of Krebs, not of Linnaeus; *Peperomia acuminata* of Eggers, in part.]

Peperomia polystachya (L.) Hook., recorded from St. Croix by Hooker and by subsequent authors, is unknown there at the present time, and no specimens to illustrate its occurrence there appear to have been preserved. It is a

pubescent species with opposite or ternate obovate-rhombic leaves, apparently occurring only in Jamaica. Eggers recorded it from St. Croix, St. Thomas and St. Jan. [*Piper polystachya* L.]

Peperomia Rupertiana C. DC., of the Lesser Antilles, perhaps occurs on St. Jan; we have doubtfully referred a barren specimen from Rosenberg, St. Jan, to this species.

Peperomia arifolia Miquel, Brazilian, grown for ornament in Porto Rican gardens, has broadly ovate peltate, acute or acuminate, long-petioled, white-veined leaves 5–10 cm. long, its spikes up to 18 cm. long.

Peperomia incana (Spreng.) A. Dietr., Brazilian, grown by Mr. A. S. Fairchild at Louisenhøj, St. Thomas, the plants brought from the Copenhagen Botanical Garden, is a white-tomentose species with suborbicular leaves and long spikes. [*Piper incanum* Spreng.]

Peperomia amplexicaulis (Sw.) A. Dietr., endemic in Jamaica, was recorded by Krebs as found in St. Thomas, evidently in error. [*Piper amplexicaule* Sw.]

3. POTHOMORPHE Miq. Comm. Phyt. 36. 1840.

[HECKERIA Kunth, *Linnaea* 13: 564. 1839. Not Raf. 1838.]

Large herbs with alternate broad entire pellucid-dotted leaves. Spikes umbellate on axillary peduncles. Bracts peltate, the margin villose-fimbriate. Flowers sessile, perfect. Stamens 2; filaments filiform, short; anthers reniform, 1-celled. Ovary sessile; stigmas 3, sessile, recurved. Fruit minute, angled. Seed 3-angled. [Greek, simulating the genus *Pothos*.] A few species, mostly natives of tropical America. Type species: *Piper umbellatum* L.

1. **Pothomorphe peltata** (L.) Miq. Comm. Phyt. 37. 1840.

Piper peltatum L. Sp. Pl. 30. 1753.

Piper umbellatum L. Sp. Pl. 30. 1753.

Heckeria peltata Kunth, *Linnaea* 13: 565. 1839.

Heckeria umbellata Kunth, loc. cit. 569. 1839.

Pothomorphe umbellata Miq. Comm. Phyt. 36. 1840.

Piper peltatum hirtellum C. DC. in Urban, *Symb. Ant.* 3: 210. 1902.

Sometimes 2 m. tall, with glabrous or pubescent branches. Leaves suborbicular, flaccid, 16–35 cm. long, 14–34 cm. broad, often peltate, acute at the apex, cordate at the base, glabrous, or puberulent on the nerves on both sides, finely pellucid-dotted, palmately veined, the central nerve with one or two pinnate nerves on each side; petioles glabrous or puberulent, 0.8–2 dm. long; common peduncle shorter than the leaf-stalk, 1–7 cm. long, glabrous or puberulent; spikes 4–10; individual peduncles 7–12 mm. long; fruit 0.5–0.6 mm. long.

Forests, shaded banks and along streams, Porto Rico; St. Thomas; St. Croix; Tortola:—West Indies (except Bahamas); continental tropical America. BASQUINA. MONKEY'S-HAND.

Family 2. CHLORANTHACEAE Blume.

CHLORANTHUS FAMILY.

Aromatic shrubs or trees. Leaves opposite, the bases of the petioles connately united by a stipular sheath. Inflorescence terminal and axillary. Flowers perfect or unisexual. Staminate flowers in catkin-like spikes,

without a perianth; anthers 2-celled. Pistillate flowers in panicles or sometimes cone-like spikes; perianth superior, inconspicuous; ovary inferior, 1-celled; ovule solitary, orthotropous, pendulous. Fruit drupe-like. Embryo minute at the base of copious endosperm. About 3 genera and 40 species, American, Asiatic and Australasian.

1. **HEDYOSMUM** Sw. Prodr. 84. 1788.

Shrubs or trees with pinnately veined leaves. Flowers monoecious or dioecious. Staminate flowers without bracts. Anther single, oblong, the cells longitudinally dehiscent. Pistillate flowers with a short 3-lobed perianth. Drupe 3-angled. [Greek, referring to the aromatic odor.] About 22 species, natives of the West Indies and South America. Type species: *Hedyosmum nutans* Sw.

1. **Hedyosmum arborescens** Sw. Prodr. 84. 1788.

Tafallaea arborescens Kuntze, Rev. Gen. 2: 566. 1891.

A glabrous dioecious shrub, or a small tree 5-6 m. tall. Leaf-blades narrowly oblong-elliptic to elliptic, 4-18 cm. long, 2-5.5 cm. broad, abruptly short-acuminate at the apex, acute at the base, serrate; staminate spikes nearly cylindrical, 1.5-2.4 cm. long, about 5 or 6 mm. thick; pistillate flowers paniculate, in clusters of two or three enclosed by bracts; drupe 3-3.5 mm. long.

Forests of the eastern mountains of Porto Rico:—Jamaica; Guadeloupe to St. Vincent. The wood and the roots are fragrant.

Order 3. **SALICALES.**

Trees or shrubs, with imperfect small flowers in aments. Sepals and petals none. Leaves simple. Fruit a many-seeded capsule. Seeds with a tuft of hairs at one end. Only one family.

Family 1. **SALICACEAE** Lindl.

WILLOW FAMILY.

Dioecious trees or shrubs with light wood, bitter bark, brittle twigs, and alternate stipulate leaves, the stipules often minute and caducous. Flowers solitary in the axil of each bract. Staminate flowers consisting of from one to numerous stamens inserted on the receptacle, subtended by a gland-like or cup-shaped disk; anthers 2-celled, the sacs longitudinally dehiscent. Pistillate aments sometimes raceme-like; pistillate flowers a 1-celled ovary subtended by a minute disk; placentae 2-4, parietal; ovules usually numerous, anatropous; stigmas 2-4, simple or 2-4 cleft. Seeds small or minute, provided with a dense coma of long, mostly white silky hairs. Endosperm none. Cotyledons plano-convex. Radicle short. Two genera and upward of 250 species, mostly natives of the north temperate and arctic zones.

2. **SALIX** [Tourn.] L. Sp. Pl. 1015. 1753.

Trees or shrubs, with single-scaled buds, the scales with an adherent membrane within, mostly narrow and short-petioled leaves and persistent or early deciduous broad or minute stipules. Bracts of the aments entire. Disk gland-

like, small or minute. Staminate aments dense, erect, spreading or drooping. Staminate flowers with 1-10, mostly 2, stamens, their filaments distinct or some times united. Pistillate aments usually erect or spreading. Ovary sessile or short-stipitate. Style short or filiform. Stigmas 2, entire or 2-cleft. Capsule mostly 2-valved. [Name, ancient.] About 200 species, of wide geographic distribution throughout the north temperate and arctic zones a few in the southern hemisphere. Type species: *Salix alba* L.

1. **Salix chilensis** Molina, Sagg. Chil. 169. 1782.

Salix Humboldtiana Willd. Sp. Pl. 4: 657. 1806.

A tree sometimes 20 m. tall, with nearly erect branches, the trunk up to 4 dm. thick, the dark brown bark ridged and fissured. Leaves glabrous, linear, 6-14 cm. long, 3-7 mm. wide, acuminate at the apex, acute or somewhat rounded at the base, serrate, the petioles 1.5-3.5 mm. long; catkins 3-7 cm. long, terminal on leafy shoots, appearing with the leaves; bracts woolly, deciduous; stamens 4-7; capsule ovoid, glabrous, 4-4.5 mm. long, stalked.

Locally persistent after planting, Porto Rico; St. Croix:—Jamaica; Cuba; Martinique; St. Vincent; Texas and Mexico; Central America. Native of South America. Often planted for ornament and interest in the West Indies. HUMBOLDT'S WILLOW. SAUCE.

Salix baby'onica L., WEEPING WILLOW, SAUCE LLORON, with drooping branches recorded as observed by Krug spontaneous near Mayaguez, is not persistent in the climate of Porto Rico.

Order 4. MYRICALES.

Shrubs or small trees, with simple leaves and small monoecious or dioecious flowers in aments. Perianth none. Ovary 1-celled; style short; stigmas 2. Ovule erect, orthotropous. Endosperm none. Only one family.

Family 1. MYRICACEAE Dumort.

BAYBERRY FAMILY.

Leaves alternate, mostly coriaceous and aromatic. Flowers solitary in the axils of the bracts. Staminate flower with 2-16 (usually 4-8) stamens inserted on the receptacle; filaments short; anthers ovate, 2-celled, the sacs longitudinally dehiscent. Ovary subtended by 2-8 bractlets; stigmas linear. Fruit a small drupe or nut, the exocarp often waxy. Seed erect. Cotyledons plano-convex. Radicle short. Two genera and about 36 species.

1. **MYRICA** L. Sp. Pl. 1024. 1753.

Leaves entire, dentate or lobed, mostly resinous-dotted. Staminate aments oblong or narrowly cylindric, expanding before or with the leaves. Stamens 4-8. Pistillate aments ovoid or subglobose; ovary subtended by 2-4, mostly short, bractlets. Drupe globose or ovoid, its exocarp waxy. [Ancient Greek name of the Tamarisk.] About 35 species, widely distributed. Type species: *Myrica Gale* L.



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

Cerothamnus ceriferus Small, Fl. Miami 61. 1912.

A slender dioecious shrub, or a tree, sometimes 12 m. high, with a trunk 5 dm. in diameter, the bark gray, nearly smooth. Leaves narrow, oblong or oblanceolate, mostly acute, entire or sparingly dentate, narrowed at the base, fragrant, short-petioled, dark green above, paler and sometimes pubescent beneath, golden-resinous, 2-8 cm. long, unfolding with or before the aments; staminate aments cylindric; pistillate aments short, oblong; ripe drupes globose, bluish white, waxy, tipped with the base of the style, long-persistent.

Hillsides and thickets in moist districts at lower and middle elevations in Porto Rico:—southeastern United States; Bermuda; Bahamas; Cuba; Hispaniola. WAX-BERRY. BAY-BERRY. CERERO. ARRAYAN.

Several Asiatic species of *Quercus* (OAKS) of the family *Fagaceae*, received from the Bureau of Plant Industry, were experimentally planted at the Forest Station, Rio Piedras in the autumn of 1922, and in the spring of 1923 were reported as having done well; these include *Q. Thomsonii* Miquel; *Q. Lindleyana* Wall., *Q. fenestrata* Roxb. and *Q. polystachya* Wall.

Q. palustris Du Roi, the SWAMP OAK, or PIN OAK of the eastern United States was also experimentally planted.

Castanea diversifolia Kurz, East Indian, also of the Family *Fagaceae*, planted at the Forest Station in the autumn of 1922, grew vigorously, attaining a height of about 2 meters by April, 1923.

Order 5. JUGLANDALES.

Trees with alternate pinnately compound or trifoliolate leaves, and monoecious or dioecious bracteolate flowers, the staminate in long-drooping aments, the pistillate solitary or several together. Staminate flowers consisting of 3-numerous stamens with or without an irregularly lobed perianth adnate to the bractlet, very rarely with a rudimentary ovary. Anthers erect, 2-celled, the sacs longitudinally dehiscent; filaments short. Pistillate flowers with a 3-5-lobed calyx or with both calyx and petals, and a 1-celled or 2-4-celled ovary. Ovules solitary or 2, erect, orthotropous; style 1 or 2. Fruit a drupe with indehiscent or dehiscent, fibrous, fleshy or woody exocarp, enclosing the bony endocarp or nut which is 2-4-celled. Seed large, 2-4-lobed. Endosperm none Cotyledons corrugated.

Family 1. JUGLANDACEAE Lindl.

WALNUT FAMILY.

Characters of the order. Six genera and about 35 species, mostly of the warmer parts of the north temperate zone.

1. *JUGLANS* L. Sp. Pl. 997. 1753.

Trees, with spreading branches, superposed buds, fragrant bark, and odd-pinnate leaves, with nearly or quite sessile leaflets, the terminal one sometimes early perishing. Staminate flowers in drooping cylindric aments, borne on the

twigs of the previous year; perianth 3-6-lobed; stamens 8-40 in 2 or more series. Pistillate flowers on a terminal peduncle at the end of shoots of the season, the calyx 4-lobed, with 4 small petals adnate to the ovary at the sinuses; style fimbriate, very short. Drupe large, globose or ovoid, the exocarp somewhat fleshy, fibrous, indehiscent, the endocarp bony, rugose or sculptured, 2-4-celled at the base, indehiscent, or in decay separating into 2 valves. [Name a contraction of the Latin *Jovis glans*, the nut of Jupiter.] About 12 species, natives of the north temperate zone, 2 in the West Indies, several in the Andes of South America. Type species: *Juglans regia* L.

1. *Juglans jamaicensis* C. DC. in DC. Prodr. 16^o: 138. 1864.

A forest tree 20-25 m. tall, the twigs, petioles and rachis rufous-pubescent. Leaves 3 dm. long or more; leaflets 13-19, lanceolate, oblong lanceolate or ovate-lanceolate, more or less inequilateral, acuminate at the apex, rounded or subcordate at the base, sessile or very short-petioled, serrate, glabrous or very nearly so above, pubescent on the veins beneath, 6-10 cm. long, 3-4 cm. broad; drupes short-ovoid, 4.5-5 cm. long, 4 cm. broad; nut corrugated, 3.3-3.5 cm. long, 2.8-3.2 cm. broad, acute at the apex, impressed at the base.

Local in forests of the western mountains of Porto Rico.—Hispaniola. Recorded from Jamaica, apparently erroneously. [*Juglans cinerea* of Bello, not of Linnaeus.] In Kew Bulletin, 1894: 138, 371, the Porto Rican tree is erroneously reported to be the same as the Cuban endemic species *J. insularis* Griseb. NOGAL. PALO DE NUEZ. WALNUT.

Juglans regia L., EUROPEAN WALNUT, MADEIRA NUT, experimentally planted in Porto Rico, has leaves similar to those of the native species, the nut with a nearly smooth thin shell, the seed delicious.

Hicoria Pecan (Marsh.) Britton, PECAN NUT, North American, also experimentally planted, is a pinnate-leaved tree, the 11-15 oblong-lanceolate leaflets 1-1.5 dm. long, the oblong-cylindric fruit 3-6 cm. long with a thin, 4-valved husk, the seed of the smooth oblong nut delicious. [*Juglans Pecan* Marsh; *Carya oliviformis* Nutt.]

Order 6. URTICALES.

Trees, shrubs or herbs, with alternate or opposite leaves, the flowers with a calyx but without a corolla, small, monoecious, dioecious or polygamous. Stamens often as many as the sepals. Ovary 1- or 2-celled. Fruit an achene, a samara, drupe, syncarp or synconium. Endosperm often scant or wanting.

- | | |
|---|---------------------|
| Fruit a drupe, sometimes nut-like, or a samara. | Fam. 1. ULMACEAE. |
| Fruit an achene, the achenes sometimes enveloped by the accrescent sepals and forming a syncarp. | |
| Trees, shrubs or occasionally herbs, usually with a milky sap; ovule often pendulous; fruit a syncarp or synconium. | Fam. 2. MORACEAE. |
| Herbs, sometimes shrubs or small trees, the sap not milky; ovule erect; fruit neither a syncarp nor a synconium. | Fam. 3. URTICACEAE. |

Family 1. ULMACEAE Mirbel.

ELM FAMILY.

Trees or shrubs with watery sap. Leaves alternate, simple, stipulate, the stipules usually small, fugacious. Flowers small, monoecious, dioecious, perfect or polygamous, clustered, or the pistillate sometimes solitary. Perianth in our genera 4-5-parted or of 4 or 5 distinct sepals. Petals none. Stamens as many as the perianth-lobes or sepals and opposite them; filaments

straight; anthers erect in the bud, 2-celled, longitudinally dehiscent. Ovary 1-celled (rarely 2-celled); ovules solitary, suspended from the apex of the cell, anatropous or amphitropous; styles or stigmas 2. Fruit a samara, drupe or nut. Endosperm little or none. Embryo straight or curved; cotyledons mostly flat. About 13 genera and 140 species, widely distributed in temperate and tropical regions.

Stigmas 2-cleft; plants usually armed with stipular spines.

1. *Momisia*.

Stigmas entire; plants unarmed.

Segments of the staminate perianth imbricate; pistillate perianth deciduous.

2. *Celtis*.

Segments of the staminate perianth valvate; pistillate perianth persistent.

3. *Trema*.

1. **MOMISIA** F. G. Dietr. Vollst. Lex. Gaertn. Nachtr. 5: 122. 1819.

Woody vines, small trees or shrubs, sometimes high-climbing by recurved stipular spines. Flowers polygamo-monoecious, at least the staminate in elongated axillary cymes. Calyx 4- or 5-lobed, deciduous. Stamens 4 or 5, exerted; filaments longer than the extrorse anthers. Ovary 1-celled. Stigmas 2-cleft. Drupe ovoid or globose, with a more or less flattened, reticulated or tuberculate stone. [Name unexplained.] Several species of temperate and tropical regions. Type species: *Mertensia laevigata* H.B.K.

1. **Momisia iguanaea** (Jacq.) Rose & Standley, Contr. U. S. Nat. Herb. 16: 8. 1912.

Rhamnus iguanaeus Jacq. Enum. Pl. Carib. 16. 1760.

Celtis aculeata Sw. Prodr. 53. 1788.

Celtis iguanaeus Sarg. Silva N. A. 7: 64. 1895.

Mertensia laevigata H.B.K. Nov. Gen. 2: 31. 1817.

Celtis aculeata serrata Griseb. Fl. Br. W. I. 149. 1859.

A woody vine, up to 7 m. long, armed with short recurved spines, the young twigs, petioles and branches of the inflorescence puberulent. Leaf-blades oblong-ovate, ovate or oval, 5-13 cm. long, 2.5-7 cm. broad, acute to short-acuminate at the apex, rarely obtuse, entire or coarsely crenate-serrate above the middle, rounded or cordate and often slightly inequilateral at the base, glabrous or nearly so on both sides, short-petioled; flowers in short or paniculate axillary cymes; stigmas linear, bifid; drupes globose-ovoid, 8-12 mm. long, usually much longer than the pedicel. [*Zizyphus reticulata* of Stahl, not of de Candolle.]

Thickets and woodlands, Porto Rico; Icacos; Culebra; Desecheo; Vieques; St. Thomas; St. Jan; St. Croix; Tortola.—Florida; West Indies (except Bahamas); continental tropical America. COCKSPUR. AZUFAIFO.

2. **CELTIS** [Tourn.] L. Sp. Pl. 1043. 1753.

Unarmed trees or shrubs, with serrate or entire, pinnately veined, or in some species 3-5-nerved leaves. Flowers polygamo-monoecious, or rarely monoecious, borne in the axils of the leaves, the staminate often clustered, the fertile solitary or 2-3 together. Calyx 4-5-lobed, deciduous. Stamens 4 or 5; filaments incurved; anthers extrorse, loosely attached just above the base. Ovary sessile, 1-celled; stigmas 2, recurved or divergent. Fruit a globose or ovoid drupe, the exocarp pulpy, the bony endocarp at length splitting into two valves. Seed-coat membranous. Embryo curved. [Name ancient, used by Pliny for an African species of *Lotus*.] About 60 species of temperate and tropical regions. Type species: *Celtis australis* L.

1. *Celtis trinervia* Lam. Encyc. 4: 140. 1797.

Sponia trinervia Dcne. Nouv. Ann. Mus. Paris 3: 498. 1834.

A slender tree, up to 18 m. high or higher, the smooth bark gray. Leaf-blades ovate-lanceolate to ovate, 4–13 cm. long, 2–7.5 cm. broad, acuminate at the apex, usually rounded on one side at the base and acute on the other, serrate, in age often covered with minute black elevated dots, glabrous or slightly pubescent; petioles 4–11 mm. long, pubescent; flowers in loose axillary cymes, or the fertile ones sometimes solitary; stigmas linear; drupe purple-black, 7–8 mm. long, about as long as the pedicel or longer; the pit subglobose, rugose.

Thickets and forests; southern dry districts of Porto Rico; Mona; St. Thomas; St. Croix; St. Jan; Tortola.—Cuba; Jamaica; Hispaniola. [*C. australis* of Krebs, not of Linnaeus.]

3. **TREMA** Lour. Fl. Coch. 562. 1790.

Trees or shrubs, unarmed. Leaves alternate, toothed, 3-nerved at the base. Flowers small, mostly monoecious or polygamous, greenish or whitish, in axillary cymes, the perfect mostly fertile. Sepals of the pistillate flowers induplicate-valvate, those of the perfect flowers slightly imbricated. Stamens 4 or 5. Ovary sessile. Stigmas 2. Ovule pendulous. Drupe ovoid or subglobose, surrounded by the persistent perianth; endosperm fleshy, usually scant. [Greek, a hole.] About 30 species of tropical and subtropical regions. Type species: *Trema cannabina* Lour.

Leaves acute, 2–6 cm. long, 0.6–2.5 cm. broad; veins prominent beneath.

1. *T. Lamarckiana*.

Leaves acuminate, 6–15 cm. long, 2.5–5 cm. broad; veins not prominent.

2. *T. micrantha*.

1. **Trema Lamarckiana** (R. & S.) Blume, Mus. Bot. Lugd. 2: 58. 1853.

Celtis Lima Lam. Encyc. 4: 140. 1797. Not Sw. 1788.

Celtis Lamarckiana R. & S. Syst. 6: 311. 1820.

Sponia Lamarckiana Dcne. Nouv. Ann. Mus. Paris 3: 498. 1834.

Trema Lima Hitchc. Rep. Mo. Bot. Gard. 4: 129. 1893. Not Blume, 1853.

A tree, up to 10 m. high, the trunk sometimes 3 dm. in diameter, or more often a shrub 1.5–3.5 m. high, the twigs slender, rough-pubescent. Leaf-blades lanceolate to ovate, 2–6 cm. long, 0.6–2.5 cm. broad, occasionally larger, acute at the apex, equilateral or inequilateral at the base, very rough above, reticulate-veined and finely tomentose beneath; flowers about 2 mm. in diameter, the staminate clusters sessile, the pistillate short-stalked; drupe ovoid, 2.8–3 mm. long, glabrous.

Thickets and hillsides, Porto Rico.—Florida; Bermuda; Bahamas; Cuba; Jamaica; Hispaniola; Saba to St. Vincent.

2. **Trema micrantha** (L.) Blume, Mus. Bot. Lugd. 2: 58. 1853.

Rhamnus micranthus L. Syst. ed. 10, 937. 1759.

Celtis micranthus Sw. Prodr. 53. 1788.

Celtis rugosa Willd. Sp. Pl. 996. 1806.

Sponia micrantha Dcne. Nouv. Ann. Mus. Paris 3: 498. 1834.

Trema micranthum obtusatum Urban, Symb. Ant. 4: 195. 1905.

A tree, sometimes 18 m. tall, the bark gray-brown, slightly fissured, the branches pubescent with rather stiff, whitish hairs. Leaf-blades oblong-lanceolate to lanceolate-ovate, 6–15 cm. long, 2.5–5 cm. broad, acuminate at the apex, rarely obtuse, often somewhat inequilateral and cordate, rounded or occasionally subtruncate at the base, rough above, pubescent on the nerves beneath, or

glabrescent, not reticulate-veined; cymes equalling or twice as long as the petioles; flowers greenish-yellow; drupes ovoid, 2.8–3 mm. long, glabrous.

Woodlands and hillsides, Porto Rico; St. Thomas; St. Croix; St. Jan; Tortola; Cuba to Trinidad; continental tropical America. The light brown wood is weak and soft. PALO DE CABRA. GUACIMILLA.

Sponia stipellata Bello, Anales Soc. Esp. Hist. Nat. 12: 109. 1883.

This was described from foliage only and has not been identified by subsequent botanists. Urban questions its reference to this family.

Family 2. MORACEAE Lindl.

MULBERRY FAMILY.

Trees or shrubs, usually with milky sap, rarely herbs. Leaves alternate, entire, toothed, or sometimes lobed, stipulate. Flowers monoecious or dioecious, in catkin-like spikes, or heads, on a flat entire or lobed receptacle, or on the inside of a closed receptacle. Staminate flowers with a 2–4-lobed or 2–4-parted perianth, or perianth tubular, or sometimes wanting; stamens usually as many as the perianth-lobes and opposite them, rarely only 1; petals none. Pistillate flowers with a 3–5-parted perianth, or sometimes tubular with a small opening at the top; ovary superior or more or less inferior, 1- or 2-celled; style or stigmas 1 or 2; ovule solitary, pendulous, anatropous, or erect and orthotropous. Fruit a syncarp or synconium. Seeds with little or no endosperm; embryo straight or curved; cotyledons often unequal, usually thick. About 55 genera and over 900 species, natives of temperate and tropical regions.

Trees or shrubs.

Flowers borne on the inner wall of a closed fleshy receptacle.

Flowers not borne on the inner wall of a closed receptacle.

Flowers dioecious, involucrate, the staminate in heads, the pistillate solitary.

Flowers dioecious or monoecious, not involucrate.

Flowers in solitary or paired axillary spikes or heads.

Staminate and pistillate flowers spicate; staminate flowers with a 4-parted perianth, the stamens 4; pistillate perianth tubular, 4-toothed.

Staminate flowers spicate, the pistillate in dense heads.

Flowers dioecious; perianth of both staminate and pistillate flowers 4-parted, the stamens 4.

Flowers monoecious; perianth of the staminate flowers 2–4-lobed or -parted, the stamen 1; pistillate perianth tubular.

Flowers in dense spikes clustered at the apex of a long axillary peduncle, enclosed at first in a spathe-like caducous bract.

Herbs, acaulescent; flowers monoecious, imbedded in the long-peduncled, flat, simple or lobed, androgynous receptacle.

1. *Ficus*.

2. *Pseudolmedia*.

3. *Trophis*.

4. *Chlorophora*.

5. *Artocarpus*.

6. *Cecropia*.

7. *Dorstenia*.

1. **FICUS** [Tourn.] L. Sp. Pl. 1059. 1753.

Trees or shrubs, sometimes woody vines, with milky sap, and alternate, rarely opposite leaves. Flowers monoecious, borne on the inner walls of closed fleshy, subglobose, pyriform or ovoid, sessile or stalked, axillary receptacles, with an involucre of bracts at the base, the mouth (ostiolum) closed by imbricated bracts; calyx of the staminate flowers usually divided into 2–6 sepals; stamens 1 or 2; filaments short, erect, the anther innate or adnate, 2-celled, the cells longitudinally dehiscing. Sepals of the pistillate flowers often fewer and narrower than in the staminate, or sometimes wanting; ovary 1-celled, the solitary ovule pendulous, anatropous; styles excentric; stigma club-shaped. Achenes.

immersed in the thickened succulent receptacle. Seed pendulous; testa membranous; embryo incurved; endosperm fleshy; cotyledons equal or unequal; radicle incumbent. [Ancient Latin name.] About 600 species of tropical and warm regions, known as **JAGUEY** and **WILD FIGS**. The wood of the Porto Rico species is soft, weak and not durable. Type species: *Ficus Carica* L.

- Ostium immersed in the receptacle, surrounded by an elevated ring.
 Ostium not immersed in the receptacle.
- | | |
|---|-----------------------------|
| Receptacle 4.5–10 mm. in diameter; basal bracts 1–4 mm. long. | 1. <i>F. crassinervia</i> . |
| Primary lateral veins of the leaves numerous, close together; receptacle 4.5–6 mm. in diameter. | 2. <i>F. Sintensisii</i> . |
| Primary lateral veins of the leaves few, distant; receptacle 7–10 mm. in diameter. | |
| Peduncles slender, 4–20 mm. long, 0.6–1 mm. thick; petioles 1.5–4 cm. long. | 3. <i>F. laevigata</i> . |
| Peduncles stout, 3–7 mm. long, 1.6–2.5 mm. thick; petioles 1–2 cm. long. | 4. <i>F. Stahlii</i> . |
| Receptacle 1.5–2 cm. in diameter; basal bracts 9–12 mm. long. | 5. <i>F. Urbaniana</i> . |

1. **Ficus crassinervia** Desf.; Willd. Sp. Pl. 4: 1138. 1806.

A tree, occasionally 20 m. high, the twigs grayish-brown or brown, pubescent. Leaves ovate, oblong or oval, 6–17 cm. long, 3.5–10 cm. broad, rounded or occasionally acutish at the apex, rounded and often subcordate at the base, the petioles 1–3.5 cm. long; primary lateral veins distant, the secondary reticulate; receptacles in pairs in the axils of the leaves, subglobose, 1–1.4 cm. in diameter, often somewhat verrucose; ostium immersed in the receptacle; basal bracts about 2 mm. long, the peduncles 2–5 mm. long.

Hillsides, rocky woodlands, and forests, Porto Rico; Vieques; St. Thomas; St. Croix; Tortola.—Cuba; Guadeloupe; Martinique; St. Lucia. Recorded by Eggers as *Ficus trigonata* L.

2. **Ficus Sintensisii** Warb. in Urban, Symb. Ant. 3: 464. 1903.

A tree, sometimes reaching a height of 20 m. with glabrous or puberulent twigs. Leaves elliptic to oval, occasionally somewhat elliptic-obovate, 3–7.5 cm. long, 1.5–3.6 cm. broad, often rather abruptly acute or acuminate at the apex, acute or rounded at the base, glabrous, the petioles 6–12 mm. long; veins rather prominent, close together and parallel; receptacles usually in pairs in the axils of the leaves, subglobose, 4.5–6 mm. in diameter; ostium prominent; basal bracts about 1.5 mm. long, the peduncles slender, 4–8 mm. long. [? *Ficus pertusa* of Sessé & Moç.]

Mountain forests, Porto Rico. Endemic.

3. **Ficus laevigata** Vahl, Enum. 2: 183. 1805.

Ficus populnea Willd. Sp. Pl. 4: 1141. 1806.

Ficus lentiginosa Vahl, Enum. 2: 183. 1805.

Ficus pedunculata Vahl, Enum. 2: 184. 1805.

Ficus brevifolia Nutt. Sylva 2: 3. 1846.

Urostigma laevigatum Miq. in Hook. Lond. Jour. Bot. 6: 539. 1847.

Urostigma sanctae-crucis Liebm. in Vidensk. Selsk. Skrift. V. 2: 328. 1851.

Ficus thomaea Miq. Ann. Mus. Lugd. Bot. 3: 299. 1867.

Ficus sanctae-crucis Miq. Ann. Mus. Lugd. Bot. 3: 299. 1867.

Ficus portoricensis Urban, Symb. Ant. 1: 472. 1900.

Ficus populnea laevigata portoricensis Warb. in Urban, Symb. Ant. 3: 474. 1903.

Ficus populnea laevigata thomae Warb. in Urban, Symb. Ant. 3: 474. 1903.

Ficus populnea laevigata sancti-joannis Warb. in Urban, Symb. Ant. 3: 475. 1903.

Ficus populnea laevigata sanctae-crucis Warb. in Urban, Symb. Ant. 3: 475. 1903.

Ficus populnea laevigata pedunculata Warb. in Urban, Symb. Ant. 3: 475. 1903.

Ficus populnea lentiginosa subcordata Warb. in Urban, Symb. Ant. 3: 476. 1903.

Ficus populnea lentiginosa obliquicuspis Warb. in Urban, Symb. Ant. 3: 477. 1903.

Ficus laevigata genuina portoricensis Urban, Symb. Ant. 4: 198. 1905.

Ficus laevigata lentiginosa subcordata Urban, Symb. Ant. 4: 198. 1905.

Ficus laevigata lentiginosa obliquicuspis Urban, Symb. Ant. 4: 198. 1905.

A tree, sometimes reaching a height of 20 m., or shrub-like. Leaves ovate, elliptic, oval or oblong, 3–17 cm. long, 2–9 cm. broad, glabrous, acute, acuminate or occasionally obtuse at the apex, rounded truncate or obtuse and often subcordate at the base, long-petioled, the upper surface bearing numerous minute elevated papillae, or sometimes with pores, finely reticulate-veined beneath; receptacles usually in pairs in the axils of the leaves, globose or globose-ovoid, 7–10 mm. in diameter; ostiolum more or less prominent; basal bracts 1–3 mm. long, the peduncle slender, 4–20 mm. long.

Coastal thickets and hillsides at lower elevations, Porto Rico; Icacos; Culebra; Vieques; St. Thomas; St. Croix; St. Jan; Tortola.—Florida; Bahamas to Barbados. A species consisting of numerous races differing in size of foliage and fruits, and in the length of the peduncle. BOISLAGLU.

4. **Ficus Stahlia** Warb. in Urban, Symb. Ant. 3: 470. 1903.

A tree, 10–15 m. tall, with smooth bark and rather stout light-brown twigs. Leaves oblong to ovate or broadly elliptic, occasionally obovate, 8–17 cm. long, 5–9 cm. broad, rounded or obtusely short-acute at the apex, obtuse or rounded at the base, glabrous, the petioles 1–2 cm. long; primary lateral veins distant, the secondary veins finely reticulate; receptacles usually in pairs in the axils of the leaves, subglobose, about 1 cm. in diameter; ostiolum prominent; basal bracts 2–4 mm. long, usually puberulent; peduncles 3–4 mm. long.

Limestone hills at lower elevations, Porto Rico; Mona. Endemic. Very similar to *Ficus mamillifera* Warburg of Jamaica.

5. **Ficus Urbaniana** Warb. in Urban, Symb. Ant. 3: 459. 1903.

A medium sized or large tree. Leaves ovate, oval or obovate, 12–23 cm. long, 7–14.5 cm. broad, rounded or obtuse at the apex, usually rounded and often subcordate at the base, glabrous, the petioles rather stout, 3–6 cm. long; primary lateral veins distant, the secondary veins finely reticulate beneath; receptacles usually in pairs in the axils of the leaves, subglobose, 1.5–2 cm. in diameter, finely pubescent or nearly glabrous, the ostiolum sometimes nearly flat; basal bracts 9–12 mm. long, puberulent, the peduncle very short and stout or none.

In woods and occasionally planted on St. Croix.—Antigua; St. Martin; St. Eustatius; Guadeloupe; Martinique; St. Vincent. Recorded by Eggers and by Millspaugh as *Ficus crassinervia* Desf.

Ficus Carica L., HIGO, EDIBLE FIG, of the Mediterranean region, grown for its fruit in Porto Rico and the Virgin Islands, forms a small tree up to about 6 m. high, with stout branches, rough-pubescent, suborbicular or oval, palmately 3–7-lobed cordate leaves, the obovoid fruit 3–7 cm. long.

Ficus elastica Roxb., INDIA RUBBER FIG, RUBBER PLANT, Asiatic, grown for shade and ornament in Porto Rico and the Virgin Islands, reaches a height of 12 meters or more, with widely spreading branches and numerous stout pendent aerial roots; it has smooth shining elliptic entire many-veined leaves 1.5–3 dm. long, the small ellipsoid fruit sessile.

Ficus nitida Thunb., LAUREL DE INDIA, grown for shade and for ornament in Porto Rico and the Virgin Islands, is a densely leafy tree up to 20 m. in height, with glabrous, dark green, elliptic leaves 5-7 cm. long, acute at both ends, the globose fruits about 7 mm. in diameter, sessile. [*F. arbutifolia* Link.]

Ficus pumila L., CREEPING FIG, Asiatic, commonly grown on walls in Porto Rico and occasionally in the Virgin Islands, is a small-leaved vine, adhering to walls by its numerous aerial roots; it sends out horizontal branches with larger ovate or elliptic leaves 5-8 cm. long, and obovoid figs about 5 cm. long.

Ficus lyrata Warburg, LYRATE-LEAVED FIG, African, experimentally grown by Mr. A. S. Fairchild at Louisenhøj, St. Thomas, is a tree with coriaceous obovate, strongly few-veined leaves up to 3 dm. long or longer, narrowed at or below the middle, cordate and stout-petioled, the obovoid fruit about 2 cm. long.

Ficus benjamina L., Malayan, a tree with drooping branches, glabrous throughout, the ovate shining, abruptly acuminate, subcoriaceous leaves 4-10 cm. long, the subglobose red figs sessile, 1-1.5 cm. in diameter, is occasionally planted for ornament in Porto Rico and the Virgin Islands.

Ficus serratus L., in the list of St. Thomas plants by Krebs, is an error of some kind; *Ficus serrata* L. is an Arabian species.

A species of *Ficus* with coriaceous glabrous entire pinnately few-veined leaves up to 3 dm. long, the petioles stout and short, occasionally planted in Porto Rico, has not been specifically identified; young trees only were seen.

2. PSEUDOLMEDIA Trec. Ann. Sci. Nat. III. 8: 129. 1847.

Forest trees with milky sap, entire or slightly repand pinnately veined leaves, and small caducous intrapetiolar stipules. Flowers dioecious. Staminate flowers in sessile involucre axillary heads; perianth wanting; stamens numerous on a receptacle within the involucre, intermixed with stalked spatulate scales. Pistillate flower solitary in the involucre, axillary, the perianth tubular with a small opening at the apex; ovary enclosed in the perianth; stigma bifid, exserted; ovule pendulous. Fruit ovoid, enclosed by the more or less fleshy perianth. Pericarp crustaceous. Cotyledons fleshy, unequal. [False *Olmedia*.] About 5 species, natives of the West Indies and continental tropical America. Type species: *Pseudolmedia havanensis* Trec.

1. *Pseudolmedia spuria* (Sw.) Griseb. Fl. Br. W. I. 152. 1859.

Brosimum spurium Sw. Prodr. 12. 1788.

Pseudolmedia havanensis Trec. Ann. Sci. Nat. III. 8: 130. 1847.

A tree, sometimes 15 m. high, or higher, with slender light-brown twigs. Leaves oblong-elliptic, 8-16 cm. long, 2.8-6 cm. broad, rather abruptly acuminate at the apex, more or less inequilateral and acutish or obtuse at the base, dark green and glabrous above, paler, glabrous and finely reticulate-veined beneath, the petioles 2.5-7 mm. long; bracts of the staminate heads suborbicular, pubescent; fruit ellipsoid, 1 cm. long.

Forests, Porto Rico:—Cuba; Jamaica; also recorded from Panama. NEGRA LORA.

3. TROPHIS [P. Br.] L. Sp. Syst. ed. 10, 1289. 1759.

Trees with milky sap. Leaves pinnately veined, entire or toothed, those of the shoots sometimes lobed, the stipules lateral, small, caducous. Flowers dioecious. Staminate flowers in dense cylindric solitary or paired axillary spikes; perianth 4-parted; stamens 4, the filaments inflexed in bud, becoming straight, exserted; ovary rudimentary. Pistillate flowers in few-flowered solitary or

sometimes paired axillary spikes; perianth tubular or tubular-ovoid, adnate to the ovary, 4-toothed; style 2-parted, persistent; ovule pendulous. Fruit somewhat fleshy. Embryo straight; cotyledons fleshy, semiglobose; radicle short, superior. [Greek, fodder.] Five or six species, natives of the West Indies and continental tropical America, the following typical.

1. **Trophis racemosa** (L.) Urban, Symb. Ant. 4: 195. 1905.

Bucephalon racemosum L. Sp. Pl. 1190. 1753.

Trophis americana L. Syst. ed. 10, 1289. 1759.

A tree, occasionally reaching a height of 15 m., the young twigs brown, pubescent. Leaves oblong-elliptic or elliptic, 9-20 cm. long, 3-8.5 cm. broad, acuminate at the apex, acutish or rounded at the base, finely reticulate-veined beneath, glabrous, entire or somewhat sparingly toothed, the petioles 6-14 mm. long; staminate spikes short-peduncled, 4-10 cm. long, about 7 mm. thick, velutinous; pistillate spikes 1-2 cm. long, velutinous; fruit subglobose or globose-ovoid, 8-12 mm. long, reddish brown.

Wooded limestone hills and thickets at lower and middle elevations, Porto Rico—Cuba; Jamaica; Hispaniola; continental tropical America. The leaves are used for fodder. RAMON. RAMONCILLO.

4. **CHLOROPHORA** Gaud. Bot. Freyc. Voy. 508, 509. 1826.

Trees with tough close-grained wood, and yellowish milky sap, the young shoots often, and the older branches occasionally, armed with slender axillary spines. Leaves pinnately veined, entire or variously toothed, those of the shoots often shallowly or deeply pinnately lobed; stipules caducous. Flowers dioecious. Staminate flowers in dense slender-peduncled axillary catkin-like spikes; perianth 4-parted; stamens 4, the filaments inflexed in bud, becoming straight; ovary rudimentary. Pistillate flowers in dense axillary heads; perianth 4-parted, the segments concave; bracts small, similar to the perianth-segments, sometimes thickened on the inside at the apex; ovary oblique; style lateral, filiform, exerted, the long stigmatic surface undivided; ovule laterally affixed, descending. Fruit fleshy; achene compressed, oblique at the apex; embryo with equal cotyledons. [Greek, green-bearer.] Two species, the following typical one native of the West Indies and continental tropical America, the other of tropical Africa.

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

Morus tinctoria L. Sp. Pl. 986. 1753.

Broussonetia tinctoria H.B.K. Nov. Gen. 2: 32. 1817.

Broussonetia Plumieri Spreng. Syst. 3: 901. 1826.

Maclura tinctoria D. Don.; Steud. Nomencl. ed. 2, 87. 1841.

Maclura xanthoxylon Endl. Gen. Suppl. 4: 34. 1847.

A tree, sometimes reaching a height of 20 m., the twigs light-brown, often pubescent. Leaves lanceolate to ovate-elliptic or elliptic, 5-12 cm. long, 1.5-5.3 cm. broad, acuminate at the apex, rounded, subtruncate or cordate at the base, glabrous or somewhat pubescent on both surfaces, entire or toothed, short-petioled; staminate spikes cylindrical, 4-12 cm. long, about 4 mm. thick, short-peduncled; pistillate flowers in subglobose heads 6-10 mm. in diameter; fruit 12-14 mm. in diameter, short-peduncled.

Hillsides and woodlands, Porto Rico; Mona; Vieques; St. Thomas; St. Jan (according to Eggers); St. Croix—Cuba and Jamaica to Trinidad and Curacao; continental tropical America. The hard strong durable yellowish wood is used for furniture and in construction and yields a valuable dye. MORA. PALO DE MORA. FUSTIC.

5. **ARTOCARPUS** Forst. Char. Gen. 101. 1776.

Milky-juiced trees, some with edible fruits. Leaves often large, coriaceous, entire or pinnately lobed, pinnately veined; stipules various. Flowers monoecious; the staminate in rather stout cylindrical catkin-like spikes; perianth 2–4-lobed or parted, the lobes valvate or slightly imbricate; stamen 1, the filament erect, pistil wanting. Pistillate flowers in axillary or terminal, subglobose or ellipsoid heads, often mixed with peltate bracts, the perianth tubular, with a small opening at the apex; ovary straight; style entire or 2-lobed; ovule solitary, pendulous. Fruit a large fleshy oblong, cylindrical or globose receptacle. Achenes sunk in the receptacle. Seeds without endosperm; embryo straight or incurved; cotyledons fleshy; radicle short. [Greek, bread-fruit.] About 40 species, natives of Ceylon and the East Indies. Type species: *Artocarpus communis* Forst.

1. **Artocarpus communis** Forst. Char. Gen. 102. 1776.

Artocarpus incisa L. f. Suppl. 411. 1781.

A tree, 8–12 m. high, or sometimes higher, with spreading branches, the bark gray and smooth. Leaves 3–9 dm. long, 2.8–4.5 dm. wide, dark green and often pubescent with rather long scattered hairs on the veins above, paler, scabrous, finely reticulate-veined and somewhat pubescent beneath, cuneate and entire at the base, deeply pinnately lobed, the lobes acuminate; staminate spikes dense, club-like, 2.5–4 dm. long, the filament broad, as long as the perianth; pistillate heads subglobose, long-peduncled; fruit large, up to 3 dm. long, subglobose or oval, edible.

Hillsides and valleys, spontaneous after cultivation, Porto Rico; St. Thomas; St. Jan; St. Croix.—widely cultivated for its fruit and seeds in all tropical regions, some races seedless. Native of the islands of the Pacific Ocean. The strong yellowish wood, with a specific gravity of about 0.49, is used for furniture and in construction. PAN. PALO DE PAN. BREAD FRUIT.

Artocarpus integrifolia L., JACK-FRUIT, East Indian, occasionally planted in Porto Rico and the Virgin Islands, is a large tree with ovate, usually entire, acute leaves, its fruit similar to that of the preceding species.

6. **CECROPIA** L. Syst. ed. 10, 1286. 1759.

Trees with milky juice, often rather sparingly branched, the branches hollow with septa at intervals. Leaves large, usually palmately lobed, more or less peltate, long-petioled, frequently white-tomentose beneath; stipules large, connate, intrapetiolar. Flowers dioecious, in dense spikes clustered at the apex of the axillary peduncle within a large spathe-like caducous bract. Staminate spikes dense, slender, cylindrical, perianth tubular; stamens 2, the filaments straight, scarcely exerted; rudimentary ovary wanting. Pistillate spikes dense, the perianth tubular with a small opening at the apex; ovary included; style short; stigma penicillate, exerted; ovule erect, orthotropous. Fruit oblong-ellipsoid. Cotyledons equal; radicle superior. [Greek, referring to the use of the wood in making wind instruments.] Some 35 or 40 species, natives of the West Indies and tropical continental America. Type species: *Cecropia peltata* L.

1. **Cecropia peltata** L. Syst. ed. 10, 1286. 1759.

Ambaiba peltata Kuntze, Rev. Gen. Pl. 623. 1891.

A tree, 12–20 m. high, with few spreading branches, the gray bark thin, smooth. Leaves orbicular, 3–4 dm. broad, 7–9-lobed, dark green and scabrous

above, densely clothed beneath with white tomentum; petioles thick, 3 dm. or more long; staminate spikes numerous, about 4 cm. long, 3 mm. thick; short-peduncled pistillate spikes 2-6, sessile, 5-6 cm. long, much thicker than the staminate, yellowish. [*Cecropia obtusa* of Cook and Collins.]

Hillsides, forests and ravines, Porto Rico, in moist and wet districts, ascending to at least 900 m.; Vieques; St. Thomas; St. Croix; St. Jan.—Cuba and Jamaica to Trinidad; also in northern South America. The branches are hollow, the old trunks solid, the soft wood nearly white. LLAGRUMO. TRUMPET-TREE. TRUMPET-WOOD.

7. **DORSTENIA** [Plum.] L. Sp. Pl. 121. 1753.

Acaulescent herbs. Leaves basal, entire or lobed, often membranous, the stipules lateral, distinct, usually persistent. Flowers monoecious, imbedded in the usually long-peduncled solitary, flat, simple or lobed, androgynous receptacle. Perianths more or less connate and adnate to the receptacle. Staminate flowers with 1-3 stamens, the filaments at first inflexed, becoming straight. Pistillate flowers more deeply imbedded in the receptacle than the staminate, the mouth of the perianth almost closed; ovary included; style lateral or excentric, bifid; ovule pendulous. Fruits small, at length protruded from the pits. Endocarp crustaceous; cotyledons contorted. [Named in honor of Theodor Dorsten, professor of medicine at Marburg, Germany, died 1539.] About 50 species, of tropical America and Africa, one in Asia. Type species: *Dorstenia contrajerva* L.

1. **Dorstenia contrajerva** L. Sp. Pl. 121. 1753.

An acaulescent herb with long-petioled leaves, the rhizome erect, 2.5-5.5 cm. long. Leaves oblong-ovate, deltoid-ovate, oval or orbicular in outline, deeply lobed or entire, 6-20 cm. long, 7-22 cm. broad, glabrous or with scattered hairs on both sides, the petioles 0.8-2.5 dm. long; receptacles entire or lobed, peltate, 1.5-3 cm. long, 1.5-3.5 cm. broad, pubescent on the back, the scape slender, 0.7-3 dm. long.

Rich woods, Porto Rico:—St. Martin; Guadeloupe, Martinique; St. Vincent; Grenada; Trinidad; continental tropical America. TUSILLA.

Castilla elastica Cerv., CENTRAL AMERICAN RUBBER, has been planted occasionally in Porto Rico. It is a large tree, the sap milky, containing caoutchouc, the pubescent leaves elliptic-obovate, 2-5 dm. long, acuminate, short-petioled, the monoecious flowers capitate, both staminate and pistillate in the same clusters.

Morus nigra L., MORA, BLACK MULBERRY, native of Asia, has been planted for its fruit in Porto Rico. It is a tree, sometimes up to 15 meters high, with broadly ovate, serrate leaves 15 cm. long or less, occasionally somewhat lobed, glabrous when mature; the monoecious flowers are in drooping spikes 3-6 cm. long, the staminate ones with a 4-parted perianth and 4 stamens, the pistillate with a similar perianth, a sessile ovary and 2 linear stigmas. The fruit is a dense fleshy oblong purple or nearly black spike 2-3 cm. long, delicious.

Morus multicaulis Peff., Chinese, experimentally planted in Porto Rico, its leaves a food for silk worms, is a shrub or small tree, with leaves similar to those of the Black Mulberry but rougher, the flowers similar, the black sweet fruit smaller.

Morus alba L., WHITE MULBERRY, European and Asiatic, planted in Porto Rico and St. Croix, differs in having white fruit about 2 cm. long.

Brosimum guianense Grosourdy, recorded by the author as Porto Rican, called GATEADO, has not been identified by subsequent botanists.

Family 3. **URTICACEAE** Rehb.

NETTLE FAMILY.

Annual or perennial herbs, shrubs, or occasionally trees, sometimes armed with stinging hairs, often with dot-like or linear cystoliths. Leaves alternate or opposite, simple, entire, toothed or sometimes lobed; those of a pair often unequal. Stipules usually present. Flowers small, greenish, dioecious, monoecious or polygamous, in axillary, simple or compound, often congested cymes, or in globose clusters, the clusters sessile in the axils or at the nodes or along the rachis of a spike. Calyx 2-5-cleft, or of distinct sepals. Petals none. Stamens as many as the calyx-lobes or sepals and opposite them, reduced to staminodia in the pistillate flowers, or none; filaments distinct; anthers opening lengthwise. Ovary superior, 1-celled; style simple; ovule solitary, erect or ascending, orthotropous. Fruit small, an achene. Endosperm oily, usually not copious; embryo straight, with thick flat, often broad cotyledons. About 40 genera and 550 species of wide geographic distribution.

Flowers without involucre.

Pistillate perianth 2-5-parted.

Shrubs or small trees.

Herbs.

Leaves alternate; plants armed with stinging hairs.

Leaves opposite; plants without stinging hairs.

Pistillate perianth tubular, 2-4-toothed or entire.

Stigma persistent.

Stigma deciduous.

Pistillate flowers involucrete by 2 bracts.

1. *Urera*.

2. *Fleurya*.

3. *Pilea*.

4. *Boehmeria*.

5. *Pouzolzia*.

6. *Rousselia*.

1. **URERA** Gaud. Bot. Voy. Freyc. 496. 1830.

Shrubs, sometimes climbing, or trees, often with stinging hairs, the alternate petioled leaves entire or toothed, the cystoliths small, dot-like, linear, or sometimes wanting. Stipules free, or more or less connate. Flowers dioecious or sometimes monoecious. Panicles dichotomous, cymose or irregularly racemose. Staminate flowers with a 4- or 5-parted calyx; stamens 4 or 5; ovary rudimentary. Pistillate calyx of 4 nearly equal lobes, or the two outer small; stigma penicillate, persistent; ovule erect. Achene straight or oblique, enveloped in the succulent persistent perianth; pericarp thinly crustaceous; seed with little endosperm or none; cotyledons broad, flat. [Name unexplained, probably from *uro*, to burn, alluding to the stinging hairs.] About 40 species, natives of tropical America; Africa, the Mascarene Islands and Pacific Islands, the Porto Rico species known as *ORTIGA*. Type species: *Urtica baccifera* L.

Leaves coarsely dentate; fruit 3-5 mm. long.

Leaves crenate-dentate, fruit 1-1.5 mm. long.

Leaves broadly ovate to orbicular-ovate, usually cordate at the

base; flowers dioecious.

Leaves oblong-elliptic to ovate, usually rounded at the base;

flowers monoecious.

1. *U. baccifera*.

2. *U. caracasana*.

3. *U. chlorocarpa*.

1. **Urera baccifera** (L.) Gaud.; Wedd. Ann. Sc. Nat. II. 18: 199. 1852.

Urtica baccifera L. Sp. Pl. ed. 2, 1398. 1763.

A shrub 1.5-4 m. high, the stems usually armed with rather stout sharp, often helmet-shaped, brownish prickles 1.5-7 mm. long. Leaves oblong-ovate to round-ovate, 1-3.5 dm. long, 0.6-2.4 dm. broad, acute or acuminate at the apex, rounded and sometimes subcordate at the base, dentate to coarsely sinuate-dentate, glabrous or with sharp-pointed, often transparent, deciduous stinging

hairs above, usually armed on the veins beneath with rather stout straight or recurved stinging hairs; petioles 2–20 cm. long; cymes much-branched, the branches pinkish or pinkish red, often armed with numerous, slender sharp hairs; flowers dioecious; fruit white or rose-colored, 4–5 mm. long.

Woodlands and forests at lower and middle elevations, Porto Rico; St. Thomas;—Cuba; Jamaica; Hispaniola; St. Vincent; Grenada; Tobago; Trinidad; Central and South America. The plant is painfully stinging.

2. **Ureia caracasana** (Jacq.) Gaud.; Griseb. Fl. Br. W. 1. 154. 1859.

Urtica caracasana Jacq. Hort. Schoenb. 3: 71. 1798.

A shrub sometimes 6 m. high, the young twigs armed with sharp slender stinging hairs. Leaves ovate to orbicular-ovate, acuminate at the apex, usually cordate at the base with a broad open sinus, crenate-dentate, scabrous above, more or less soft pubescent beneath especially when young and with slender stinging hairs on the veins; petioles 2.5–14 cm. long, pubescent, often armed with scattered stinging hairs when young; cymes regularly dichotomous; flowers dioecious or sometimes monoecious; fruit vermilion-colored when ripe, 1–1.5 mm. long, 0.8–1 mm. broad.

Primeval forest, Sierra de Naguabo;—Jamaica; Guadeloupe; Martinique; St. Lucia; St. Vincent; Trinidad; continental tropical America.

3. **Ureia chlorocarpa** Urban, Symb. Ant. 1: 293. 1899.

A shrub 2–4 m. high, the older branches brown, often glabrous or nearly so, the twigs more or less appressed pilose, usually with sharp scattered transparent hairs intermixed. Leaves oblong-elliptic to ovate or oval, 7–23 cm. long, 3.5–12 cm. broad, acute or acuminate at the apex, rounded at the base, crenate-dentate, glabrous or with scattered hairs above, soft pubescent beneath when young and with sharp scattered transparent hairs on the veins; petioles 2–13 cm. long; cymes dichotomous, 1.5–2.5 cm. long; flowers monoecious, the staminate short-petioled; fruit short-ovoid or obliquely ovoid, 1–1.5 mm. long, 1 mm. broad.

Primeval forests near Adjuntas and on the Sierra de Naguabo. Endemic.

Ureia elata (Sw.) Griseb., a species apparently endemic in Jamaica, has been recorded from St. Croix by Grisebach and by Eggers; it is not known to exist there now.

2. **FLEURYA** Gaud. Bot. Voy. Freyc. 497. 1830.

Annual herbs, mostly with stinging hairs, alternate petioled dentate leaves, and minute clustered monoecious or dioecious flowers. Staminate flowers with a 4–5-parted perianth, 4 or 5 stamens and a rudimentary ovary. Pistillate flowers with 4, more or less unequal, imbricated perianth-segments, a somewhat oblique ovary, the stigma papillose; ovule erect. Fruit an oblique achene. [Commemorates J. F. Fleury, French botanist.] About 8 species, of tropical regions. Type species: *Fleurya paniculata* Gaud.

1. **Fleurya aestuans** (L.) Gaud.; Griseb. Fl. Br. W. 1. 154. 1859.

Urtica aestuans L. Sp. Pl. ed. 2, 1397. 1763.

Urtica latifolia Rich. Act. Soc. Hist. Nat. Paris 1: 113. 1792.

Erect or ascending, simple or little-branched, 3–12 dm. high, the stinging hairs copious or few. Leaves thin, ovate or ovate-orbicular, 7–17 cm. long, 2.5–12 cm. broad, coarsely and sharply dentate, acute or acuminate at the apex, rounded or subcordate at the base, the petioles 1–12 cm. long; panicles androgyn-

ous, shorter than or equalling the leaves, slender-peduncled; achene ovate, compressed, 1.2–1.6 mm. long.

On rocks, walls and waste grounds, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola.—Bahamas to Trinidad; continental tropical America; also recorded from the Old World tropics. PICA-PICA. WEST INDIAN NETTLE.

3. *PILEA* Lindl. Coll. pl. 4. 1821.

Annual or perennial herbs, sometimes shrubby at the base, with opposite petioled mostly 3-nerved leaves, connate stipules, and small monoecious or dioecious flowers in axillary cymose or glomerate clusters. Staminate flowers mostly 4-parted (sometimes 2- or 3-parted); stamens as many as the perianth-segments, the ovary rudimentary. Pistillate flowers 3-parted, the segments in most species unequal, each subtending a staminodium in the form of a concave scale; ovary straight; stigma sessile, penicillate. Achene compressed, smooth or scabridulous, more or less incompletely enveloped by the persistent perianth-segments. Seed-coat thin; endosperm scanty or none; cotyledons broad. [Latin, a felt cap, from the shape of the larger sepal of the fertile flower which in some species partly covers the achene.] About 190 species, chiefly in the tropics, most abundant in tropical America. Type species: *Pilea muscosa* Lindl.

Leaves entire.

Leaves 1-nerved or faintly pinnately veined; cystoliths of the upper surface linear, conspicuous.

Stem erect or diffuse; species of dry situations.

Herbaceous slender species.

Leaves fleshy.

Leaves membranous.

Bushy, very fleshy.

Stems creeping in wet situations.

Leaves 3-nerved; cystoliths minute, inconspicuous.

Diminutive species with rhombic leaves 3–7 mm. long, 3–5 mm. broad.

Tall species with ovate much larger leaves.

Sparingly pubescent or glabrate; stipules triangular, caducous.

Pilose; stipules semi-amplexicaul, persistent.

Leaves dentate, crenate or incised.

Leaves pinnately veined.

Leaves 3–5-nerved at or a little above the base.

Inflorescence short, about as long as the petioles or shorter; creeping species; leaves orbicular.

Inflorescence longer than the petioles, often as long as the leaves.

Leaves orbicular, coarsely crenate, 3 cm. long or less; stem creeping.

Leaves ovate, elliptic, lanceolate or linear.

Leaves acute or obtuse, crenate or dentate.

Plants low, slender, creeping; leaves 0.8–5 cm

long.

Plants tall, stout; leaves larger.

Leaves cuncate at the base.

Leaves rounded or subcordate at the base.

Leaf-margin crenate-dentate.

Leaf-margin double toothed.

Leaves long-acuminate.

Both staminate and pistillate inflorescence

paniculate.

Staminate inflorescence capitate, pistillate

paniculate.

1. *P. microphylla*.

2. *P. tenerima*.

3. *P. Margaretae*.

4. *P. herniarioides*.

5. *P. multicaulis*.

6. *P. Parietaria*.

7. *P. yunquensis*.

8. *P. Krugii*.

9. *P. nummulariaefolia*.

10. *P. repens*.

11. *P. inaequalis*.

12. *P. Richardi*.

13. *P. obtusata*.

14. *P. sanctae-crucis*.

15. *P. leptophylla*.

16. *P. semidentata*.

1. *Pilea microphylla* (L.) Liebm. Vid. Selsk. Skr. V. 2: 296. 1851.

Parietaria microphylla L. Syst. ed. 10, 1308. 1759.

Pilea microphylla trianthemoides Griseb. Fl. Br. W. 1. 155. 1859.

Adicea microphylla Kuntze, Rev. Gen. Pl. 622. 1891.

Adicea microphylla trianthemoides Kuntze, Rev. Gen. Pl. 622. 1891.

Glabrous, dioecious or monoecious, the fleshy stems erect or ascending or sometimes creeping at the base, 2–20 cm. high. Leaves of a pair often unequal, the blades small, often crowded, obovate, oblanceolate or elliptic, 1.5–10 mm. long, 0.7–6 mm. broad, occasionally larger, acute or acutish at the apex, acute at the base, 1-nerved, entire, the cystoliths linear, prominent above, the petioles filiform, shorter than the blades; flower-clusters very small, usually sessile, shorter than the leaves; sepals ovate, very thin, acutish; achene oblong, lenticular. [*Urtica portulacina* of Krebs.]

Moist banks, rocks and walls at lower and middle elevations, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola; Anegada:—Florida; Bermuda; West Indies; tropical America. Consists of several races, some of them commonly planted for ornament. MADRE SELVA. GALE OF WIND. ARTILLERY PLANT. VERDOLAGUILLA.

2. *Pilea tenerrima* Miquel, *Linnaea* **26**: 219. 1854.

Stems very slender or nearly filiform, usually tufted, prostrate or nearly so, slightly fleshy, 3–10 cm. long, more or less branched. Leaf-blades suborbicular or obovate, 3–6 mm. long, rounded or obtuse at the apex, obliquely narrowed or obtuse at the base, 1-nerved, usually thin and flaccid, glabrous, entire, the slender petioles 2–5 mm. long; flowers and achenes similar to those of the preceding species of which it is, perhaps, a slender, small-leaved race. [*Urtica serpyllacea* of Krebs.]

Banks and wells at lower elevations in dry districts of Porto Rico; Mona; St. Jan; St. Thomas; Tortola; Anegada:—Bahamas; Florida; Cuba; Jamaica; Curaçao; South America.

3. *Pilea Margarettae* Britton, sp. nov.

? *Pilea microphylla succulenta* Griseb. *Fl. Br. W. I.* 155. 1859.

A low glabrous bushy fleshy herb, the stems erect or ascending. Leaves of a pair unequal, the blades broadly oval to orbicular, 2–6 mm. long, 1.8–6 mm. broad, thick, firm in texture, rounded at the apex, acutish or rounded at the base, 1-nerved, entire, the cystoliths linear, prominent above, the petioles filiform, 1.5 mm. long or less; flower clusters often shorter than the petioles, sessile or short-peduncled.

Limestone rocks and cliffs, Porto Rico; Mona; Anegada:—Cuba; Jamaica. Type from rock crevices, top of a limestone hill near Coamo Springs, Porto Rico (*N. L. Britton, E. G. Britton and Margaret S. Brown, Mar. 14, 1922*).

4. *Pilea herniarioides* (Sw.) Lindl. *Coll. Bot. under pl. 4.* 1821.

Urtica herniarioides Sw. *Vet. Akad. Handl. Stockh.* **8**: 65. 1787.

Pilea deltooides Liebm. *Vid. Selsk. Skr. V.* **2**: 298. 1851.

Pilea microphylla herniarioides Wedd. in *DC. Prodr.* **16**: 106, in part. 1869.

Adicca microphylla herniarioides Kuntze, *Rev. Gen. Pl.* 622. 1891.

Stems filiform, short, little branched, usually prostrate or creeping, often rooting at the nodes. Leaves of a pair nearly equal, the blades minute, broadly ovate, deltoid or suborbicular, 1–3 mm. long and broad, glabrous or with few long hairs on the upper surface and margin; petioles about 1 mm. long; inflorescence usually sessile in the upper axils or among the terminal leaves; pedicels of the staminate flowers up to 2 mm. long, the perianth 1.2–1.5 mm. long, the pistillate perianth smaller; achene ovate-elliptic, 0.6–0.7 mm. long, more or less muriculate, the margins somewhat transparent.

Bank of stream, La Juanita near Las Marias, and base of cliff above Corozal, Porto Rico; St. Croix (according to Fawcett & Rendle); Virgin Gorda:—Cuba; Hispaniola; Jamaica; also recorded from Guadeloupe, Martinique and Costa Rica.

5. *Pilea multicaulis* Urban, *Symb. Ant.* **1**: 295. 1899.

A small glabrous suffrutescent monoecious herb, the stems erect or ascending. Leaves of a pair often unequal, the blades ovate to orbicular, 3–7 mm. long, 3–5

mm. broad, obtuse at the apex, obtuse or rounded at the base, 3-nerved, the margin entire; cystoliths minute, rather prominent above, inconspicuous beneath; petioles very slender, 2-6 mm. long; stipules semiorbicular, 0.4-0.7 mm. long; inflorescence glomerate, the pistillate sessile or short-peduncled, the staminate with a peduncle up to 4 mm. long; achenes ovate, 0.5 mm. long.

Eastern Porto Rico, collected only by Schwanecke. Endemic.

6. *Pilea Parietaria* (L.) Blume, Mus. Bot. Lugd. Bot. 2: 48. 1856.

Urtica Parietaria L. Sp. Pl. ed. 2, 985. 1753.

Urtica ciliaris L. Syst. ed. 10, 1266. 1759.

Pilea ciliaris Wedd. Ann. Sci. Nat. III. 18: 209. 1852.

Pilea Wydleri Blume, Mus. Bot. Lugd. Bot. 2: 49. 1856.

Pilea ciliaris Rivoriae Wedd. in DC. Prodr. 16¹: 114. 1869.

Pilea ciliaris Wydleri Wedd. in DC. Prodr. 16¹: 115. 1869.

Adicea ciliaris Kuntze, Rev. Gen. Pl. 622. 1891.

Pilea Parietaria Wydleri Urban, Symb. Ant. 4: 201. 1905.

Monoecious, suffrutescent, with glabrous ascending stems up to 3 dm. or higher. Leaves of a pair often somewhat unequal, the blades membranous, narrowly ovate to broadly ovate, 2.5-9 cm. long, 1-4.3 cm. broad, acute or acuminate at the apex, obtuse or rounded and occasionally somewhat subcordate at the base, 3-nerved, often pilose above with scattered pellucid hairs, usually pilose on the veins beneath, the margin entire, ciliate, the cystoliths small and inconspicuous above, usually prominent beneath; petioles 3-5.5 cm. long; glabrous or sparingly pilose; stipules triangular, caducous, 1-2 mm. long, brown; cymes 1 or 2 in the axils, the peduncles often longer than the petioles; achenes ovate-elliptic, 0.6-0.7 mm. long, smooth.

Moist shaded situations, banks and forests, Porto Rico, ascending to higher elevations:—Cuba; Jamaica; Hispaniola; Saba to Grenada.

7. *Pilea yunquensis* (Urban) Britton & Wilson, sp. nov.

Pilea Parietaria yunquensis Urban, Symb. Ant. 1: 295. 1899.

Pilea Parietaria yunquensis brevinodis Urban, Symb. Ant. 1: 295. 1899.

Suffrutescent, the stems erect or ascending, 1-2 dm. or higher, densely pilose. Leaves of a pair somewhat unequal, the blades ovate, 3.5-8 cm. long, 2.5-5 cm. broad, acute or acuminate at the apex, rounded and often somewhat inequilateral at the base, 3-nerved, membranous, pilose on both sides with pellucid hairs, the margin entire, ciliate; cystoliths small, rather inconspicuous; petioles 1.5-4 cm. long, pilose; stipules semi-amplexicaul, persistent, white, 2.5-3 mm. long; achene ovate, smooth.

Forests of the eastern mountains of Porto Rico at higher elevations. Endemic.

8. *Pilea Krugii* Urban, Symb. Ant. 1: 298. 1899.

Glabrous, monoecious, the rootstocks up to 8 dm. long, creeping among mosses on tree trunks and over rocks, the stems erect or ascending, 1.5-3 dm. high. Leaves of each pair usually very unequal, the blades membranous, pinnately veined, serrate, the cystoliths linear; larger leaf-blades elliptic-lanceolate, lanceolate or obovate-elliptic, 5-12 cm. long, 1.5-4 cm. broad, acuminate to long-acuminate at the apex, acute or obtuse and often inequilateral at the base, the petioles 0.5-1.5 cm. long, the smaller blades lanceolate, elliptic or broadly obovate, 0.7-5 cm. long, the petioles 0.5-6 mm. long; stipules caducous; inflorescence capitate, many-flowered, axillary, sessile or short-peduncled; shorter or slightly longer than the petioles; achenes ovate, 1.3 mm. long.

Mountain forests of Porto Rico. Endemic.

9. *Pilea nummulariaefolia* (Sw.) Wedd. Ann. Sci. Nat. III. 18: 225. 1852.

Urtica nummulariaefolia Sw. Vet. Acad. Handl. Stockh. 8: 63. 1787.

Adicea nummulariaefolia Kuntze, Rev. Gen. Pl. 623. 1891.

Urtica rotundifolia Sessé & Moç. Fl. Mex. ed. 2, 214. 1894. Not Savigny 1797.

Stem elongated, creeping, rooting at the nodes, pilose, the branches erect or ascending. Leaves of each pair about the same size and form, broadly oval to orbicular, 5–20 mm. long, occasionally truncate at the base, 3-nerved, hispid on both sides with transparent hairs, crenate, the cystoliths linear; petioles 3–15 mm. long, pilose; stipules oval to round-oval, 1.5–2.5 mm. long; staminate inflorescence about half as long as the leaves, the calyx-lobes elliptic, 2–2.3 mm. long, 1–1.2 mm. broad, pilose, the pedicels 3–4 mm. long; pistillate inflorescence axillary or terminal, equalling or shorter than the petioles, the flowers subsessile or pedicellate; achenes ovoid, 0.5–0.6 mm. long.

On shaded banks and rocks and in forests, Porto Rico; Vieques; St. Thomas; St. Croix;—Bermuda; Cuba; Jamaica; Hispaniola. Sometimes planted for ornament. YERBA DE CULEBRA. CREEPING CHARLEY.

10. *Pilea repens* (Sw.) Wedd. Ann. Sci. Nat. III. 18: 220. 1852.

Urtica repens Sw. Vet. Acad. Handl. Stockh. 8: 61. 1787.

Adicea repens Kuntze, Rev. Gen. Pl. 622. 1891.

Stems creeping, often rooting at the nodes, the branches erect or ascending, pilose. Leaves of a pair often unequal, the blades ovate to suborbicular, occasionally somewhat obovate, 0.8–3.5 cm. long, 0.7–3 cm. broad, rounded or obtuse at the apex, rounded at the base, 3-nerved, glabrous or pilose with few scattered pellucid hairs above, often sparingly pilose on the veins beneath, the margin crenate or crenate-serrate; cystoliths linear, prominent on both surfaces; petioles slender, 0.5–2.5 cm. long; inflorescence long-peduncled, sometimes longer than the leaves; achene ovate, 0.7–0.8 mm. long, 0.5 mm. broad.

Shaded rocky situations at lower elevations in moist districts, Porto Rico;—Cuba; Hispaniola; Guadeloupe.

11. *Pilea inaequalis* (Juss.) Wedd. Ann. Sci. Nat. III. 18: 229. 1852.

Urtica inaequalis Juss.; Poir, in Lam. Encyc. Suppl. 4: 222. 1816.

Urtica collina Bertero; Spreng. Syst. 3: 839. 1826.

Pilea chamaedrys Wedd. Ann. Sci. Nat. III. 18: 229. 1852.

Adicea chamaedrys Kuntze, Rev. Gen. Pl. 622. 1891.

Adicea inaequalis Kuntze, Rev. Gen. Pl. 622. 1891.

Stems erect or ascending, mostly less than 1.5 dm. high, pubescent, the rootstocks slender. Leaves of each pair usually unequal, the blades ovate to oval, occasionally obovate, 0.8–5 cm. long, 0.5–3 cm. broad, obtuse or rounded at the apex, acute or rounded at the base, glabrous or nearly so on both sides, the margin coarsely crenate-serrate to the middle or below, the cystoliths linear; petioles 3–18 mm. long, pubescent; stipules ovate to orbicular, 2 mm. long; inflorescence in the axils of the upper leaves, the peduncles often as long as the leaves, the flowers short-pedicelled or subsessile; achenes oval to round-oval, about 1 mm. long.

Moist hillsides and forests of Porto Rico, ascending to higher elevations; St. Thomas;—Jamaica; also recorded from the Lesser Antilles.

12. *Pilea Richardi* Urban, Symb. Ant. 5: 319. 1907.

Diocious, perennial, the stems solitary, erect, sparingly short-pilose. Leaves of a pair subequal, the blades membranous, obovate or oval-elliptic, 6–9 cm. long, 3.5–4 cm. broad, obtuse at the apex, cuneate at the base, sparingly pilose above, glabrous beneath, 3-nerved above the base, the margin dentate-

serrate, short-ciliate, the cystoliths linear; petioles 1-2 cm. long, short-pilose; stipules suborbicular, subtruncate at the apex, brown; pistillate inflorescence as long as the leaves, the peduncles 3-4 mm. thick, the heads 6-15-flowered; flowers sessile or subsessile, the lobes unequal; achene short-ovate or obliquely-ovate, 0.9 mm. long, brown, not muriculate.

St. Thomas, collected by L. C. Richard, according to Urban. Known to us only from the description. Endemic.

13. ***Pilea obtusata*** Liebm. Vid. Selsk. Skr. V. 2: 300. 1851.

Pilea montana Wedd. Ann. Sci. Nat. III. 18: 228. 1852.

Pilea pubescens Griseb. Fl. Br. W.I. 159. 1859. Not Liebm.

Pilea pubescens montana Wedd. in DC. Prodr. 16: 153. 1869.

Adicca obtusata Kuntze, Rev. Gen. Pl. 623. 1891.

Stems erect, 1-3 dm. or higher, pilose. Leaves of each pair more or less unequal, the blades broadly ovate, 3-9.5 cm. long, 2-7 cm. broad, obtuse or acutish at the apex, rounded or obtuse and often subcordate at the base, 3-nerved, glabrous or pilose above, pilose beneath especially on the veins, the margin coarsely crenate-dentate, the cystoliths linear; petioles 0.5-4 cm. long; stipules broadly ovate or orbicular, 2-3 mm. long; cymes long-peduncled; staminate flowers subsessile, the perianth 1.5 mm. long; pistillate flowers sessile or subsessile; achene elliptic-ovate or ovate, 0.7-0.8 mm. long, 0.4-0.5 mm. broad, minutely muriculate.

Forests, wooded valleys and ravines; in moist or wet districts, Porto Rico, ascending to the higher elevations:—Montserrat; Martinique; erroneously recorded from Jamaica.

14. ***Pilea sanctae-crucis*** Liebm. Vid. Selsk. Skr. V. 2: 301. 1851.

Adicca sanctae-crucis Kuntze, Rev. Gen. Pl. 623. 1891.

Dioecious or rarely monoecious, the stems erect. Leaves of each pair subequal, the blades membranous, or chartaceous, ovate or ovate-elliptic, 3-9 cm. long, 2.5-7 cm. broad, acute or short-acuminate at the apex, rounded and often subcordate at the base, glabrous or sparingly pilose above, pilose on the nerves beneath, 3-5-nerved a little above the base, the margin doubly toothed, the cystoliths linear; petioles 1-4 cm. long; stipules orbicular or obovate-orbicular, 4-7 mm. long; persistent; inflorescence long-peduncled, paniculate, many-headed, or the staminate sometimes raceme-like and few-headed; achene ovate, 7-9 mm. long. [*Pilea grandis* and *P. semidentata* of Eggers, not Wedd.; ? *Urtica betulifolia* of Krebs.]

Sierra de Luquillo (according to Urban); banks and forests, St. Thomas; St. Croix; St. Jan; Tortola. Endemic.

15. ***Pilea leptophylla*** Urban, Symb. Ant. 1: 297. 1899.

Stems erect, glabrous. Leaves of a pair equal or nearly so, the blades membranous, ovate or ovate-elliptic, 8-15 cm. long, 5-7 cm. broad, acuminate to long-acuminate at the apex, rounded or subcordate at the base, 5-nerved, pilose when young, the margins dentate or undulate-crenate, short-ciliate, the cystoliths linear; petioles 0.5-1.5 cm. long; stipules ovate, 7-8 mm. long, brown; inflorescence long-peduncled, often longer than the leaves, its branches spreading; staminate flowers with pedicels 1-2 mm. long, the perianth-lobes triangular; pistillate flowers subsessile; achene short-ovate, 0.7 mm. long.

Cerro de Pandura, Sierra de Yabucoa. Endemic.

16. ***Pilea semidentata*** (Juss.) Wedd. Ann. Sci. Nat. III. 18: 215. 1852.

Urtica semidentata Juss.; Poir, in Lam. Encyc. Suppl. 4: 222. 1816.

Pilea elegans Wedd. Ann. Sci. Nat. III. 18: 215. 1852.

Pilea portoricensis Wedd. in DC. Prodr. 16: 143. 1869.

- Pilea elegans latifolia* Wedd. in DC. Prodr. **16**: 141. 1869.
Pilea elegans minor Wedd. loc. cit. 141. 1869.
Pilea semidentata major Wedd. in DC. Prodr. **16**: 142. 1869.
Adicea elegans Kuntze, Rev. Gen. Pl. 622. 1891.
Adicea semidentata Kuntze, Rev. Pl. Gen. **2**: 623. 1891.
Urtica capitata Sessé & Moç. Fl. Mex. ed. 2, 214. 1894. Not L.
Pilea semidentata minor Urban, Symb. Ant. **1**: 297. 1899.
Pilea semidentata nana Urban, Symb. Ant. **1**: 297. 1899.

Stems erect, 1–4 dm. or more high, glabrous. Leaves of a pair equal or sometimes unequal; blades various, narrowly oblong, oblong-lanceolate, oblong-ovate, lanceolate or ovate, 2–16 cm. long, 0.5–6 cm. broad, acuminate at the apex, narrowing at the base into the petiole or rarely rounded, 3–5-nerved, glabrous on both sides, the margin serrate, denticulate, or incised-serrate, the cystoliths linear; petioles 0.6–5 cm. long; stipules elliptic to oval or ovate, 0.6–1.6 cm. long, persistent; inflorescence long-peduncled, often longer than the leaves, the staminate capitate, the pistillate with spreading branches; achene narrowly ovate, 0.8–0.9 mm. long, 0.5 mm. broad.

Shaded banks and cliffs and forests at middle and higher elevations in wet or moist districts, Porto Rico; Hispaniola; Saba; St. Eustatius; St. Kitts; Guadeloupe; Dominica; Martinique. The species consists of many races, with leaves differing in size and shape. *Pilea portoricensis* Wedd., the broadest-leaved race, inhabits banks at about 600 m. altitude, between Guayama and Cayey.

Pilea grandifolia (L.) Blume [*Pilea grandis* Wedd.], recorded by Weddell (DC. Prodr. **16**: 143) as from Jamaica and St. Thomas, is confined to Jamaica, where there is a parish of St. Thomas.

Pilea ciliata (Sw.) Blume, recorded by Krebs from St. Thomas, is also endemic in Jamaica [*Urtica ciliata* Sw.].

4. **BOEHMERIA** Jacq. Enum. 9, 31. 1760.

Perennial herbs, shrubs or sometimes small trees, without stinging hairs. Leaves opposite or alternate, often long-petioled, toothed, 3-nerved. Stipules generally free or joined only at the base, deciduous. Flowers small, monoecious or dioecious, in globose clusters, the clusters generally unisexual, sessile in the axils or at the nodes or along the rachis of a spike. Staminate flowers 4-parted (rarely 3- or 5-parted) or the calyx of 4 distinct sepals; stamens as many as the calyx-lobes or sepals; ovary rudimentary. Pistillate calyx tubular or urn-shaped, 2–4-toothed or entire. Ovary enveloped by the perianth, sessile or stalked; ovule erect; stigma subulate, papillose or hairy along one side, persistent in fruit. Achene enclosed by the withering-persistent pistillate calyx. Seeds small; testa thin; cotyledons elliptic or ovate. [In honor of Georg Rudolph Boehmer, 1723–1803, professor in Wittenberg.] About 50 species, mostly of warm regions. Type species: *Boehmeria ramiflora* Jacq.

Inflorescence elongate, glomerate-spicate; plant erect.
 Inflorescence of small axillary clusters; plant trailing.

1. *B. cylindrica*.
2. *B. repens*.

1. *Boehmeria cylindrica* (L.) Sw. Prodr. 34. 1788.

- Urtica cylindrica* L. Sp. Pl. 984. 1753.
Boehmeria littoralis Sw. Prodr. 34. 1788.
Boehmeria cylindrica brachystachys Wedd. in DC. Prodr. **16**: 202. 1869.
Ramium cylindricum Kuntze, Rev. Gen. Pl. 632. 1891.

Perennial, erect, 2–10 dm. tall, the stem simple or branched, pubescent or nearly glabrous. Leaves opposite or alternate, narrowly lanceolate to lanceolate

or ovate-lanceolate, 5–17 cm. long, 1–7 cm. broad, acuminate at the apex, rounded, acutish or occasionally subcordate at the base, coarsely dentate, often more or less pubescent, especially beneath, petioled; flower-clusters sessile, dense, forming elongated interrupted spikes on slender branches; achene suborbicular, 1–1.2 mm. broad, pointed, often oblique at the base.

Wet or moist soil at lower and middle elevations, Porto Rico:—Bermuda; Cuba; Jamaica; Hispaniola; Trinidad; continental America.

2. **Boehmeria repens** (Griseb.) Wedd. in DC. Prodr. 16¹: 201. 1869.

Pouzolzia repens Griseb. Mem. Am. Acad. II. 8: 174. 1860.

Pilea Swartzii Griseb. loc. cit. 174. 1860. Not Wedd. 1852.

Boehmeria repens major Wedd. loc. cit. 201. 1869.

Ramium repens Kuntze, Rev. Gen. Pl. 633. 1891.

Stems slender, trailing, 2–8 dm. long, pubescent. Leaves ovate, 0.8–4.5 cm. long, 0.6–2.5 cm. broad, those of a pair usually very unequal, acute or acuminate at the apex, rounded or acutish at the base, more or less pubescent on both surfaces with long stiff hairs, petioled, dentate; flower-clusters small, axillary; achenes ovate, 1.5–2 mm. long, 1.2 mm. broad, pointed.

Moist forests, Porto Rico:—Cuba; Hispaniola.

Boehmeria nivea (L.) Gaud., RAMIE, a native of tropical Asia, has been cultivated in Porto Rico for its fiber. It is a shrubby perennial, about 1 m. high, with alternate ovate serrate leaves up to 2 dm. long, white-tomentulose beneath. [*Urtica nivea* L.]

Boehmeria macrophylla (Thunb.) Sieb. & Zucc., a Japanese species, was recorded by Krebs as found in St. Thomas, apparently in error. [*Urtica macrophylla* Thunb.]

5. **POUZOLZIA** Gaud. Bot. Voy. Freyc. 503. 1830.

Herbs or shrubs, with alternate, rarely opposite, usually entire, 3-nerved, petioled leaves. Flowers monoecious, rarely dioecious, in axillary clusters. Staminate flowers with a 4- or 5-lobed or 4- or 5-parted (rarely 3-parted) calyx; stamens as many as the calyx-lobes; ovary rudimentary. Pistillate calyx tubular, 2–4-toothed; ovary completely enclosed by the perianth; stigma usually linear or filiform, hairy on one side, not persistent in fruit; ovule erect. Achene enclosed by the withering-persistent pistillate calyx. Seed small; testa thin; endosperm scant or none; cotyledons ovate. [Named in honor of Pierre Casimir Marie de Pouzolz, 1785–1858.] About 60 species, natives of tropical regions. Type species: *Parietaria laevigata* Poir.

1. **Pouzolzia occidentalis** (Liebm.) Wedd. Arch. Mus. Paris 8: 410. 1856.

Leucococcus occidentalis Liebm. Vid. Selsk. Skr. V. 2: 311. 1851.

A shrub 3 m. or higher, with pubescent twigs. Leaves membranous, elliptic to ovate, 5–14 cm. long, 2.5–7 cm. broad, acuminate at the apex, cuneate or rounded at the base; pubescent above with stiff scattered hairs, softly pubescent beneath at least when young; stipules lanceolate, acuminate, pilose; heads few-flowered; staminate flowers sessile or short-pedicelled, the lobes pubescent; pistillate calyx pubescent; stigma deciduous; achene ovate.

Valley of the Coamo River at El Tendal, Porto Rico; Vieques:—Central and South America.

6. **ROUSSELIA** Gaud. Bot. Voy. Freyc. 503. 1830.

A low diffuse perennial herb, without stinging hairs, the leaves alternate, entire, the small axillary flowers monoecious. Staminate flowers in small racemes, the calyx 4-parted, the stamens 4, the ovary rudimentary. Pistillate flowers geminate, 2-bracted, sessile, the bracts foliaceous; calyx ovoid, dentate; ovary straight; style filiform, curved, plumose on one side. Achene flat, ovate, acute, surrounded by the bracts. Seed with a membranous testa and scanty endosperm. [Commemorates H. F. A. de Roussel, professor at Caen.] A monotypic genus.

1. **Rousselia humilis** (Sw.) Urban, Symb. Ant. 4: 205. 1905.

Urtica humilis Sw. Vet. Akad. Handl. Stockh. 6: 34. 1785.

Urtica lappulacea Sw. loc. cit. 8: 69. 1787.

Rousselia lappulacea Gaud. Bot. Voy. Freyc. 503. 1830.

Pubescent; stems slender, branched, prostrate or ascending, 1-4 dm. long. Leaves ovate to elliptic or oval, membranous, 3-nerved, 0.5-4 cm. long, 0.4-3.5 cm. broad, acute to acuminate or obtuse at the apex, rounded or acutish at the base; stipules minute; bracts of the pistillate flowers ovate, 3-4 mm. long, entire; achene shining, about 1.5 mm. long.

Shaded rocky places at lower elevations, Porto Rico; St. Thomas;—Bahamas; Cuba; Jamaica; Hispaniola; Saba; Dominica.

Pellionia Daveauana N. E. Brown, East Indian, well established at Louisenhöj, St. Thomas, in 1923, is a prostrate spreading, somewhat fleshy perennial, with sessile lanceolate-oblong variegated leaves about 6 cm. long, their bases obliquely cordate.

Urtica elongata Vahl (St. Croix, according to West) is a species unknown to modern botanists.

Grevillea robusta CUMM., SILK OAK, Australian, of the large family **Proteaceae**, order **Proteales**, planted for ornament and shade in Porto Rico and the Virgin Islands, is a fine tree, reaching a height of 15 m. or more, with 2-pinnately parted leaves up to 3 dm. long, the ultimate linear-oblong segments small, acute; its flowers are borne in paniced racemes, with oval sepals and a long style; the fruits are recurved oblique follicles about 15 mm. long, tipped by the slender bent style.

Macadamia ternifolia F. Muell., of Queensland, West Australia, also of the **Proteaceae**, experimentally planted at the Forest Station, Rio Piedras and growing well in 1923, is a tree with verticillate, oblong-lanceolate, entire shining leaves 1-3 dm. long, the nearly regular white flowers in racemes, the fruit globose, leathery, the pericarp 2-valved.

Order 7. **SANTALALES.**

Trees, shrubs or herbs, many of them parasitic on the roots or branches of other plants, with simple, mostly entire leaves, sometimes reduced to scales. Flowers perfect or imperfect, inconspicuous, the corolla present or wanting. Stamens as many or twice as many as the sepals or petals. Fruit various. Seeds mostly with fleshy endosperm.

Plants not parasitic; flowers perfect.

Parasitic plants; flowers monoecious or dioecious.

Parasitic shrubs containing chlorophyll; leaves opposite, in some species reduced to scales, or alternate; flowers borne in axillary or terminal spikes, racemes or panicles, or solitary.

Fleshy root-parasites without leaves or chlorophyll; flowers crowded on spadix-like peduncled heads or cones.

Fam. 1. OLACACEAE.

Fam. 2. LORANTHACEAE.

Fam. 3. BALANOPHORACEAE.

Family 1. OLACACEAE Lindl.

OLAX FAMILY.

Shrubs, trees or woody vines, mostly with alternate and entire, pinnately veined, estipulate leaves, and regular, perfect or polygamous flowers in axillary clusters. Calyx 4-6-toothed or 4-6-parted. Corolla 4-6-lobed or of 4-6 distinct petals. Disk various. Stamens 4-12; filaments distinct or rarely monadelphous; anthers 2-celled. Ovary 1-3-celled, inferior, half-superior, or partly immersed in the disk; ovules few, anatropous; style short, usually simple; stigma entire or 2-5-lobed. Fruit drupaceous, 1-celled. Testa of the seed membranous; endosperm fleshy, or rarely wanting. About 25 genera and 140 species, mostly tropical.

1. *SCHOEPFIA* Schreb.; Gmel. Syst. 376. 1791.

Glabrous trees or shrubs, with coriaceous entire leaves and small perfect flowers in axillary cymes. Calyx very small, 4-toothed. Petals united to above the middle, forming a tubular or urceolate, 4-6-lobed corolla, the lobes valvate, recurved. Stamens as many as the corolla-lobes and opposite them; filaments filiform or short; anthers didymous. Ovary sessile, 3-celled, partly immersed in the disk; style slender or short; stigma capitate or 3-lobed; ovules usually 1 in each cavity. Fruit a small drupe nearly enclosed by the accrescent disk. [Commemorates J. D. Schoepf, 1752-1800, a German botanist.] About 15 species, of tropical and subtropical America and Asia. Type species: *Schoepfia Schreberi* Gmel.

Fruit 6-10 mm. long, 4.5-6 mm. in diameter.

Leaves obovate, occasionally oblong or elliptic, rounded or obtuse, 2-4 cm. long, 0.8-2.5 cm. broad.

Leaves lanceolate-ovate to ovate, acuminate, frequently folded-falcate, 4-7.5 cm. long, 1.8-4.8 cm. broad.

Fruit 1.6-1.8 cm. long, 1 cm. in diameter; leaves ovate, obtuse or acutish.

1. *S. obovata*.

2. *S. Schreberi*.

3. *S. arenaria*.

1. *Schoepfia obovata* C. Wright; Sauvalle, Anales Acad. Habana 5: 289. 1868.

A glabrous shrub 1-3 m. high, or sometimes a tree up to 10 m. high, the twigs slender, gray, the bark rough in narrow plates. Leaves obovate, occasionally oblong or elliptic, coriaceous, 2-4 cm. long, 0.8-2.5 cm. broad, rounded or obtuse at the apex, narrowed or cuneate at the base, few-veined, the petioles 1-3 mm. long; peduncles solitary or few together in the axils, 2-8 mm. long, 1-3-flowered; flowers sessile; corolla 4-5 mm. long, red to greenish yellow, the lobes ovate or triangular-ovate; fruit globose-obovoid to ellipsoid, 6-8 mm. long, 4.5-5 mm. in diameter, yellow or red when mature.

Coastal thickets and woodlands at lower and middle elevations in relatively dry districts, Porto Rico; Anegada:—Bahamas; Cuba; Hispaniola.

2. *Schoepfia Schreberi* Gmel. Syst. 376. 1791.

Codonium arborescens Vahl, Skr. Nat. Selsk. 2: 207. 1792.

Schoepfia arborescens R. & S. Syst. 5: 160. 1819.

A shrub or small tree. Leaves lanceolate-ovate to ovate, coriaceous, 4-7.5 cm. long, 1.8-4.8 cm. broad, obtusely acuminate at the apex, rounded or some-

what acutish at the base, frequently folded-falcate, rather indistinctly veined, short-petioled; peduncles solitary or several in the axils, 1-3-flowered; flowers sessile; corolla 4-4.5 mm. long, the lobes triangular-ovate; fruit obovoid or ellipsoid, 8-10 mm. long, 5-6.5 mm. in diameter, black.

Woodlands, Vieques; St. Thomas; St. Croix:—Antigua to Trinidad; recorded from continental tropical America.

3. *Schoepfia arenaria* Urban & Britton; Urban, Symb. Ant. 5: 181. 1907.

A shrub with light gray branches. Leaves ovate, coriaceous, 3.5-6 cm. long, obtuse or somewhat acutish at the apex, rounded at the base, rather indistinctly pinnately nerved, the petioles 3-5 mm. long; peduncles 7-9 mm. long, 2-3-flowered; corolla 7 mm. long, cream-color; the lobes triangular-lanceolate; fruit 1.6-1.8 cm. long, 1 cm. in diameter, bright red.

Sandy coastal thicket, Santurce, Porto Rico. Endemic. Included at first by Urban in the preceding species. Recorded by Millspaugh as *Schoepfia didyma* C. Wright.

Ximenia americana L., a thorny shrub or small tree, widely distributed in the West Indies as a coastal species, has been recorded as occurring in Porto Rico by Britton and Millspaugh (Bahama Flora 112), but we are not now able to verify this range by reference to any specimen preserved; it grows on the coast of Santo Domingo.

Santalum album L., SANDAL-WOOD, East Indian, seedlings of which were seen at the St. Croix Agricultural Experiment Station in 1923, forms a beautiful small tree, its wood nearly white, fragrant, its thin, elliptic leaves about 7 cm. long, its small flowers in terminal panicles, white, turning purple.

Family 2. **LORANTHACEAE** D. Don.

MISTLETOE FAMILY.

Parasitic shrubs containing chlorophyll, growing on woody plants and absorbing food from their sap through specialized roots called haustoria (a few tropical species terrestrial). Branches terete or angled, often articulated at the nodes. Leaves opposite, in some species reduced to scales, or alternate. Flowers perfect, monoecious or dioecious, in axillary or terminal spikes, racemes or panicles, or solitary. Perianth of one or two series of parts. Calyx-tube adnate to the ovary. Stamens 2-6. Anthers 2-celled, the cells parallel, longitudinally dehiscing, or sometimes 1-celled, with the cells confluent and dehiscing by a transverse pore or chink. Disk present or sometimes wanting. Ovary solitary, 1-celled. Style simple or none. Stigma terminal. Fruit a berry. Embryo terete or angled. About 21 genera and 500 species, widely distributed; most abundant in tropical regions.

Perianth of two series of parts; flowers in axillary or terminal racemes, spikes or panicles, the calyx-tube enveloped by a cup-like, toothed bractlet.

Perianth of one series of parts; flowers in axillary or terminal spikes, more or less sunken in the rachis.

Leaves alternate; internodes continuous.

Leaves or scales opposite; internodes articulated.

Filaments adnate to the petals at the base, with a short free tip; anthers 2-celled.

Filaments wholly adnate to the petals, the anthers sessile, 1-celled > confluence.

1. *Phthirusa*.

2. *Iridium*.

3. *Phoradendron*.

4. *Dendrophthora*.

1. **PHTHIRUSA** Mart. Flora 13¹: 110. 1830.[*DENDROPEMON* Blume in R. & S. Syst. Veg. 7: 1729. 1830.]

Parasitic shrubs, with opposite, coriaceous or somewhat fleshy, mostly flat leaves. Flowers mostly perfect, solitary or in groups of 3's in terminal or axillary spikes, racemes or panicles. Bractlets connate, cupulate. Calyx-limb truncate or sometimes toothed. Petals usually 6, free, spreading in flower. Stamens alternately unequal, the fleshy filaments inserted below the middle of the petals. Ovary with an annular disk; style stout, columnar. Fruit a small fleshy berry. Embryo straight. [Greek, destroying.] About 45 species, natives of the West Indies and tropical South America. Known as HICACUILLO. Type species: *Loranthus clandestinus* Mart.

Branches terete, the twigs sometimes compressed.

Branches of the inflorescence scaly.

Branches of the inflorescence smooth.

Leaf-blades rounded or subtruncate at the base, abruptly contracted into the petiole; berry oval.

Leaf-blades gradually tapering into the petiole; berry obovoid or obovoid-cylindric.

Branches 4-angled.

1. *P. bicolor*.2. *P. Sintenisii*.3. *P. purpurea*.4. *P. caribaca*.1. **Phthirusa bicolor** (Krug & Urban) Engler in E. & P. Nat. Pfl. Nachtr. 2-4: 135. 1897.*Loranthus emarginatus* DC. Prodr. 4: 288, in part. 1830. Not Sw. 1788.*Dendropemon bicolor* Krug & Urban; Urban, Bot. Jahrb. 24: 24. 1897.*Phthirusa emarginata* Cook and Collins, Contr. U. S. Nat. Herb. 8: 217. 1903.

Young branches compressed, scaly. Leaf-blades narrowly to broadly obovate, 2-5 cm. long, 1-3.5 cm. broad, rounded or emarginate at the apex, cuneate at the base, short-petioled; racemes usually shorter than the leaves, the peduncles terete or slightly compressed, 1-2 cm. long, scaly; pedicels 1 mm. long or less; bractlets connate to about the middle; berry broadly ellipsoid, 7-8 mm. long, 4-4.5 mm. in diameter, red with black tip.

On trees and shrubs, Porto Rico. Endemic. Recorded by Bello as *Loranthus americanus* Jacq.

2. **Phthirusa Sintenisii** (Krug & Urban) Engler in E. & P. Nat. Pfl. Nachtr. 2-4: 135. 1897.*Dendropemon Sintenisii* Krug & Urban; Urban, Bot. Jahrb. 24: 25. 1897.

Branches terete or nearly so, smooth. Leaf-blades ovate or short-obovate, 5-6 cm. long, 4-5 cm. broad, rounded or submarginate at the apex, rounded or subtruncate at the base, the petioles 4-5 mm. long; racemes 4-6 cm. long, the peduncle smooth, slightly compressed; pedicels 1 mm. long or less; bractlets united; berry oval, 8 mm. long.

On a tree in a coffee plantation near Aibonito, collected only by Sintenis. Endemic.

3. **Phthirusa purpurea** (L.) Engler in E. & P. Nat. Pfl. Nachtr. 2-4: 135. 1897.*Viscum purpureum* L. Sp. Pl. 1023. 1753.*Dendropemon purpureus* Krug & Urban, Bot. Jahrb. 24: 26. 1897.

Branches smooth, not at all scaly, flattened when young, soon terete. Leaf-blades obovate or oblanceolate, 2.5-6 cm. long, 0.9-2.5 cm. broad, obtuse, subtruncate or acute at the apex and usually mucronulate, rarely retuse, narrowed at the base, the petioles 3-12 mm. long; racemes glabrous, several-many-flowered, shorter or longer than the leaves, the peduncles somewhat flattened; pedicels 1-3 mm. long; bractlets connate to about the middle; berry obovoid-cylindric or obovoid, 6-8 mm. long, black or blue-black. [*P. parvifolia* of Cook and Collins.]

On trees and shrubs, vicinity of Guanica, Porto Rico:—Bahamas; Cuba; Hispaniola.

4. **Phthirusa caribaea** (Krug & Urban) Engler in E. & P. Nat. Pfl. Nachr. 2-4: 135. 1897.

Loranthus occidentalis Sessé & Moc. Fl. Mex. ed. 2, 83. 1894. Not L. 1759.
Dendropemon caribaeus Krug & Urban; Urban, Bot. Jahrb. 24: 27. 1897.

Pendent, 5-8 dm. long; young branches 4-angled, smooth or somewhat scaly. Leaf-blades obovate, occasionally oval or suborbicular, rarely ovate, 2-6 cm. long, 1.5-4 cm. broad, rounded and emarginate and often mucronulate at the apex, rarely acute, narrowed or sometimes rounded at base, short-petioled; racemes glabrous or somewhat scaly, 1-6 cm. long, the peduncles compressed or angled; pedicels 1-2 mm. long, often with a furfuraceous decurrent line; bractlets connate to about the middle; berry obovoid, 7-8 mm. long, 4-5 mm. in diameter, blue-black.

On trees and shrubs, Porto Rico, abundant in the dry southern districts; Vieques; St. Thomas; St. Croix; St. Jan; Virgin Gorda; Tortola; Anegada;—Antigua to Barbados

Phthirusa pauciflora (Sw.) Eichl., endemic in Jamaica, was erroneously recorded by Krebs from St. Thomas [*Loranthus pauciflorus* Sw.].

2. **IXIDIUM** Eichl. in Mart. Fl. Bras. 5²: 130. 1868.

Parasitic plants with angled or compressed stems, the internodes continuous. Leaves alternate. Flowers in axillary spikes, monoecious, sessile, sunken in the rachis, the staminate and pistillate in the same spike, the staminate occupying the lower part, the pistillate the upper; staminate flowers with a 4-parted calyx; stamens 4, the filaments short, free; anthers 2-celled, longitudinally dehiscent; disk fleshy; ovary rudimentary. Pistillate flowers: calyx 3- or 4-lobed; ovary subovoid-cylindric: disk thick; style short; stigma obtuse. Fruit a berry; seeds subglobose; endosperm copious; embryo subclavate; cotyledons oblong. [Name derived from the Greek word for mistletoe.] Two species of tropical America. Type species: *Ixidium Schottii* Eichl.

1. **Ixidium Wrightii** (Griseb.) Eichl. in Mart. Fl. Bras. 5²: 132. 1868.

Eremolepis Wrightii Griseb. Mem. Am. Acad. II. 8: 192. 1860.

Branches more or less flexuose, angled or compressed. Leaf-blades obovate 1-2.4 cm. long, 5-10 mm. broad, rounded at the apex, cuneate at the base, 3-5-nerved, subsessile, coriaceous; spikes short, few-flowered; sepals persistent.

On trees in mountain forests of Porto Rico:—Cuba; Hispaniola.

3. **PHORADENDRON** Nutt. Journ. Acad. Phila. II. 1: 185. 1848.

Shrubs, parasitic on trees or sometimes on other mistletoes, mostly brittle at the nodes, with opposite coriaceous flat leaves or these sometimes reduced to scales, and terete or angled twigs. Flowers sessile, usually sunken in the rachis; superposed in 2-6 rows, rarely in 8 rows in each joint, dioecious or monoecious. Staminate flowers with a 3-lobed (occasionally 2-, 4-, or 5-lobed) calyx, bearing a nearly sessile 2-celled anther at the base of each lobe. Pistillate flowers with a similar calyx adnate to the inferior 1-celled ovary; ovules solitary; style short; stigma capitate. Fruit a fleshy berry. Seed with a small embryo enclosed in copious endosperm. [Greek, tree-thief, from its parasitic habit.] Over 200 species, natives of the West Indies, continental tropical America, and a few in North America. KNOWN AS PARASITICA, YERBA CAPITANA and MISTLETOE. Type species: *Phoradendron californicum* Nutt.

Scale-sheath at or near the base of the lowest internode only of a branch.

Leaves basinerved; flowers in 4 series, rarely in 5 series.

Branches acutely 4-angled or 4-winged.

Sepals inflexed.

Spikes 3.5-9 cm. long, the joints 14-34-flowered.

Spikes 1-3 cm. long; the joints 6-18-flowered.

Sepals erect, parted.

Branches terete or somewhat compressed.

Leaves lanceolate to ovate, 6-8 cm. long.

Leaves elliptic, 3-5 cm. long.

Leaves pinnately veined; flowers in 6 or 8 series.

Scale-sheath at or near the base of each internode of a branch.

Leaves pinnately veined.

Twigs terete or somewhat compressed; leaves dull.

Twigs 4-angled; leaves glossy.

Leaves basinerved.

1. *P. tetrapterum*.

2. *P. Randiae*.

3. *P. trinervium*.

4. *P. chryso carpum*.

5. *P. Helleri*.

6. *P. hexastichum*.

7. *P. piperoides*.

8. *P. racemosum*.

9. *P. dichotomum*.

1. **Phoradendron tetrapterum** Krug & Urban; Urban, Bot. Jahrb. 24: 35 1897.

Branches more or less spreading, the internodes acutely 4-angled or 4-winged. Scale-sheaths only at the base of the lowest internode of a branch; leaf-blades obovate, oblanceolate, elliptic-oblong or oblong-lanceolate, 4-10 cm. long, 1.5-4 cm. broad, obtuse or rounded at the apex, cuneately narrowed at the base, 5-nerved; spikes solitary or several together in the axils, 3.5-9 cm. long, 4-6-jointed; flowers in 4 series, rarely 5 series; berry subglobose or broadly ellipsoid, 3-3.5 mm. long, white; sepals not meeting.

On trees and on other mistletoes, Porto Rico, in moist districts:—Jamaica, Martinique. Recorded by Kuntze as *Phoradendron multifoveolatum* Eichl.

2. **Phoradendron Randiae** (Bello) Britton.

Viscum angustifolium Bertero; Spreng. Syst. 1: 487. 1825. Not *P. angustifolium* Eichl.

Phoradendron rubrum Griseb. Fl. Br. W. I. 314, in part. 1860.

Viscum Randiae Bello, Anal. Soc. Esp. Hist. Nat. 10: 278. 1881.

Phoradendron antillarum Trel. Gen. Phorad. 111. 1916.

Branches more or less pseudodichotomous, the internodes acutely 4-angled. Scale-sheaths at the base of the lowest internode only of a branch; leaf-blades oblong-lanceolate, lanceolate, linear-lanceolate or narrowly obovate, 3-10 cm. long, 0.5-2 cm. broad, obtuse or acute at the apex, cuneately narrowed at the base, subsessile, 3-5-nerved; spikes usually several, 1-3 cm. long, 3-4-jointed; flowers in 4 series; berry subglobose, 3-4 mm. in diameter, yellow; sepals closely inflexed.

On trees, Porto Rico; at lower and middle elevations:—Cuba; Jamaica; Hispaniola; Antigua; Guadeloupe; Dominica. Referred by Urban to *P. quadrangulare* (H.B.K.) Krug & Urban. QUASIMILLA DE CANARIO.

3. **Phoradendron trinervium** (Lam.) Griseb. Fl. Br. W. I. 314. 1860.

Viscum verticillatum L. Sp. Pl. ed. 2, 1452, in part. 1763. Not L. 1753.

Viscum trinervium Lam. Encycl. 3: 57. 1789.

Phoradendron verticillatum Fawc. & Rend. Fl. Jam. 3: 96. 1914.

Branches pseudodichotomous, the internodes often short, 4-angled. Scale-sheaths at the base of the lowest internode only of a branch, sometimes with a second sheath a short distance above; leaf-blades obovate or elliptic-oblong, 2-6 cm. long, 1-3.6 cm. broad, rounded at the apex, narrowed or cuneate at the base, scarcely petioled; spikes usually clustered, 1-2 cm. long, 2-4-jointed; flowers in 4 series; berry subglobose, 3-4 mm. in diameter, orange; sepals erect.

On trees, Porto Rico, mostly in the dry southwestern districts, but found also near Las Cruces; St. Thomas:—Bahamas; Jamaica; Hispaniola to Trinidad.

4. **Phoradendron chrysocarpum** Krug & Urban; Urban, Bot. Jahrb. **24**: 39. 1897.

Viscum flavens Spreng. Syst. **1**: 488, in part. 1825. Not Sw. 1788.

Viscum anceps DC. Prodr. **4**: 282. 1830. Not Spreng. 1825.

Branches rather long, often little forked, the internodes usually compressed. Scale-sheath at the base of the lowest internode only of a branch; leaf-blades oblong-lanceolate to ovate-lanceolate, elliptic or broadly ovate, 4.5–14 cm. long, 2–8 cm. broad, obtuse or rounded at the apex, cuneately narrowed at the base, 5-nerved; spikes several in the axils, 1.5–3 cm. long; flowers in 4 series; berry ovoid, 5–5.5 mm. long, white or yellow; sepals closely inflexed.

On trees, Porto Rico, at lower elevations, mostly in dry districts; St. Thomas; St. Croix;—Guadeloupe; Dominica; Martinique; St. Vincent. Recorded by Eggers as *Phoradendron flavens* Griseb.; by Bello as *Phoradendron Berterianum* Griseb.; and by Millspaugh as *Phoradendron martinicense* (DC.) Griseb. PATA DE GALLINA.

5. **Phoradendron Helleri** Trel. Gen. Phorad. 100. 1916.

Plant up to 8 dm. long, the branches more or less pseudodichotomous, the internodes rather short, the upper compressed. Scale-sheath at the lowest internode only a branch; leaf-blades oblong-elliptic, 3–5 cm. long, 1.5–2.5 cm. broad, rounded at the apex, cuneate at the base, petioled, 3–5-nerved; spikes solitary or several, 1.5–2.5 cm. long, about 3-jointed; flowers in 4 series; berry ovoid, 4 mm. long, nearly white when unripe; sepals nearly or quite closed.

On trees; southwestern dry districts of Porto Rico. Endemic.

6. **Phoradendron hexastichum** (DC.) Griseb. Fl. Br. W. I. 313. 1860.

Viscum hexastichum DC. Prodr. **4**: 282. 1830.

Branches rather long, scarcely forked, stout, erect, the internodes compressed. Scale-sheath at the base of the lowest internode only of a branch; leaf-blades oblong-ovate or ovate, 6–13 cm. long, 3–6.5 cm. broad, obtuse or rounded at the apex, often somewhat inequilateral and narrowed or sometimes rounded at the base, more or less distinctly petioled, pinnately veined; spikes solitary or clustered, 2–6 cm. long, 3–4-jointed; flowers in 6 or 8 series; berry subglobose, 3–4 mm. in diameter, white, smooth; sepals closely inflexed.

On trees, Porto Rico, in mountain forests;—Cuba; Hispaniola; Guadeloupe; Martinique; St. Vincent; Grenada; also recorded from continental tropical America by Eichler.

7. **Phoradendron piperoides** (H.B.K.) Trel. Gen. Phorad. 145. 1916.

Viscum latifolium Sw. Prodr. 268. 1797. Not Lam. 1789.

Loranthus piperoides H.B.K. Nov. Gen. **3**: 443. 1818.

Phoradendron latifolium Griseb. Fl. Br. W. I. 314. 1860.

Branches rather slender, the internodes long, terete, often somewhat compressed just below the nodes. Scale-sheaths at the base of each internode; leaf-blades lanceolate to ovate or oval, 5–12 cm. long, 2–6.5 cm. broad, often bluntly acute or acuminate, rarely rounded at the apex, narrowed at the base, dull, scarcely petioled, obscurely pinnately veined; spikes often dull red, 3–7 cm. long, usually clustered, 2.5–6 cm. long, 4–8-jointed; flowers in 4 series, rarely in 6 series; berry ellipsoid or ovoid, 3.5–4.5 mm. long, yellow or orange; sepals ascending, usually somewhat parted.

On trees, Porto Rico; in wet or moist districts;—Cuba; Jamaica; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

8. **Phoradendron racemosum** (Aubl.) Krug & Urban; Urban, Bot. Jahrb. **24**: 46. 1897.

Viscum racemosum Aubl. Pl. Guian. **2**: 895. 1775.

Viscum latifolium Lam. Encyc. **3**: 57. 1789.

Viscum macrophyllum Spreng. Syst. **1**: 488. 1825.

Phoradendron penninervium Eichl. in Mart. Fl. Bras. **5**²: 128. 1868.

Branches usually forked, the internodes quadrangular, often somewhat enlarged just below the nodes. Scale-sheaths near the base of each internode; leaf-blades various, broadly lanceolate, elliptic, ovate, oval or orbicular, 7–15 cm. long, 4–10.5 cm. broad, shining, obtuse or rounded at the apex, acute or sometimes rounded at the base, distinctly petioled, pinnately nerved; spikes usually several, 2.5–5 cm. long, 3–5-jointed; flowers in 4 series; berry broadly ellipsoid, 4 mm. long, white; sepals inflexed or somewhat parted.

On trees, Porto Rico, mostly in moist districts; St. Thomas (according to Kuntze):—Bahamas; Cuba; Hispaniola; South America.

9. **Phoradendron dichotomum** (Bert.) Krug & Urban; Urban, Bot. Jahrb. **24**: 48. 1897.

Viscum dichotomum Bert.; Spreng. Syst. **1**: 488. 1825.

Branches forked at each node, the internodes terete or slightly compressed when young. Scale-sheaths at the base of each internode often with a second sheath a short distance above; leaf-blades lanceolate to ovate-elliptic, 5–12 cm. long, 2–5.7 cm. broad, obtuse or acute at the apex, cuneate at the base, 3–7-nerved; spikes solitary or several, 3.5–7 cm. long, 4–7-jointed; flowers in 4 series; berry subglobose, 4–5 mm. in diameter, white; sepals inflexed.

On trees, Porto Rico, in moist districts:—Cuba; Hispaniola.

Phoradendron anceps (Spreng.) Krug & Urban, is recorded by Trelease as preserved in the Prag Museum labeled as from Porto Rico (Bertero 439 in part); perhaps due to a mixture of specimens of *P. anceps* from Santo Domingo with specimens of *P. chrysocarpum* from Porto Rico.

4. **DENDROPTHORA** Eichl. in Mart. Fl. Bras. **5**²: 102. 1868.

Shrubs, parasitic, the branches articulated at the nodes, the internodes terete, 4-angled, or flattened and phyllode-like. Leaves opposite, reduced to scales, or wanting. Spikes axillary or terminal, articulated, bracted at each joint. Flowers monoecious or dioecious, sessile, usually sunken in the rachis, solitary or several on each side of a joint, usually superposed in 2 rows or sometimes 4. Staminate flowers with a 3-lobed (rarely 4-lobed) calyx; filaments wholly adnate to the sepals; anthers sessile. Pistillate flowers with a 3-lobed calyx; ovary inferior. Fruit a berry. Seed with a small embryo enclosed in copious endosperm. [Greek, tree destroyer.] About 40 species, natives of the West Indies and tropical America. Type species: *Viscum opuntioides* L.

Monoecious; leaves present or wanting.

Spikes with 2–5 joints; sepals forming a distinct crown on the fruit.

Spikes with 6–18 joints; sepals not exceeding the tip of the fruit.

Dioecious; aphyllous; scales of the branches conspicuous, decussate.

1. *D. Wrightii*.

2. *D. flagelliformis*.

3. *D. domingensis*.

1. **Dendrophthora Wrightii** Eichl. in Mart. Fl. Bras. **5**²: 103. 1868.

Arceuthobium macrostachyum Griseb. Mem. Am. Acad. II. **8**: 191. 1860.

Not *Viscum macrostachyum* Jacq.

Branches yellow-green or greenish, the internodes terete, 1–2.5 cm. long. Leaves often wanting, the blades, when present, obovate, 0.8–3.5 cm. long, 0.6–

1.5 cm. broad, rounded at the apex, cuneate at the base, 3-nerved, short-petioled; flowers monoecious; spikes rather slender, 2-5-jointed, the joints 5-10 mm. long; flowers biseriate, 2-6 or occasionally 8 in each joint; berry ovoid, 4.5-5 mm. long, 4-4.5 mm. broad; sepals forming a distinct crown on the fruit.

On trees in the dry southwestern districts of Porto Rico:—Cuba.

2. **Dendrophthora flagelliformis** (Lam.) Krug & Urban, Ber. Deutsch. Bot. Gesell. 14: 287. 1896.

Viscum flagelliforme Lam. Encycl. 3: 56. 1789.

Viscum leptostachyum DC. Prodr. 4: 28. 1830.

Dendrophthora leptostachya Eichl. in Mart. Fl. Bras. 5²: 104. 1868.

Pendent or spreading; internodes 2-5 cm. long, 2.5-4.5 mm. thick. Leaves often wanting, the blades, when present, narrowly oblong to oblong-obovate, 2.5-5 cm. long, 6.5-14 mm. broad, obtuse or rounded at the apex, cuneate at the base, 3-nerved, petioled or subsessile; flowers monoecious; spikes slender, 6-25 cm. long, 6-18-jointed; flowers biseriate, 4-10 or occasionally 12 or 14 in each joint; berry ovoid, 5-6 mm. long, 3.5-4 mm. broad; sepals not exceeding the tip of the fruit.

On *Petitia domingensis* and other woody plants, at lower and middle elevations, Porto Rico:—Cuba; Hispaniola. Recorded by Bello as *Arceuthobium opuntoides* Griseb.

3. **Dendrophthora domingensis** (Spreng.) Eichl. in Mart. Fl. Bras. 5²: 103. 1868.

Viscum domingense Spreng. Syst. 1: 487. 1825.

Arceuthobium domingense Griseb. Cat. Pl. Cub. 121. 1866.

Much-branched, leafless, 2.5-5 dm. long or more, slender, with loosely articulate greenish or greenish-yellow branches, the internodes 1-2.5 cm. long, terete, 3-5 mm. thick. Scales decussate; flowers dioecious, the staminate spikes rather stout, up to 4 cm. long, 3-7-jointed, the flowers biseriate, 4-10 in each joint; pistillate spikes stout, 0.5-2 cm. long, the joints 2-4 mm. long, the flowers 2 in each joint; berry ovoid, 5 mm. long; sepals forming a distinct crown on the fruit.

On trees, Porto Rico, in moist districts:—Cuba; Hispaniola.

Family 3. **BALANOPHORACEAE** Lindl.

BALANOPHORA FAMILY.

Fleshy root-parasites without leaves or chlorophyll. Flowers monoecious or dioecious, often minute, crowded on spadix-like peduncled heads or cones. Staminate flowers usually much larger than the pistillate, the perianth none or of 3-8-valvate lobes; stamens opposite the perianth-lobes; filaments free or connate into a column or tube; anthers free or connate, 2-many-celled, each cell dehiscing by pores or chinks, or rupturing irregularly. Perianth of the pistillate flowers none, or 2-lipped or tubular; ovary 1-3-celled; ovules solitary in each cell; pendulous; styles terminal. Fruit a minute 1-celled, 1-seeded nut. Seed with endosperm; embryo minute. About 14 genera and 40 species of wide geographic distribution in damp forests of the tropics.

1. **SCYBALIUM** Schott. & Endl. Melet. 3. 1832.

Low blood-red plants, with tuberous rhizomes, parasitic on roots of various dicotyledonous trees and shrubs, the thick fleshy peduncles clothed with numerous imbricated scales, enlarged above, the bracts imbricated, deciduous. Staminate

flowers: tube of the perianth cylindric, the lobes 3, concave; stamens 3, the filaments connate into a tube; anthers opposite the lobes of the perianth, connate, several-celled. Pistillate flowers: perianth wanting; ovary 2-celled; styles 2, filiform; stigmas capitate; ovules 2, anatropous. Fruit 1-celled, 1-seeded. Seed oblong, with oily endosperm; embryo minute, apical. [From the Greek, cast off, from the dropping of the scales.] About 4 species, natives of the West Indies and South America. Type species: *Scybalium fungiforme* Schott. & Endl.

1. **Scybalium jamaicense** (Sw.) Schott. & Endl. Melet. 12. 1832.

Cynomorium jamaicense Sw. Prodr. 12. 1788.

Phyllocoryne jamaicensis Hook. f. Trans. Linn. Soc. 22: 51. 1856.

Rhizome long, cylindric, the peduncles 3–18 cm. long; scales brown, broadly triangular or triangular-ovate, 5–7 mm. long, 6–12 mm. broad, acute or acuminate at the apex, passing into the larger broadly triangular bracts. Capitulum blood-red, 2.5–6 cm. long.

Primeval forest on the summit of Mt. Galsa, near Adjuntas, Porto Rico:—Jamaica; Cuba; Hispaniola.

Order 8. ARISTOLOCHIALES.

Herbs or vines, mostly with cordate or reniform leaves and perfect flowers. Calyx inferior, its tube wholly or partly adnate to the ovary. Corolla none. Ovary several-(mostly 6-)celled. Only the following family.

Family 1. ASARACEAE Link.

BIRTHWORT FAMILY.

Acaulescent plants, or with erect or twining stems. Leaves alternate, often basal, estipulate. Flowers regular or irregular, solitary or clustered. Calyx-limb 3–6-lobed or irregular. Stamens 6–many, the filaments free from or adnate to the style-column anthers 2-celled, their sacs longitudinally dehiscent. Ovary 4–6-celled, inferior or superior. Ovules numerous in each cavity, anatropous, horizontal or pendulous. Fruit a many-seeded, 6-celled capsule. Seeds angled or compressed, with a crustaceous testa and usually with a fleshy or dilated raphe; endosperm fleshy, copious; embryo minute. Six genera and about 200 species of wide distribution in tropical and temperate regions.

1. **ARISTOLOCHIA** L. Sp. Pl. 960. 1753.

Perennial herbs or twining vines. Leaves alternate, mostly petioled, entire or 3–7-lobed, often cordate or auriculate, palmately nerved. Flowers irregular. Calyx adnate to the ovary, at least to its base, the tube usually inflated around the style and contracted at the throat, the limb spreading or reflexed, entire, 3–6-lobed or appendaged. Stamens mostly 6; anthers adnate to the short style or stigma, 2-celled, the sacs longitudinally dehiscent. Ovary mostly 6-celled with 6 parietal placentae. Style 3–6-lobed. Capsule naked, septically 6-valved. Seeds very numerous, horizontal, compressed. [Named for its supposed medicinal properties.] About 180 species, widely distributed in tropical and temperate regions. Type species: *Aristolochia rotunda* L.

Leaves 3-lobed; perianth-limb ovate to orbicular-ovate, 1.7-2.2 cm. broad with a slender tail 1-3 dm. long.

Leaves not 3-lobed.

Limb of the perianth large, oblong-ovate or triangular-ovate, mucronate, 5.5-8 cm. long, 4-5 cm. broad at the base.

Limb of the perianth small, linear or subtriangular, 1.2-2 cm. long, 1.2-10 mm. wide.

Perianth-limb linear, 1.5-2 cm. long, 1.2-1.5 mm. broad above the base; leaves mostly triangular-ovate.

Perianth-limb subtriangular when flattened, about 1.2 cm. long, 1 cm. wide; leaves oblong-ovate or elliptic-ovate.

1. *A. trilobata*.

2. *A. odoratissima*

3. *A. anguicida*.

4. *A. oblongata*

1. ***Aristolochia trilobata*** L. Sp. Pl. 960. 1753.

An ill-smelling vine 2-5 m. long. Leaves 3-lobed, occasionally with some entire ones on the same stems, orbicular in outline, 5-14 cm. long, 6-17 cm. broad, glabrous above, more or less densely puberulent beneath, cordate or subtruncate at the base; petioles 1.5-5 cm. long; bracts oval or suborbicular, cordate; pedicels 4-8.5 cm. long, slender and glabrous; perianth greenish yellow, more or less mottled, the lower inflated portion 3-5 cm. long, the upper tubular portion 3.5-5.5 cm. long, the limb ovate to orbicular-ovate, 1.7-2.2 cm. broad, the slender tail 1-3 dm. long; capsule 6-8 cm. long; seeds triangular, about 7 mm. long.

Moist thickets at lower elevations, Porto Rico; St. Thomas; St. Jan; Tortola; St. Croix (according to West):—West Indies; continental tropical America. CACHIMBOS. PANITOS. BEJUCO DE SANTIAGO.

2. ***Aristolochia odoratissima*** L. Sp. Pl. ed. 2, 1362. 1762.

A rather pleasantly odorous vine. Leaves triangular-ovate to oval-ovate, 6-14 cm. long, 4-8.5 cm. broad, entire, glabrous above, puberulent beneath; petioles 1.5-6 cm. long; bracts broadly elliptic, cordate; pedicels 3.5-7 cm. long; lower inflated portion of the perianth 1.5-2 cm. long, 1-1.3 cm. broad, the upper tubular portion 0.8-1.5 cm. long, the limb oblong-ovate or triangular-ovate, 5.5-8 cm. long, 4.5 cm. broad, mucronate at the apex, deeply cordate at the base; capsule 6-7 cm. long; seeds short-ovate, 3-3.5 mm. long, 2.8-3 mm. broad.

Hillside thickets, St. Jan:—Jamaica; continental tropical America.

3. ***Aristolochia anguicida*** Jacq. Enum. 30. 1760.

A slender vine. Leaves triangular-ovate to broadly short-ovate, 4.5-10 cm. long, 3.5-8 cm. broad, entire; glabrous or with few scattered hairs on the veins above, puberulent beneath; petioles 2-5 cm. long, bracts oval; pedicels slender, 2.5-3.5 cm. long; lower inflated portion of the perianth 1 cm. long or less, the tube 1.6-2 cm. long, slender below, enlarged at the mouth, the linear limb 1.5-2 cm. long.

Thickets, St. Thomas (according to Krebs); St. Croix:—Lesser Antilles; South America.

4. ***Aristolochia oblongata*** Jacq. Hort. Schoenbr. 2: 29. 1797.

Aristolochia calceiformis Urban, Symb. Ant. 1: 300. 1899.

A slender vine, 3 m. long or longer, the branches, petioles and pedicels often pilose. Leaves oblong-ovate or elliptic-ovate, 4.5-10 cm. long, 2-4.5 cm. broad, entire, glabrous above, minutely pilose and finely reticulate-veined beneath, acute at the apex, cordate or subtruncate at the base; petioles 1-2.5 cm. long; bracts reniform; pedicels 1.5-2 cm. long; the lower inflated portion oval, 7-8 mm. long, 4-5 mm. thick; the cylindrical tube 2 mm. wide at the base, 10 mm. wide at the top of the funnel-shaped throat, the limb subtriangular when flattened,

about 12 mm. long, 10 mm. wide; capsule 2–2.5 cm. long, 1.2–1.5 cm. broad; seeds ovate-triangular, 4.5–5 mm. long, 3–4 mm. broad.

Thickets at lower and middle elevations in moist districts of Porto Rico:—Cuba; Hispaniola; (Venezuela?). Recorded by Sessé & Mocino as *A. longifolia*.

Aristolochia galeata Mart., Brazilian, grown for ornament in Porto Rico gardens, has reniform-orbicular thin leaves 8–15 cm. broad, large thin stipules and large mottled flowers.

Aristolochia grandiflora Sw. was erroneously recorded from Porto Rico by Duchartre.

Aristolochia ringens Vahl, was formerly cultivated on St. Croix, according to West.

Order 9. POLYGONALES.

Herbs, twining vines, shrubs or trees, with alternate, or sometimes opposite or whorled, simple mostly entire leaves, often jointed stems, and usually sheathing united stipules (ocreae). Flowers small, regular, perfect, dioecious, monoecious or polygamous. Petals none. Calyx inferior, 2–6-cleft or 2–6-parted, the segments or sepals more or less imbricated, sometimes petaloid, sometimes developing wings in fruit. Stamens 2–9, inserted near the base of the calyx; filaments filiform or subulate, often dilated at the base, distinct or united into a ring; anthers 2-celled, the sacs longitudinally dehiscent. Ovary superior, 1-celled; ovule solitary, orthotropous, erect or pendulous; style 2–3-cleft or 2–3-parted, sometimes very short; stigmas capitate or tufted, rarely 2-cleft; fruit a lenticular 3-angled or rarely 4-angled achene, usually invested by the persistent calyx; endosperm mealy; cotyledons accumbent or incumbent; embryo straight or nearly so. Only the following family.

Family 1. POLYGONACEAE Lindl.

BUCKWHEAT FAMILY.

About 40 genera and 800 species, of wide geographic distribution.

Herbaceous plants.

Erect or ascending herbs.

Stigmas tufted.

Stigmas not tufted.

Climbing vines.

Trees or shrubs.

1. *Rumex*.

2. *Persicaria*.

3. *Antigonon*.

4. *Coccolobis*.

1. RUMEX L. Sp. Pl. 333. 1753.

Perennial or annual herbs, some species slightly woody. Stem grooved, mostly branched. Leaves flat or crisped, the ocreae brittle and fugacious, the inflorescence of simple or compound, often paniced racemes. Flowers green, perfect, dioecious, or polygamo-monoecious, whorled, on jointed pedicels. Corolla none. Calyx 6-parted, the 3 outer sepals unchanged in fruit, the 3 inner ones mostly developed into wings, one or all three of which usually bear a callosity (tubercle); wings entire, dentate, or fringed with bristle-like teeth. Stamens 6,

filaments glabrous. Style 3-parted; stigmas peltate, tufted; achene 3-angled, the angles usually margined. Embryo borne in one of the faces of the 3-angled seed. [The ancient Latin name.] About 130 species, of wide geographic distribution. Type species: *Rumex Patientia* L.

1. **Rumex crispus** L. Sp. Pl. 335. 1753.

Perennial, glabrous, dark green; stem rather slender, erect, 3-10 dm. tall. Leaves crisped and wavy-margined, the lower oblong or oblong-lanceolate, 15-30 cm. long, long-petioled, the upper narrowly oblong or lanceolate, 7-15 cm. long, short-petioled, all cordate or obtuse at the base; panicle rather open; racemes simple or compound; flowers rather loosely whorled; fruiting pedicels $1\frac{1}{2}$ -2 times as long as the calyx-wings, jointed near the base; wings cordate, 3-4 mm. long, truncate or notched at base, erose-dentate, or nearly entire, each bearing a tubercle; achene 2 mm. long, dark brown.

Hillsides, roadsides and river-banks at middle and higher elevations, Porto Rico:—Bermuda; Cuba; Hispaniola; Guadeloupe; Jamaica; temperate North and South America. Native of the Old World. CURLED DOCK. COL AGRIA. VINAGRILLO.

Rumex vesicarius L., of the Mediterranean region, is recorded by Eggers as having been cultivated in the Virgin Islands. It is an annual herb, with somewhat fleshy, subhastate leaves, the calyx-wings broad, finely reticulated. Krebs mentions it as found on the sea beaches of St. Thomas prior to 1852.

2. **PERSICARIA** [Tourn.] Mill. Gard. Dict. Abr. ed. 4. 1754.

Herbs, with alternate entire leaves, cylindric ocreae, and small flowers in spike-like racemes, the ocreolae funnelform, the short pedicels jointed at the base of the calyx. Sepals mostly 5, neither winged nor keeled. Stamens 4-8, included or exserted, the filaments erect or nearly so. Styles 2 or sometimes 3, usually partly united; stigmas capitate. Achene lenticular, or sometimes 3-angled, usually black. Endosperm horny; cotyledons accumbent. [From *Persica*, the leaves resembling those of the peach.] About 125 species, widely distributed, known as SMARTWEED and YERBA DE HICOTEA. Type species: *Polygonum Persicaria* L.

Ocreae and ocreolae ciliate and pubescent.

Achenes trigonous; stigmas 3.

Achenes lenticular; stigmas 2.

Ocreae and ocreolae eciliate, glabrous.

Peduncles glabrous; achenes shining.

Peduncles glandular-pubescent; achenes dull.

1. *P. punctata*.

2. *P. acuminata*.

3. *P. portoricensis*.

4. *P. segetum*.

1. **Persicaria punctata** (Ell.) Small, Fl. SE. U. S. 379. 1903.

Polygonum punctatum Ell. Bot. S. C. & Ga. 1: 455. 1817.

Polygonum acre H.B.K. Nov. Gen. 2: 179. 1817. Not Lam. 1778.

Annual or perennial, glabrous or very nearly so; stem erect or ascending, rarely prostrate, simple or branched, 3-12 dm. long. Leaf-blades lanceolate or oblong-lanceolate, 3-20 cm. long, acuminate at both ends, petioled, ciliate, conspicuously punctate, acrid, the midrib often with a few scattered hairs; ocreae cylindric, fringed with long bristles falling away at maturity, racemes narrow, erect or slightly drooping, loosely-flowered, 2-8 cm. long; calyx greenish; stamens 8; style 2-3-parted to the base; achene oblong, thick, lenticular or 3-angled, 2.5 mm. long, smooth, shining.

Wet grounds and waste places at lower and middle altitudes, Porto Rico:—Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad, continental temperate and tropical America.

2. **Persicaria acuminata** (H.B.K.) Maza, Per. Cub. 278. 1896.

Polygonum acuminatum H.B.K. Nov. Gen. 2: 178. 1817.

Perennial; stem stout, erect, usually glabrous below, strigose above, 0.5–2 m. high. Leaf-blades lanceolate, more or less strigose on both sides, 0.6–3 dm. long, the apex long-acuminate, the base narrowed, the petioles usually less than 1 cm. long; ocreae cylindric, 2–4 cm. long, strigose, fringed with long bristles; racemes few or several, densely flowered, 10 cm. long or less; ocreolae about 3 mm. long, fringed; pedicels 2–4 mm. long; calyx white, about 3 mm. long, 4-parted or 5-parted; stamens 5–9, included; stigmas 2; achene lenticular, shining, black, 2–2.5 mm. long.

Wet grounds at low elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; Trinidad; continental tropical America.

3. **Persicaria portoricensis** (Bert.) Small, Fl. SE. U. S. 377. 1903.

Polygonum portoricense Bert.; Small, Mem. Bot. Col. Coll. 1: 46. 1895.

Polygonum glabrum C. & S. Linnaea 3: 46. 1828. Not Willd. 1799.

Perennial, more or less scurfy; stem 1–1.5 m. long or longer, branched, enlarged at the nodes. Leaf-blades lanceolate or linear-lanceolate, 4–30 cm. long, acuminate at both ends, obscurely punctate, short-petioled, the nerves prominent beneath; ocreae cylindric, sometimes bristly when young, naked when mature; racemes narrow, 2.5–13 cm. long, dense, erect; calyx white or whitish, 5-parted to near the base; stamens 6–8, included; style 2–3-cleft, somewhat exserted; achene lenticular and strongly biconvex or 3-angled, 2–3 mm. long, broadly oblong, orbicular or even broader than high, black, smooth and shining, or minutely granular.

Wet grounds at lower and middle elevations, Porto Rico:—southern United States; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; continental tropical America.

4. **Persicaria segetum** (H.B.K.) Small, Fl. SE. U. S. 378. 1903.

Polygonum segetum H.B.K. Nov. Gen. 2: 177. 1817.

Perennial, glabrous below; stem erect, 3–9 dm. tall, the nodes swollen; peduncles glandular. Leaf-blades lanceolate, acuminate at the apex, narrowed at the base, petioled, ciliate, 5–16 cm. long; ocreae cylindric, naked, glabrous; racemes paniced, erect, oblong or cylindric, 2–5 cm. long; calyx pink; stamens 6 or 7; achene lenticular, brown, dull, 2.5 mm. long. [*Polygonum pennsylvanicum* of Urban, not of Linnaeus.]

Ditches near Rincon, Porto Rico:—Jamaica; Cuba; Hispaniola; continental tropical America.

3. **ANTIGONON** Endl.; H. & A. Bot. Beech. Voy. 308. 1838.

Vines with alternate petioled cordate entire leaves, the petiole-bases clasping, and small flowers in racemes opposite the leaves or clustered at the summit, the racemes terminating in tendrils. Sepals 5, unequal, the 3 outer ones cordate, ovate, the 2 inner ones oblong. Stamens 5, equal, the filaments subulate, connate at the base. Ovary 3-angled; ovule erect; styles 3, recurved. Achene enclosed in the accrescent calyx. [Greek, opposite the nodes.] Three or four species native of Mexico and Central America. Type species: *Antigonon leptopus* H. & A.

Outer sepals orbicular-ovate in anthesis, ovate in fruit, inner sepals lanceolate; achenes slightly angled below the apex. 1. *A. leptopus*.
Outer sepals orbicular-reniform in anthesis, orbicular in fruit, inner sepals ovate; achenes wing-angled below the apex. 2. *A. macrocarpum*.

1. **Antigonon leptopus** H. & A. Bot. Beech. Voy. 308. 1838.

Herbaceous, climbing, branched, often 5 m. long or longer, finely pubescent at least above. Leaves thin, broadly ovate, 3–9 cm. long, puberulent, acuminate at the apex, rather deeply cordate at the base, the petioles 1–5 cm. long; racemes several or many, loosely several-flowered, the floriferous part 3–8 cm. long, the tendrils as long or shorter; pedicels slender, 10 mm. long or less; flowering calyx pink, rose or sometimes white, about 5 mm. long; fruiting calyx 1–1.5 cm. long, the sepals less than 1 cm. wide, strongly veined.

Waste ground, spontaneous after cultivation, Porto Rico; Vieques:—Florida; West Indies; commonly cultivated for ornament in Porto Rico and the Virgin Islands. Native of Mexico. CORALLINA. CORALLILO.

2. **Antigonon macrocarpum** Britton and Small, sp. nov.

Vine similar to *A. leptopus* in habit. Leaves thicker and more pubescent, broadly ovate to orbicular-ovate, 12 cm. long or less, short-acuminate, acute or obtuse at the apex, undulate, deeply cordate at the base, the petioles mostly 1 cm. long or less; racemes elongated, interrupted, usually with 3–6 tendrils near the tip; pedicels relatively stouter than in *A. leptopus*, densely pubescent; flowery calyx light-pink, about 12 mm. long; fruiting calyx conspicuously enlarged, 2.5–3 cm. long and wide, finely veined. [*Antigonum cordatum* of Eggers and of Millsbaugh; *A. cinerescens* of Britton.]

Roadsides, St. Thomas, spontaneous after cultivation, and cultivated on Porto Rico and St. Croix. Native of Costa Rica. Type collected at Livingston, Costa Rica, by W. W. Rowlee, May 16, 1918 (No. 28).

4. **COCCOLOBIS** P. Br. Civ. & Nat. Hist. Jan. 209. 1756.

Shrubs or trees, with alternate entire leaves, the ocreae cylindric or funnel-form, often very small, the small, usually green flowers racemose or spicate, subtended by minute bracts and ocreolae. Perianth accrescent, enclosing the achene, its lobes 5. Stamens 8, the filaments slender. Ovary 3-angled; ovule erect; styles 3. Fruit ovoid or globose, the accrescent perianth becoming fleshy and more or less adherent to the achene. Seed-coat thin; endosperm mealy. [Greek, referring to the adherent calyx.] Over 125 species of tropical and subtropical distribution, all American, known in Porto Rico as UVERO and UVILLO. Type species: *Polygonum Uvifera* L.

1. Perianth-tube accrescent, enclosing the fruit.

A. Pedicels very short, 1 mm. long in fruit, or less, or none.

a. Rachis of the inflorescence glabrous.

Venation of upper leaf-surfaces inconspicuous.

Inflorescence longer than the leaves; fruit coronate.
Inflorescence mostly not longer than the leaves; fruit not coronate.

Venation of upper leaf-surfaces conspicuous.

b. Rachis of the inflorescence puberulent; leaves densely reticulate-veined.

Inflorescence longer than the leaves; fruit coronate.
Inflorescence scarcely longer than the leaves; fruit not coronate.

B. Pedicels longer, 1.5 mm. long in fruit, or longer.

Rachis of the inflorescence glabrous.

Leaves suborbicular, rounded.

Leaves ovate to elliptic or obovate.

Leaves cordate, large, 10–25 cm. long; calyx red.

Leaves obtuse or subcordate at base, smaller; calyx greenish white.

Rachis of the inflorescence pubescent or puberulent; leaves very large.

Leaves pilose beneath.

Leaves glabrous beneath.

2. Perianth-lobes accrescent, enclosing the fruit.

Species not grouped, known from foliage only.

1. *C. piriifolia*.2. *C. Krugii*.3. *C. borinquensis*.4. *C. diversifolia*.5. *C. obtusifolia*.6. *C. Uvifera*.7. *C. Sintensisii*.8. *C. laurifolia*.9. *C. grandifolia*.10. *C. rugosa*.11. *C. venosa*.12. *C. rupicola*.

1. **Coccolobis pirifolia** Desf. Cat. Hort. Paris ed. 3, 389. 1829.

Coccoloba Kunthiana Meisn. in DC. Prodr. 14: 166. 1856.

A tree, up to 10 m. high, or sometimes shrubby, the slender twigs glabrous. Ocreae acuminate, glabrous, 10 mm. long or less, fugacious; petioles 6–12 mm. long; leaf-blades subcoriaceous, ovate to elliptic, glabrous, 4–10 cm. long, the apex bluntly acute, acuminate, or obtuse, the base narrowed or obtuse, the venation inconspicuous on the upper side; inflorescence terminal, very slender, spike-like, glabrous, drooping in fruit, usually much longer than the leaves, the nodes 1-flowered, the flowers sessile; bracts triangular, about 1 mm. long; ocreolae as long as the bracts, 3-lobed; calyx campanulate, greenish, 1 mm. long; fruit subglobose, about 4 mm. in diameter, coronate.

Woodlands and hillsides in moist or wet districts of Porto Rico, ascending into the mountain forests at higher elevations; St. Thomas (according to Lindau):—Jamaica.

2. **Coccolobis Krugii** Lindau, Bot. Jahrb. 13: 145. 1890.

A glabrous shrub or small tree, sometimes about 8 m. high, the slender twigs short and numerous, the bark smooth, gray. Leaf-blades broadly ovate or nearly orbicular, light green, subcoriaceous, rounded or obtuse at the apex, cordate or subcordate at the base, 6 cm. long or less, inconspicuously veined above, densely finely reticulate-veined beneath, the rather stout petioles 4–8 mm. long, the ocreae appressed, short; spikes very slender, glabrous, mostly as long as the leaves or shorter, loosely flowered; pedicels less than 0.5 mm. long; perianth green, about 1.5 mm. long; stamens white; fruit ovoid or ovoid-globose, 4–6 mm. long, slightly ribbed, black, capped by the perianth-segments, the pericarp some- what fleshy.

Low woods, hillsides and thickets at low elevations, Porto Rico, in dry parts of the southwestern districts; Vieques; Little St. James Island; Anegada:—Bahamas; St. Martin; Barbuda; Jamaica.

3. **Coccolobis borinquensis** Britton, sp. nov.

A tree, up to 15 m. high, the trunk up to 1 m. in diameter, the twigs stout, glabrous. Ocreae subtruncate, glabrous, 1–2 cm. long; petioles stout, 1–2 cm. long; leaf-blades coriaceous, glabrous, broadly ovate to suborbicular, 6–18 cm. long, strongly reticulate-veined on both sides, obtuse or rounded at the apex, obtuse to cordate at the base; spikes terminal, rather stout, glabrous, mostly much longer than the leaves, sometimes 3 dm. long, the nodes 1-flowered; bracts ovate, short; ocreolae about 2 mm. long; flowers sessile; calyx about 4 mm. broad, the sepals acutish; immature fruit subglobose, about 3 mm. in diameter, crowned by the calyx.

Mountain forests at middle and higher elevations, Porto Rico. Type from Loma Icao, Sierra de Naguabo (*Shaffer 3448*). Endemic. Erroneously included by Lindau in *C. Urbaniana* Lindau, of Trinidad. ORTEGON.

4. **Coccolobis diversifolia** Jacq. Enum. 19. 1760.

Coccoloba barbadensis Jacq. Enum. 37. 7160.

A tree, up to 10 or 12 m. high, the bark gray, separating in small scales, the twigs glabrous or nearly so. Leaf-blades ovate to elliptic or elliptic-obovate, coriaceous, glabrous, 4–10 cm. long, rounded or obtuse at the apex, obtuse, subcordate, rounded or some of them narrowed at the base, reticulate-veined on both sides, the rather stout petioles 8–20 mm. long; ocreae appressed, as long as the petioles or shorter; inflorescence spicate, slender, longer than the leaves; rachis puberulent, or glabrate; flowers green, very nearly sessile, 2–2.5 mm. long; fruit ovoid, pointed, 6–10 mm. long, coronate, the pericarp slightly fleshy. [*C. coronata* of Millspaugh; *C. punctata* of Krebs and of Eggers.]

Woodlands and hillsides at lower and middle elevations in moist districts, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda:—Bahamas; Jamaica; Cuba; Hispaniola; Antigua to Barbados; Aruba; Curaçao; Bonaire. MOUNTAIN GRAPE. RED-WOOD.

5. *Coccolobis obtusifolia* Jacq. Enum. 19. 1760.

Coccoloba microstachya Willd. Sp. Pl. 2: 459. 1799.

Coccoloba parvifolia Poir. in Lam. Encycl. 6: 64. 1804.

Coccoloba Klotzschiana Meisn. in DC. Prodr. 14: 155. 1856.

C. microstachya ovalifolia and *lanceolata* Meisn. in DC. Prodr. 14: 162. 1856.

C. microstachya rotundifolia Urban; Lindau, Bot. Jahrb. 13: 147. 1890.

A shrub, or a tree up to 8 m. in height, the twigs slender, puberulent or glabrate. Ocreae thin, about 5 mm. long, appressed; petioles 4–6 mm. long; leaf-blades chartaceous, various, lanceolate to oval, ovate or suborbicular, reticulate-veined on both sides, glabrous or nearly so, 3–8 cm. long (longer on shoots) the apex obtuse, rounded, acute or acuminate, the base mostly rounded or subcordate; spikes terminal, very slender, about as long as the leaves or a little longer, the nodes 1-flowered; bracts puberulent, acute; rachis puberulent; ocreolae 0.5 mm. long, equalling the bracts; fruit ovoid, black, about 5 mm. long. [*C. punctata microstachya* of Eggers; *C. punctata parvifolia* of Millspaugh.]

Hillsides and thickets at lower elevations, Porto Rico, mostly in dry districts; Culebra; Vieques; Mona; St. Thomas; St. Jan; St. Croix; Tortola; Virgin Gorda; Hispaniola. Recorded from the Bahamas, apparently erroneously. PUCKHOUT.

6. *Coccolobis uvifera* (L.) Jacq. Enum. 19. 1760.

Polygonum uvifera L. Sp. Pl. 365. 1753.

Coccoloba leoganensis Jacq. Enum. 19. 1760.

A tree, exceptionally up to 15 m. high, with a trunk 1 m. in diameter, usually not over 6 m. high, the branches spreading, the smooth bark brown, the twigs stout, finely pubescent when young, soon glabrous. Leaf-blades orbicular or broader than long, coriaceous, 7–20 cm. broad, cordate at the base, very short-petioled, their sheaths 1 cm. long or less; flowers numerous, white, in dense narrow glabrous racemes 7–12 cm. long; pedicels 3–4 mm. long; calyx white, about 6 mm. broad, its lobes ovate, rounded; fruits forming drooping clusters somewhat resembling bunches of grapes, globose, purple, 1–2 cm. in diameter, the pulp thin, astringent.

Coastal thickets and hillsides near the coasts, Porto Rico; Icacos; Culebra; Vieques; Mona; Desecheo; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—Florida; Bermuda; West Indies; continental tropical America. The heavy, hard, dark brown wood has a specific gravity of about 0.96; it is used for furniture and in cabinet work. SEA GRAPE. UVA DE MAR.

7. *Coccolobis Sintenisii* Urban; Lindau, Bot. Jahrb. 13: 157. 1890.

A tree, 6 m. high or higher, the stout twigs glabrous. Ocreae glabrous, 1–2 cm. long; leaf-blades coriaceous, glabrous, broadly ovate, 11–25 cm. long, pinnately few-veined, shining and not reticulate-veined above, dull and finely punctate-reticulate beneath, the apex bluntly short-acuminate, the base cordate, the stout petioles 2–3 cm. long; racemes apparently borne on lateral twigs, sessile, rather densely many-flowered, 12 cm. long or less, the rachis glabrous, the nodes 1-flowered; bracts ovate, rounded, about 1 mm. long, equalling the ocreolae; flowering pedicels 5–6 mm. long; calyx red, about 3 mm. long; fruiting pedicels filiform, 8–10 mm. long; fruit ovoid, red, coronate, about 8 mm. long.

Forests of the western mountains of Porto Rico, and, apparently, in arroyos near Coamo Springs. The Coamo Springs specimen is barren. Endemic. UVERO DE MONTE.

8. *Coccolobis laurifolia* Jacq. Hort. Schoen. 3: 9. 1797.

Coccoloba umbilicata Sessé & Moc. Fl. Mex. ed. 2, 96. 1894.

A tree, up to 20 m. high, with a trunk sometimes 7 dm. thick, usually much smaller, and often shrubby, the thin gray bark brown mottled, the twigs and leaves glabrous. Leaves ovate, elliptic or obovate, coriaceous, obtuse or acute-

at the apex, rounded at the base, 4–12 cm. long, or those of young shoots larger, the petioles 5–20 mm. long, the sheaths short; racemes slender, 5–10 cm. long; pedicels 5–8 mm. long; calyx greenish, about 5 mm. broad, its lobes suborbicular; fruits subglobose, red, acid, 8–10 mm. in diameter.

Thickets and woodlands at lower elevations, Porto Rico, mostly in dry districts: Vieques; Mona; St. Croix:—Florida; Bahamas; Jamaica; Cuba; Hispaniola. The reddish brown wood is hard, very heavy, its specific gravity about 1.00. GLATEADO.

9. *Coccolobis grandifolia* Jacq. Enum. 19. 1760.

Coccoloba pubescens L. Sp. Pl. ed. 2, 523. 1762.

A tree, up to 25 m. high, the trunk simple or sparingly branched, the stout twigs densely brown-hirsute, the wood red, hard and durable. Ocreae 2–3 cm. long, split on one side; leaves suborbicular, or broader than long, immense, up to 1 m. in diameter, rounded, cordate, coarsely reticulate-veined, finely pubescent or becoming glabrate above, densely brown-pubescent beneath, the stout petiole only about 1 cm. long; racemes solitary, terminal, densely many-flowered, 4–7 dm. long, the rachis puberulent; bracts and ocreolae about 0.5 mm. long; nodes 1–3-flowered; pedicels 3–5 mm. long; calyx white, 2–3 mm. broad; fruit globose to ovoid, about 5 mm. in diameter.

Forests at middle and higher elevations in the western districts of Porto Rico:—Hispaniola; Barbuda; Antigua; Montserrat; Guadeloupe; Martinique; Barbados; Mexico and Guiana. The wood, valued for furniture and for construction, is dense and heavy. MORALON.

10. *Coccolobis rugosa* Desf. Cat. Hort. Paris ed. 3, 389. 1829.

Coccoloba macrophylla Desf. Tabl. 38. Hyponym. 1804.

A very slender tree, up to 15 m. high, the trunk only 6–10 cm. in diameter, nearly or quite unbranched, the very hard wood white, the young growth flattened, 2-edged, glabrous, ridged, stout, the bark light gray, fissured. Ocreae firm, truncate, up to 7 cm. long. Leaves sessile, cordate, clasping, thick-coriaceous and brittle, wrinkled, orbicular to obovate, obtuse, 3–6 dm. broad, glabrous on both sides, strongly veined, the veins impressed above, prominent beneath; racemes terminal, bright red or crimson, 3–6 dm. long, many-flowered, the stout rachis minutely puberulent; bracts and ocreolae about 1 mm. long; pedicels 5–13 mm. long, 2–8 together at the nodes; calyx about 3 mm. long, its lobes ovate; fruit ovoid to subglobose, orange-red, about 6 mm. long. [*C. latifolia* of Bello, and of Krebs, not of Lamarek.]

Woodlands, local in moist or wet districts, Porto Rico; St. Thomas (according to de Candolle). Not known on St. Thomas at the present time; it may have grown there before the forests were cut away. ORTEGON.

11. *Coccolobis venosa* L. Syst. ed. 10, 1007. 1759.

Coccoloba nivea Jacq. Enum. 19. 1760.

Coccoloba excoriata L. Sp. Pl. ed. 2, 542. 1762.

A tree, with maximum height of about 12 m., or sometimes shrubby, the twigs short, glabrous. Ocreae membranous, acuminate, about 1 cm. long or longer, deciduous; petioles 5–10 mm. long; leaf-blades thin-chartaceous, elliptic to obovate-elliptic, rather strongly pinnately veined, 8–20 cm. long (those of shoots larger), finely reticulate-veined on both sides, glabrous, the apex short-acuminate, the base narrowed or obtuse; racemes spike-like, terminal, solitary, nodding, 6–15 cm. long, the nodes several-flowered, the rachis glabrous; bracts triangular, about 1.5 mm. long, shorter than the 2-lobed ocreolae; pedicels about 1 mm. long; calyx yellowish-green; fruit at length white, trigonous, about 6 mm. long, the calyx-lobes accrescent.

Hillsides and thickets at lower and middle elevations in dry or moist districts, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; Tortola:—Jamaica; Hispaniola; St. Bart's to Trinidad. CHIGGERY GRAPE. CALAMBREÑA.

12. *Coccolobis rupicola* Urban, Symb. Ant. 6: 10. 1909.

This species is based upon a barren specimen collected by Sintenis in a rocky situation, also at Los Angeles, near Utuado; it has broadly ovate, rounded leaves 7-8 cm. long, glabrous and nearly sessile. Lindau (Bot. Jahrb. 13: 154) erroneously regarded it as the same as *C. verruculosa* Lindau of Hispaniola.

Coccolobis Swartzii Meisn. var. (?) *portoricensis* Meisn. in DC. Prodr. 14: 160. 1856.

This was briefly described by Meisner from an incomplete specimen preserved in the Candollean herbarium at Geneva, Switzerland, recorded as from the high mountains of Porto Rico, the name of the collector not cited. Lindau, who had a drawing of the specimen, thought it might be related to *C. laurifolia*, or to *C. diversifolia* (*C. barbadosensis*), but could not associate any recently collected specimens with it (Bot. Jahrb. 13: 158).

Coccolobis costata C. Wright, of eastern Cuba, was recorded by Lindau as from Los Angeles, near Utuado, Porto Rico, after study of a barren specimen collected there by Sintenis (*No. 5934*); Urban, however, after subsequent study of the same material, concluded that it represented some other species (Symb. Ant. 4: 656).

Muehlenbeckia platyclada (F. v. M.) Lindau, CENTIPEDE PLANT, Polynesian, a shrub, up to about 3 m. in height, with flat narrow jointed leafless branches, the small green flowers clustered at the nodes, is grown for interest in Porto Rico and Virgin Island gardens. [*Coccoloba platyclada* F. v. M.]

Fagopyrum Fagopyrum (L.) Karst., BUCKWHEAT, European or Asiatic, an annual herb with hastate leaves, the ocreae oblique, and racemose or panicle small white flowers, the achenes about 2 mm. long and twice as long as the calyx, has been cultivated in the Virgin Islands for its nutritious fruits, from which buckwheat flour is made. [*Polygonum Fagopyrum* L.; *Fagopyrum esculentum* Moench.]

Triplaris caracasana Cham., Venezuelan, seen in the collection of trees at the Agricultural Experiment Station, Mayaguez, forms a fine tree 10 m. high or higher, with large oblong short-petioled leaves, the dioecious small flowers spicate, the 3 outer segments of the pistillate calyx elongating into narrow wing-like appendages.

Order 10. CHENOPODIALES.

Herbs or shrubs, rarely trees, mostly with perfect flowers. Calyx usually present. Corolla present or wanting. Ovary superior. Embryo coiled, curved or annular. Fruit a utricle, achene, berry, capsule or anthocarp, or aggregate, rarely achene-like.

Fruit not capsular, a utricle, berry, anthocarp or achene-like; corolla none.

Fruit a utricle.

Flowers bractless, or if bracted, the bracts not scarious, filaments usually free.

Flowers with scarious bracts, filaments united at least at the base.

Fruit not a utricle.

Fruit an anthocarp.

Fruit not an anthocarp.

Fruit aggregate.

Fruit not aggregate.

Fam. 1. CHENOPODIACEAE.

Fam. 2. AMARANTHACEAE.

Fam. 3. NYCTAGINACEAE.

Fam. 4. BATIDACEAE.

Fam. 5. PHYTOLACCACEAE.

Fruit a capsule, dehiscent by valves or teeth.

Capsule 2-several-celled; corolla none.

Capsule 1-celled; petals mostly present.

Sepals 5 or 4.

Sepals only 2.

Plants never with twining stems; ovules 2 to many.

Vines; ovule 1.

Fam. 6. AIZOACEAE.

Fam. 7. ALSINACEAE.

Fam. 8. PORTULACACEAE.

Fam. 9. BASELLACEAE.

Family 1. CHENOPODIACEAE Dumort.

GOOSEFOOT FAMILY.

Annual or perennial herbs, rarely shrubs, with angled striate or terete stems. Leaves alternate or sometimes opposite, estipulate, simple, entire, toothed or lobed, mostly petioled (in *Salicornia* reduced to mere scales). Flowers small, green or greenish, regular or slightly irregular, variously clustered, occasionally solitary in the axils. Petals none. Calyx persistent, 2-5-lobed, 2-5-parted or rarely reduced to a single sepal, wanting in the pistillate flowers of some genera. Stamens as many as the lobes or divisions of the calyx, or fewer, and opposite them, filaments slender; anthers 2-celled, longitudinally dehiscent. Disk usually none. Ovary 1-celled; ovules solitary, amphitropous; styles 1-3; stigmas capitate, or 2-3-lobed or divided. Fruit a utricle, with a thin or coriaceous pericarp. Seed vertical or horizontal; endosperm mealy, fleshy or wanting. About 75 genera and 550 species, of wide geographic distribution.

Embryo annular or conduplicate, neither spiral nor coiled.

Stem leafy, not jointed; flowers in clusters or spikes.

Flowers mostly perfect, ebracteolate.

Flowers mostly unisexual, the pistillate ones bracteolate.

Stem leafless, jointed; flowers sunken in cavities of the joints.

Embryo spirally coiled.

1. *Chenopodium*.

2. *Atriplex*.

3. *Salicornia*.

4. *Dandia*.

1. CHENOPODIUM L. Sp. Pl. 218. 1753.

Annual or perennial herbs, with alternate petioled leaves. Flowers small, green, perfect, sessile, bractless, clustered. Calyx 2-5-parted or 2-5-lobed, embracing or enclosing the utricle, its segments or lobes often keeled or ridged. Stamens 1-5; filaments filiform or slender. Styles 2 or 3; seed horizontal or vertical; endosperm mealy; embryo completely or incompletely annular. [Greek, goosefoot, from the shape of the leaves.] About 60 species, mostly weeds, of wide geographic distribution. Type species: *Chenopodium rubrum* L.

Embryo a complete ring; plant not aromatic.

Embryo horseshoe-shaped; plant aromatic.

1. *C. murale*.

2. *C. ambrosioides*.

1. *Chenopodium murale* L. Sp. Pl. 219. 1753.

Annual, somewhat scurfy above; stem 3-8 dm. high, leafy to the summit. Leaves rhombic-ovate, thin, bright green, acute or acuminate, sharply and coarsely sinuate-dentate, cuneate or subtruncate at the base, slender-petioled, 5-10 cm. long; flowers in loose axillary panicles often not longer than the petioles; calyx-segments not entirely enclosing the utricle; seed sharp-edged, horizontal, 1.2-1.5 mm. broad, dull, firmly attached to the pericarp; embryo a complete ring.

Waste and cultivated grounds at lower elevations, Porto Rico; St. Croix; St. Thomas:—widely distributed as a weed in temperate and tropical regions. Native of the Old World. Mistaken by Cook and Collins for *Chenopodium album* L. SOWBANE.

2. **Chenopodium ambrosioides** L. Sp. Pl. 219. 1753.

Chenopodium anthelminticum L. Sp. Pl. 220. 1753.

? *Chenopodium cuneifolium* Vahl in West, St. Croix 278. Hyponym. 1793.

Chenopodium spathulatum Sieb.; Moq. in DC. Prodr. 13^o: 73. 1849.

Annual, glabrous or slightly glandular-pubescent, strong-scented; stem leafy, 6–10 dm. high, angular and grooved. Leaves oblong or oblong-lanceolate, narrowed to a short petiole, repand-dentate, undulate or the upper entire, 2–9 cm. long, the upper numerous and much smaller; flowers in small dense axillary spikes; calyx usually 3-parted, completely enclosing the fruit; pericarp readily separable from the horizontal or vertical, shining seed; embryo horseshoe-shaped.

Hillsides, waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—widely distributed in temperate and tropical regions both of the New World and the Old. Consists of several races. WORMSEED. PASOTE.

2. **ATRIPLEX** L. Sp. Pl. 1052. 1753.

Herbs or low shrubs, often scurfy-canescens or silvery. Leaves alternate, or some of them opposite. Flowers dioecious or monoecious, small, green, in paniced spikes or capitate-clustered in the axils. Staminate flowers bractless, consisting of a 3–5-parted calyx and an equal number of stamens; filaments separate or united by their bases; a rudimentary ovary sometimes present. Pistillate flowers subtended by 2 bractlets which enlarge in fruit and are more or less united, sometimes quite to their summits; perianth none; stigmas 2. Utricle completely or partially enclosed by the fruiting bractlets. Seed vertical or rarely horizontal; embryo annular; endosperm mealy. [From a Greek name of orache.] About 150 species, of wide geographic distribution. Type species: *Atriplex hortensis* L.

1. **Atriplex pentandra** (Jacq.) Standley, N. A. Fl. 21: 54. 1916.

Azyris pentandra Jacq. Sel. Stirp. Am. 244. 1763.

Atriplex cristata H. & B.; Willd. Sp. Pl. 4: 959. 1806.

Obione cristata Moq. Chenop. Enum. 73. 1840.

Annual or perennial, branched, the branches procumbent or ascending, 3–8 dm. long, scurfy when young, becoming glabrate. Leaves alternate, sessile or short-petioled, oblong to rhombic or obovate, 1–3 cm. long, obtuse or acute at the apex, mucronate, cuneate at the base, repand-dentate, undulate or the upper entire, white-scurfy beneath, green above; flowers monoecious, the staminate in dense short terminal spikes, the pistillate clustered in the axils; fruiting bracts cuneate-orbicular, about 3 mm. long, united only at the base, sharply dentate, the sides bearing 2 dentate crests or irregularly tubercled; seed brown.

Sandy sea-beaches, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix.—Florida; Bahamas; Cuba; Hispaniola; Jamaica; Curaçao; northern South America. CRESTED ATRIPLEX. GARBANCILLO.

Atriplex portulacoides L., of southern Europe and northern Africa, was listed by Krebs as found in St. Thomas, evidently in error [*Obione portulacoides* Moq.].

3. **SALICORNIA** L. Sp. Pl. 3. 1753.

Succulent glabrous herbs, with opposite jointed branches, the leaves reduced to mere opposite scales, the flowers sunken 3–7 together in the axils of the upper ones forming narrow terminal spikes, perfect or the lateral ones staminate. Calyx obpyramidal or rhomboid, fleshy, 3–4-toothed or truncate, becoming spongy in

fruit, deciduous. Stamens 2, or sometimes solitary, exerted; filaments cylindrical, short; anthers oblong, large. Ovary ovoid; styles or stigmas 2. Utricles enclosed by the spongy fruiting calyx, the pericarp membranous. Seed erect, compressed; embryo conduplicate; endosperm none. [Name Greek, salt-horn; from the saline habitat, and horn-like branches.] About 10 species, growing in saline soil, widely distributed in both the Old World and the New, known as GLASSWORT. Type species: *Salicornia europaea* L.

Perennial; prostrate with erect branches.
Annual; erect.

1. *S. perennis*
2. *S. Bigelovii*

1. **Salicornia perennis** Mill. Gard. Dict. ed. 8, no. 2. 1768.

Salicornia ambigua Michx. Fl. Bor. Am. 1: 2. 1803.

Perennial by a woody rootstock; stem trailing or decumbent, 1.5–6 dm. long, rooting, the branches ascending or erect, slender, nearly or quite simple, rather long-jointed. Scales broadly ovate or wider than high, appressed or slightly divergent; fruiting spikes 1–4 cm. long, their joints not longer than thick; flowers all about equally high and about equalling the joints; seeds covered with slender hairs.

Saline soil. St. Croix; Anegada:—Atlantic and Gulf coasts of North America; Bermuda; Bahamas; Cuba; Jamaica; European coasts.

2. **Salicornia Bigelovii** Torr. Bot. Mex. Bound. Surv. 184. 1859.

Salicornia mucronata Bigelow, Fl. Bost. ed. 2, 2: 1824. Not Lag. 1817.

Annual, stout, erect or nearly so, 5–50 cm. tall, more or less branched, the branches stout. Scales ovate or triangular-ovate, sharply mucronate, 2–3 mm. long, at length spreading; fruiting spikes 1–12 cm. long, their joints not longer than thick; middle flowers slightly higher than the lateral ones, reaching very nearly to the end of the joint; seed covered with short hairs.

Sea coast at Salinas de Cabo Rojo, Porto Rico:—Atlantic and Gulf coasts of North America; California; Bahamas; Cuba; Yucatan. Erroneously recorded by Urban as *Salicornia herbacea* L.

4. **DONDIA** Adans. Fam. Pl. 2: 261. 1763.

Annual or perennial fleshy herbs or low shrubs, with alternate narrowly linear, thick or nearly terete, entire sessile leaves, and perfect or polygamous, bracteolate flowers, solitary or clustered in the upper axils. Calyx 5-parted or 5-cleft, the segments in fruit enclosing the utricle. Stamens 5. Styles usually 2, short. Pericarp separating from the seed. Embryo coiled into a flat spiral. Endosperm wanting or very little. [In honor of Jacopodi Dondi, Italian naturalist of the fourteenth century.] About 50 species, of wide geographic distribution. Type species: *Chenopodium altissimum* L.

2. **Dondia fruticosa** (L.) Northrop, Mem. Torr. Club. 12: 35. 1902.

Chenopodium fruticosum L. Sp. Pl. 221. 1753.

Perennial, woody, glabrous, or nearly so, somewhat glaucous, much branched, 8 dm. high or less, the branches leafy, ascending. Leaves subterete, 1–1.5 cm. long, the upper little shorter than the lower; calyx lobes rounded on the back, inflexed; seed red-brown or black, 1 mm. broad.

Saline soil, Virgin Gorda:—western United States; Bahamas; Cuba; widely distributed in the Old World.

Beta vulgaris L., REMOLACHA, BEET, European, cultivated in Porto Rico and the Virgin Islands, has a large fleshy red root, ovate leaves, the blade decurrent on the petiole, the small flowers glomerate-spicate, the glomerules subtended by bracts.

Family 2. **AMARANTHACEAE** J. St. Hil.

AMARANTH FAMILY.

Herbs, or a few genera low shrubs, with simple, mostly entire, thin leaves. Flowers small, green or white, bracteolate, variously clustered, usually in terminal spikes or axillary heads. Petals none. Calyx herbaceous or membranous, 2-5-parted, the segments distinct, or united at the base, equal, or the inner ones smaller. Stamens 1-5, mostly opposite the calyx-segments, hypogynous, filaments distinct, united at the base, or into a tube. Ovary 1-celled; ovule solitary in the majority of genera, amphitropous, several in some tropical genera; stigmas 1-3. Fruit a utricle, circumscissile, bursting irregularly, or indehiscent, 1-seeded or several-seeded. Seed mostly smooth; embryo annular; endosperm mealy, usually copious. About 40 genera and 475 species, widely distributed, most abundant in warm regions.

Ovules 2 or more.	1. <i>Celosia</i> .
Ovule solitary.	
Anthers 4-celled.	
Seed erect.	
Flowers mostly perfect; filaments united below; vines.	2. <i>Chamissoa</i> .
Flowers imperfect or polygamous; herbs.	3. <i>Amaranthus</i> .
Seed inverted.	4. <i>Centrostachys</i> .
Anthers 2-celled.	
Stigma capitate.	5. <i>Achyranthes</i> .
Stigma 2-3-lobed.	
Lobes of the stamen-tube 3-lobed.	6. <i>Gomphrena</i> .
Lobes of the stamen-tube entire.	
Flowers not flattened, borne in slender paniced spikes.	7. <i>Iresine</i> .
Flowers much flattened, in dense spikes or heads.	
Stamens 2.	8. <i>Lithophila</i> .
Stamens 5.	9. <i>Phloxeris</i> .

1. **CELOSIA** L. Sp. Pl. 1753.

Herbs or shrubs, with alternate leaves, the small perfect bracted flowers in spikes or fascicles. Perianth 5-parted, the segments scarious, striate. Stamens 5; filaments filiform or subulate, connate at the base; anthers 4-celled. Ovary 2-many-ovuled; style present or wanting; stigmas 2 or 3. Utricle circumscissile or irregularly rupturing. Seeds 2 to many, lenticular, shining; embryo annular, endosperm starchy. [Greek, burned, from the dry parched flowers of some species.] About 40 species, of tropical and subtropical distribution. Type-species: *Celosia argentea* L.

Perennial; inflorescence of paniced slender spikes; sepals dark brown.	
Seeds up to 20; leaf-blades short-decurrent on the petiole.	1. <i>C. nitida</i> .
Seeds 5 to 8; leaf-blades long-decurrent.	2. <i>C. virgata</i> .
Annual; inflorescence of simple stout spikes; sepals bright white.	3. <i>C. argentea</i> .

1. **Celosia nitida** Vahl, Symb. 2: 44. 1791.

Perennial; glabrous. Stem slender, erect or vine-like, 3-15 dm. long; petioles slender, 5-20 mm. long; leaf-blades ovate to rhombic-lanceolate, 2-7 cm. long, obtuse, acute or acuminate at the apex, truncate or obtuse and often oblique at the base; inflorescence of paniced spikes 1-5 cm. long; bracts nearly half as long as the sepals, ovate to lanceolate, keeled, acuminate; sepals elliptic-

lanceolate, about 5 mm. long, acuminate, dark brown, strongly parallel-veined; style short; utricle globose-ovoid, shorter than the calyx; seeds about 20, black, smooth. [*Celosia paniculata* of Krebs, not of Linnaeus.]

Thickets at lower elevations, especially along the coasts; Porto Rico; Desecheo; Mona; Muertos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida; West Indies; Mexico and northern South America. ALBAHACA.

2. *Celosia virgata* Jacq. Coll. 2: 279. 1788.

Perennial; glabrous. Stem erect, little branched or simple, somewhat woody below, 1 m. high or less; leaf-blades ovate or elliptic to lanceolate, 4–15 cm. long, the apex acuminate or acute, the base narrowed, long-decurrent on the petiole; spikes 1–5 cm. long, paniced; bracts one-third to one-half as long as the sepals, ovate to lanceolate, keeled, abruptly tipped; sepals ovate to lanceolate, about 6 mm. long, dark brown, acuminate, strongly parallel-veined; style much shorter than the globose-ovoid utricle; seeds 5–8, smooth, black.

Thicket, Cerro Ventana, Vieques.—Cuba; Mexico and northern South America.

3. *Celosia argentea* L. Sp. Pl. 205. 1753.

Annual; glabrous. Stem rather stout, erect, simple or branched, 1 m. high or less; petioles margined, 1–3 cm. long; leaf-blades linear to ovate, 4–12 cm. long, acute or acuminate at the apex, narrowed or rounded at the base; spikes solitary, dense, oblong or cylindric, up to 2 dm. long and 2 cm. thick; bracts ovate to lanceolate, about half as long as the bright white sepals; style slender; utricle subglobose; seeds black, shining.

Moist waste grounds at lower elevations. Porto Rico; St. Croix; St. Thomas.—Jamaica; Cuba; Hispaniola; St. Martin to Grenada; continental tropical America and Old World tropics; often planted for ornament in gardens. SILVERY CELOSIA.

Celosia cristata L., COCKSCOMB, planted for ornament in Porto Rico and Virgin Island gardens, has ovate leaves, the spikes variously crested and branched, red, purple, crimson or white.

2. **CHAMISSOA** H.B.K. Nov. Gen. 2: 196. 1817.

Perennial, herbaceous or slightly woody vines, or sometimes suffrutescent, with broad alternate petioled leaves, the perfect or polygamous flowers in terminal and axillary, simple or branched spikes. Bracts usually 3. Sepals 5, persistent. Stamens 5, the subulate filaments connate at the base; anthers ovoid, 4-celled; staminodes none. Utricle circumscissile at or below the middle. Seed reniform-lenticular, erect, arillate, the embryo annular. [Commemorates Louis Charles Adelbert de Chamisso, 1791–1838, distinguished naturalist.] A few species, of tropical America, the following typical.

1. *Chamissoa altissima* (Jacq.) H.B.K. Nov. Gen. 2: 197. 1817.

Achyranthes altissima Jacq. Enum. 17. 1760.

Celosia paniculata L. Sp. Pl. ed. 2, 298. 1762.

Kokera paniculata Kuntze, Rev. Gen. Pl. 542. 1891.

Glabrous or nearly so, clambering on shrubs or trees, slender, branched, up to 5 m. long, woody below. Petioles slender, 1–3.5 cm. long; leaf-blades thin, ovate to ovate-lanceolate or oval, 6–18 cm. long, the apex acuminate or acute, the base narrowed or subtruncate; spikes densely or loosely flowered, 2 dm. long or less, those of staminate flowers more slender than the pistillate; bracts about

one-half as long as the sepals; sepals 3–4 mm. long, green; utricle globose to ovoid, about as long as the sepals; seed black.

Thickets and woodlands at lower and middle elevations in moist and dry districts, Porto Rico, ascending to 900 m.: St. Croix; St. Thomas.—Jamaica; Cuba; Hispaniola; Saba; Martinique; Grenada; Trinidad; continental tropical America.

3. *AMARANTHUS* L. Sp. Pl. 989. 1753.

Annual branched, erect or diffusely spreading, glabrous or pubescent herbs, with petioled, pinnately veined leaves and small monoecious polygamous or dioecious, green or purplish, mostly 3-bracteolate flowers in dense terminal spikes or axillary clusters. Calyx of 1–5 distinct sepals. Stamens 1–5; anthers longitudinally dehiscent. Styles or stigmas 2 or 3. Fruit on ovoid or oblong utricle, 1-seeded, 2–3-beaked by the styles. Embryo annular. [Greek, unfading flower, from the dry, unwithering bracts.] About 60 species of wide geographic distribution, known as *BLEDO* and *AMARANTH*. Type species: *Amaranthus caudatus* L.

Flowers all axillary; sepals of pistillate flowers spatulate.

Peduncle short and thick; utricle indehiscent.

Peduncle none; utricle circumscissile.

Staminate flowers mostly in terminal spikes; sepals of pistillate flowers oblong or obovate.

Utricle indehiscent.

Utricle smooth.

Utricle wrinkled.

Utricle circumscissile or bursting irregularly.

Leaf axils with a pair of spines.

Plants not spiny.

1. *A. crassipes*.

2. *A. polygonoides*.

3. *A. viridis*.

4. *A. gracilis*.

5. *A. spinosus*.

6. *A. dubius*.

1. *Amaranthus crassipes* Schlecht. *Linnaea* 6: 757. 1831.

Scleropus amaranthoides Schrad. *Ind. Sem. Hort. Goetting.* 1835.

Glabrous; stems prostrate or somewhat ascending, rather fleshy, 2–6 dm. long. Petioles slender, 0.5–4 cm. long; leaves ovate to oblong or obovate, 0.5–3.5 cm. long, prominently whitish-veined, rounded and emarginate at the apex, narrowed at the base; flowers monoecious, in dense short-peduncled axillary clusters, the peduncles thickened; bracts very small, ovate, acutish; sepals of the pistillate flowers 4 or 5, spatulate, scarious, about 1.5 mm. long, obtuse or emarginate; style-branches 2; utricle obovoid, compressed, coriaceous, finely tuberculate, indehiscent; seed dark brown or black, smooth, about 1 mm. broad.

Waste and cultivated grounds at lower elevations in dry districts, Porto Rico; Muertos; Vieques; Culebra; St. Croix (type locality); St. Thomas; Tortola; Virgin Gorda.—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Margarita; Aruba; Curaçao; northern South America.

2. *Amaranthus polygonoides* L. *Pl. Jam. Pug.* 2: 27. 1759.

Amblogyna polygonoides Raf. *Fl. Tell.* 3: 42. 1836.

Stems slender, prostrate or ascending, much branched, 1–5 dm. long, villous above. Petioles 2–7 mm. long; leaves 0.5–2 cm. long, rhombic-ovate to obovate, obtuse and usually emarginate at the apex, narrowed or cuneate at the base, glabrous, or sparingly pubescent beneath; flowers monoecious, in sessile dense axillary small clusters; bracts lanceolate, acuminate, much shorter than the sepals; sepals of the pistillate flowers spatulate, obtuse or apiculate, white, scarious, 3-nerved, connate at the base, those of the staminate flowers oblong, acute; stamens and style-branches 2 or 3, utricle circumscissile; seed dark brown or black, shining, less than 1 mm. broad.

Sandy soil and waste grounds, St. Croix; St. Thomas.—Florida; Bahamas; Cuba; Hispaniola; St. Martin; St. Bart's; Saba; Antigua; Martinique; Aruba; Curaçao; Texas and Mexico to northern South America.

3. *Amaranthus viridis* L. Sp. Pl. ed. 2, 1405. 1763.

Euxolus viridis Moq. in DC. Prodr. 13²: 273. 1849.

Amaranthus emarginatus Salzm.; Uline & Bray, Bot. Gaz. 19: 319. 1894.

Stems slender, prostrate or ascending, glabrous, usually branched, 1–6 dm. long. Leaves slender-petioled, rhombic-ovate, 1–4 cm. long, glabrous, deeply emarginate at the apex, rounded or narrowed at the base; flowers monoecious, in small axillary clusters and usually also in a short terminal spike; bracts ovate to lanceolate, acute, as long as the sepals or shorter; sepals 3, those of the pistillate flowers oblong or oblong-oblancheolate, obtuse or shorter than the utricle, those of the staminate flowers oblong, acute; stamens and style-branches 3; utricle smooth, indehiscent; seed reddish-brown, shining, nearly 1 mm. broad.

Waste grounds in moist districts, Porto Rico; Vieques; St. Thomas (according to Krebs);—southern United States; Cuba; Jamaica; Bahamas; Guadeloupe; tropical South America and Old World tropics.

4. *Amaranthus gracilis* Desf. Tabl. Bot. 43. 1804.

Chenopodium caudatum Jacq. Coll. 2: 325. 1788. Not *A. caudatus* L.

Euxolus caudatus Moq. in DC. Prodr. 13²: 274. 1849.

Glabrous; stem erect, usually branched, 2–9 dm. high. Leaves slender-petioled, 8 cm. long or less, ovate or rhombic-ovate, mostly obtuse and emarginate at the apex, narrowed or rounded at the base; flowers monoecious, in slender, axillary and terminal, sometimes paniced spikes 4–12 cm. long, and also often in small dense axillary clusters; bracts ovate to lanceolate, acute, scarious, much shorter than the 3 sepals; sepals cuspidate, 1–1.5 mm. long; stamens and style-branches 3; utricle wrinkled, indehiscent, as long as the sepals or longer; seed dull, dark brown, 1 mm. broad. [*Euxolus oleraceus* of Krebs and of Eggers; ? *Amaranthus oleraceus* of West.]

Waste and cultivated grounds, Porto Rico; Muertos; Culebra; St. Croix; St. Thomas; St. Jan.—southern United States; West Indies; tropical and subtropical continental America and Old World tropics. LUMBOO.

5. *Amaranthus spinosus* L. Sp. Pl. 991. 1753.

Stem stout, ridged, erect or ascending, glabrous below, somewhat pubescent above, usually much branched, sometimes red, 3–12 dm. high, with a pair of rigid stipular spines at each node. Leaves slender-petioled, rhombic-ovate or the upper lanceolate, acute at both ends, 2–8 cm. long, the midvein excurrent; flowers monoecious, the pistillate in numerous capitate axillary clusters, the staminate in dense terminal spreading or drooping spikes 2–18 cm. long; bracts lanceolate-subulate, about as long as or longer than the 5 scarious oblong mucronate-tipped 1-nerved sepals, and the thin imperfectly circumscissile utricle; stamens 5; style-branches 3; seed black, shining, nearly 1 mm. broad.

Waste and cultivated grounds, Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; Tortola; Virgin Gorda.—United States; West Indies; all temperate and tropical regions.

6. *Amaranthus dubius* Mart. Hort. Erlang. 197. 1814.

Amaranthus tristis Willd. Hist. Amar. 21. 1790. Not L. 1753.

Glabrous, or somewhat pubescent above; stem erect, often much branched, 1 m. high or less. Leaves long-petioled, the slender petiole 2–9 cm. long, the blade ovate, 2–12 cm. long, acute or obtuse and usually emarginate at the apex, rounded or acute at the base; flowers monoecious, in slender, often drooping, terminal and axillary spikes 5–25 cm. long, and sometimes in small dense axillary clusters; bracts ovate or elliptic, acute, shorter than or about as long as the sepals; sepals of the pistillate flowers 1.5–2 mm. long, mucronate, often emarginate, 1-nerved; stamens 5; style-branches 3; utricle a little longer than the sepals, rugu-

lose, dehiscent at the middle; seed dark brown or black, circular, sharp-edged, 1 mm. in diameter. [*A. paniculatus* of Eggers and of Millsbaugh.]

Waste and cultivated grounds, Porto Rico; Desecheo; Mona; Icaos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; Central and South America; tropical Africa; adventive in Europe. BOWER.

Amaranthus gangeticus L. [*A. incomptus* Willd.; *A. tricolor* L.] Planted for ornament in the Virgin Islands, perhaps also in Porto Rico, is erect, up to 1 m. high, with terminal, interrupted spikes. It is a native of the Old World tropics.

Amaranthus caudatus L., a tall unarmed species, with nodding terminal stout spikes, the sepals of the pistillate flowers obovate or spatulate, was recorded by West, many years ago, as found on St. Croix; it is occasionally cultivated as a garden plant, but is not known to us to exist in a wild state within the limits of this Flora.

Amaranthus cruentus L. [*A. paniculatus* L.], also a tall unarmed species, with erect terminal panicle red or purple spikes, the pistillate sepals short, oblong, obtuse, is grown for ornament in Porto Rico and Virgin Island gardens. CATERPILLAR.

4. **CENTROSTACHYS** Wall. in Roxb. Fl. Ind. 2: 497. 1824.

Herbs, some species somewhat woody, with opposite membranous broad leaves, and small perfect green flowers, sessile in slender elongated terminal spikes, the calyx deflexed after anthesis. Sepals 4 or 5, cartilaginous, narrow, acuminate or aristate. Stamens 4 or 5; filaments subulate; anthers 4-celled. Ovary 1-celled; ovule 1; style filiform; stigma capitate. Utricle thin-walled, indehiscent. [Greek, prickly-spike.] About 12 species, of warm and tropical regions. Type species: *Centrostachys aquatica* Wall.

Leaves suborbicular to obovate, abruptly tipped; sepals about 4 mm. long. 1. *C. indica*.
Leaves oval to ovate, acuminate; sepals 6–7 mm. long. 2. *C. aspera*.

1. **Centrostachys indica** (L.) Standley, Journ. Wash. Acad. Sci. 5: 75. 1915.

Achyranthes aspera indica L. Sp. Pl. 204. 1753.

Achyranthes indica Mill. Gard. Dict. ed. 8, no. 2. 1768.

Achyranthes obtusifolia Lam. Encycl. 1: 545. 1785.

Achyranthes aspera obtusifolia Griseb. Fl. Br. W. I. 62. 1859.

Annual, herbaceous, erect or ascending, simple or branched, 6–12 dm. high, rather densely pubescent above. Leaf-blades suborbicular or obovate-orbicular, pubescent, 2–7 cm. long, abruptly short-tipped, narrowed or cuneate at the base, the slender petioles 1–3 cm. long; spikes very slender, 2–6 dm. long, densely flowered above, the lower flowers scattered; flowers about 4 mm. long; bracts subulate-tipped, horny, glabrous, a little shorter than the calyx; sepals acuminate.

Waste and cultivated grounds, Porto Rico; Mona; Muertos; Vieques; Culebra; St. Croix; St. Thomas; Tortola:—tropical and subtropical regions. MAN-BETTER-MAN.

2. **Centrostachys aspera** (L.) Standley, Journ. Wash. Acad. Sci. 5: 75. 1915.

Achyranthes aspera L. Sp. Pl. 204. 1753.

Achyranthes argentea Lam. Encycl. 1: 545. 1785.

Annual or perennial, decumbent or ascending, usually few-branched, about 1 m. long or less, pilose. Leaf-blades oval or ovate, 4–20 cm. long, the apex

acuminate, the base rounded or narrowed, the petioles 2.5 cm. long or less; spikes slender, 3 dm. long or less, loosely flowered below, dense above; flowers 6-7 mm. long; bracts long-aristate; sepals acuminate, twice as long as the bracts.

Waste grounds near Mayaguez, Porto Rico; Virgin Islands (ex Eggers); Tortola:—Florida; Cuba; Hispaniola; Guadeloupe; Martinique; St. Vincent; Central America; Old World tropics.

5. **ACHYRANTHES** L. Sp. Pl. 204. 1753.

Mostly decumbent or prostrate herbs. Leaves opposite, entire or nearly so. Flowers perfect, in sessile or peduncled, head-like, usually white or silvery spikes. Sepals 5, unequal. Stamens 5, the filaments partially united into a cup-like tube; staminodia surpassing the filaments and 2-celled anthers, or shorter. Ovary 1-celled; stigma capitate. Ovule solitary. Utricle flattened, indehiscent. Seeds lenticular, smooth. [Greek, straw-flower.] Forty species or more, mostly of tropical distribution, known as **SANGUINARIA**. Type species: *Achyranthes repens* L.

Heads sessile.

Staminodia mostly shorter than the filaments, entire or denticulate; plants prostrate or procumbent.

Outer sepals aristate.

Sepals all acuminate or acute.

Sepals 4 mm. long, the utricles much shorter.

Sepals 2 mm. long or less, the utricles as long or longer.

Staminodia as long as the filaments or a little longer, laciniate.

Leaf-blades orbicular; bracts entire; plant prostrate.

Leaf-blades rhombic, obovate or oval.

Lower bracts laciniate-lobed.

Bracts entire.

Heads on elongated peduncles; plant erect or ascending.

1. *A. peploides*.
2. *A. polygonoides*.
3. *A. sessilis*.
4. *A. portoricensis*.
5. *A. Bettzickiana*.
6. *A. jicoidea*.
7. *A. ramosissima*.

1. **Achyranthes peploides** (H. & B.) Britton.

Illecebrum peploides H. & B.; R. & S. Syst. 5: 517. 1819.

Alternanthera repens Kuntze, Rev. Gen. Pl. 2: 540. 1891. Not *Achyranthes repens* L.

Loosely pilose, branched, the branches prostrate, 5 dm. long or less. Leaves spatulate, obovate, to oval or suborbicular, 2 cm. long or less, pinnately veined, obtuse or abruptly tipped, narrowed at the base into short petioles; flowers in dense sessile globose or oblong heads 6-12 mm. long; sepals dull whitish, unequal, about 2 mm. long, longer than the bracts, the outer aristate, villous; staminodia somewhat shorter than the filaments, entire, or few-toothed below; utricles ovoid, included. [*Illecebrum Achyrantha* of Krebs, not of Linnaeus; *Alternanthera Achyrantha* Griseb., not R. Br.]

Waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas:—southern United States; West Indies; continental tropical America; Atlantic Islands and Spain. **ARDOSNA JARDIN.**

2. **Achyranthes polygonoides** (L.) Lam. Encycl. 1: 547. 1785.

Gomphrena polygonoides L. Sp. Pl. 225. 1753.

Alternanthera polygonoides R. Br. Prodr. 1: 417. 1810.

Alternanthera paronychioides St. Hil. Voy. Bras. 2: 439. 1833.

Glabrous or sparingly pilose, branched, the branches procumbent or creeping, 1-6 dm. long. Leaves spatulate to elliptic, 2 cm. long or less, obscurely veined, acute or obtuse at the apex, narrowed at the base, the petioles 5-10 mm. long; flowers in dense sessile globose axillary heads 8-12 mm. in diameter; sepals bright white, shining, lanceolate, acute, slightly unequal, about 3 mm. long, somewhat longer than the lanceolate bracts; staminodia about as long as the

filaments, toothed to the apex; utricle obovate, included. [*Alternanthera ficoidea* of Bello].

Fields, banks and waste grounds, Porto Rico, especially in sandy soil, at lower elevations; St. Thomas;—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Martinique; Barbados; continental tropical America.

3. ***Achyranthes sessilis* (L.) Steud.**; Standley, Journ. Wash. Acad. **5**: 73. 1915.

Gomphrena sessilis L. Sp. Pl. 225. 1753.

Alternanthera sessilis R. Br. Prodr. 417. 1810.

Branched, the branches slender, prostrate, glabrous or with a line of hairs on one side, often rooting at the nodes. Leaf-blades elliptic to spatulate, 1–5 cm. long, rounded or short-acuminate at the apex, narrowed or cuneate at the base, glabrous, or sparingly villous beneath, the petioles only 1–4 mm. long; heads subglobose, axillary, white, a little longer than the petioles; sepals ovate, acute, about twice as long as the bracts; staminodia about as long as the filaments, entire; utricle about as long as the calyx, obovate.

Fields, waste and cultivated grounds, Porto Rico, especially in moist sandy soil at lower elevations; St. Thomas (according to Krebs);—Hispaniola; St. Kitts to Trinidad; continental tropical America and Old World tropics.

4. ***Achyranthes portoricensis* (Kuntze) Standley**, Journ. Wash. Acad. **5**: 73. 1915.

Alternanthera portoricensis Kuntze, Rev. Gen. Pl. 540. 1891.

Telanthera Sintenisii Urban, Symb. Ant. **1**: 301. 1899.

Telanthera dolichocephala Urban, Symb. Ant. **1**: 302. 1899.

Alternanthera eulebrasensis Uline, Field Mus. Bot. **1**: 420. 1899.

Alternanthera Sintenisii Uline, Field Mus. Bot. **1**: 421. 1899.

Alternanthera dolichocephala Urban, Symb. Ant. **4**: 221. 1905.

Perennial, branched, prostrate, the branches slender, up to 1 m. long, white-villous or in age glabrate. Leaf-blades orbicular to broadly oval, 5 cm. long or less, thin, rounded at base and apex, pilose or becoming glabrate, the petioles 3–10 mm. long; heads axillary, sessile, white; sepals oblong-lanceolate, acuminate, 3-nerved, pilose, about twice as long as the ovate acuminate bracts; staminodia as long as the filaments or a little longer, lacinate.

Sandy and rocky soil at lower and middle altitudes, southern and southwestern dry districts, Porto Rico; Culebra; Little St. James Island; St. Croix; Anegada. Endemic.

5. ***Achyranthes Bettzickiana* (Regel) Standley**, N. A. Fl. **21**: 138. 1917.

Telanthera Bettzickiana Regel, Gartenflora **11**: 178. 1862.

Perennial or flowering as an annual, green or purplish red, erect or ascending, 1–4 dm. high, branched, villous when young, soon glabrate, the nodes swollen. Leaf-blades rhombic or obovate, 4 cm. long or less, the apex acuminate or abruptly acute, the base long-attenuate, the petioles as long or shorter; heads axillary, sessile, whitish, shorter than the petioles; sepals oblong-lanceolate, acute or acuminate, twice as long as the lacinate-lobed lower bracts; staminodia lacinate, as long as the filaments; utricle ovoid.

Locally escaped from cultivation in Porto Rico. Widely planted for ornament in tropical America. Probably native of Brazil. JAMON CON HUEVOS.

6. ***Achyranthes ficoidea* (L.) Lam.** Encycl. **1**: 548. 1785.

Gomphrena ficoidea L. Sp. Pl. 225. 1753.

Telanthera ficoidea Moq. in DC. Prodr. **13**²: 364. 1849.

Perennial, short-pubescent or becoming glabrate, prostrate or ascending, 2–10 dm. long, simple or branched, rooting at the lower nodes. Leaf-blades

oblong to ovate-oblong, rather thick, 5.5 cm. long or less, obtuse or acute, the base narrowed, the petioles 2–7 mm. long; heads axillary, sessile, solitary or 2 or 3 together, subglobose, longer than the petioles, yellowish white; sepals oblong to ovate, acuminate, twice as long as the ovate, spinulose-tipped bracts; staminodia as long as the filaments or longer; utricle suborbicular. [*Alternanthera polygonoides* of Grisebach, not of R. Brown.]

Moist situations, Mayaguez, Porto Rico; St. Thomas; Tortola.—Jamaica; Hispaniola; Cuba; Dominica to Trinidad and continental tropical America.

Achyranthes halimifolia Lam., related to *A. ficoidea*, but with leaves densely pubescent beneath, is recorded by Standley (N. A. Fl. 21: 140) as inhabiting the Danish West Indies, but this must be in error for Dutch West Indies, as the plant is not known to grow in the Virgin Islands but is abundant on Curaçao.

7. **Achyranthes ramosissima** (Mart.) Standley, Journ. Wash. Acad. 5: 74. 1915.

Mogiphanes ramosissima Mart. Nov. Gen. & Sp. 2: 36. 1826.

Perennial, sparingly strigose or glabrate; stems slender, branched, ascending, woody below, 1.5 m. long or less. Leaf-blades ovate to lanceolate, 2–8 cm. long, the apex acute or acuminate, the base rounded or narrowed, the petioles only 5 mm. long or less; peduncles straight, slender, 2–10 cm. long; spikes subglobose to cylindrical, 1–2.5 cm. long, white; sepals oblong, mucronate, 4–5 mm. long, about three times as long as the bracts; staminodia much longer than the filaments, the apex lacinate. [Erroneously recorded by Urban as *Alternanthera brasiliensis* and by Millspaugh as *Alternanthera straminea*.]

Coastal sands, San Juan, and near Bayamon, Porto Rico.—Florida; Grenada; St. Vincent; Trinidad; Yucatan; northeastern South America.

6. **GOMPHRENA** L. Sp. Pl. 224. 1753.

Pubescent, annual or perennial herbs, with opposite leaves, the perfect flowers in heads or spikes, white, yellow or red, the bractlets keeled, the keel often crested. Calyx 5-lobed or 5-parted. Stamens 5, the filaments united into a lobed tube, the anthers 2-celled. Stigma 2-lobed, the lobes recurved. Utricle flattened. Seed smooth, inverted. [An ancient name, derivation not stated.] Perhaps as many as 100 species, of tropical regions. Type species: *Gomphrena globosa* L.

Heads 20–25 mm. in diameter; annual.
Heads 9–13 mm. in diameter; perennial.

1. *G. globosa*.
2. *G. dispersa*.

1. **Gomphrena globosa** L. Sp. Pl. 224. 1753.

Annual, branched or sometimes simple, erect, 3–8 dm. high, appressed-pilose, the nodes swollen. Leaf-blades oblong to ovate or spatulate, 2–10 cm. long, the apex acute, the base narrowed or obtuse, the petioles 5–20 mm. long, the heads usually subtended by 2 or 3 much smaller leaves; heads solitary, subglobose, white, yellow or purple, 20–25 mm. in diameter; calyx woolly, shorter than the acute or acuminate bracts and bractlets; stamen-tube longer or shorter than the bractlets; style long.

Waste grounds, locally spontaneous after cultivation in Porto Rico; St. Croix; St. Thomas.—spontaneous after cultivation for ornament in tropical and subtropical regions. Frequently grown in Porto Rico and Virgin Island flower gardens. Native of tropical Asia. **GLOBE AMARANTH. BACHELOR'S BUTTON.**

2. *Gomphrena dispersa* Standley, Contr. U. S. Nat. Herb. 18: 91. 1916.

Perennial, ascending or prostrate, branched, appressed-pilose, the branches 2–30 cm. long. Leaf-blades oblong to obovate, 5 cm. long or less, acute or obtuse at the apex, narrowed at the base, the petioles 2–6 mm. long, the heads subtended by 2 or 3 similar somewhat smaller leaves; heads mostly solitary, white, subglobose to short-cylindric, 9–13 mm. in diameter; calyx woolly, about as long as the thin bractlets; stamen-tube short; style long.

Waste and cultivated grounds, vicinity of San Juan and Santurce, Porto Rico, apparently introduced:—Cuba; Jamaica; Mexico and Central America; adventive in Florida.

7. *IRESINE* P. Br. Hist. Jam. 358. 1756.

Tall or long herbs, with opposite petioled leaves and small 3-bracted white flowers, in large terminal panicles or paniced spikes. Calyx 5-parted, the pistillate usually woolly. Stamens 5, rarely fewer; filaments united by their bases, filiform; anthers 2-celled. Utricle very small, subglobose, indehiscent. [Greek, in allusion to the woolly pubescence.] About 40 species, natives of warm and temperate regions. Type species: *Celosia paniculata* L.

Flowers perfect; perennials.

Erect, herbaceous; glabrate.

Somewhat woody vine, the inflorescence densely tomentulose.

Flowers dioecious; erect or clambering, glabrate annual or perennial.

1. *I. angustifolia*.

2. *I. argentata*.

3. *I. Celosia*.

1. *Iresine angustifolia* Euph. Beskr. St. Bart. 165. 1795.

Iresine elatior Rich.; Willd. Sp. Pl. 4: 706. 1805.

Alternanthera linearis Bello, Anales Soc. Esp. Hist. Nat. 12: 107. 1883.

Perennial, erect, slender, branched, glabrate, 5–20 dm. long, the branches ascending. Leaf-blades ovate-lanceolate to linear-lanceolate, 5–10 cm. long, 0.5–4 cm. wide, the apex acuminate, the base narrowed, the slender petioles 2.5 cm. long or less, those of the inflorescence smaller; heads loosely paniced, brownish, subglobose or subcylindric, 5–12 mm. long, the peduncles and panicle branches very slender; flowers perfect; sepals oblong, acute, 1.5 mm. long, about as long as the bractlets; utricule orbicular.

Banks and thickets at lower and middle elevations, especially along the coasts and in dry districts, Porto Rico: Desecheo; Icacos; Culebra; Vieques; St. Croix; St. Thomas; Tortola:—Jamaica; Cuba; Hispaniola; St. Barts to Trinidad; continental tropical America.

2. *Iresine argentata* (Mart.) D. Dietr. Syn. Pl. 1: 870. 1839.

Trommosdorffia argentea Mart. Nov. Gen. & Sp. 2: 41. 1826.

Achyranthes nodosa Bert.; Mart. loc. cit., as synonym. 1826.

Alternanthera argentata Moq. in DC. Prodr. 13²: 352. 1849.

Gomphrena Berteriana Balb.; Griseb. Fl. Br. W. I. 707. 1864.

A somewhat woody, much branched vine, up to 7 m. long, the stems glabrate, slender, terete, the branches of the inflorescence densely tomentulose. Leaf-blades oval to ovate, glabrous or nearly so, 6–12 cm. long, the apex acute, the base cordate, the petioles 10 mm. long or less; heads very numerous, subglobose, sessile or short-stalked, 6–8 mm. in diameter, silvery; sepals pilose, acutish, 2 mm. long, about three times as long as the bractlets; staminodia short, entire; filaments filiform.

Thickets, woodlands, and banks at lower and middle elevations in moist districts, Porto Rico:—northern South America; recorded from Trinidad.

3. **Iresine Celosia** L. Syst. ed. 10, 1291. 1759.*Celosia paniculata* L. Sp. Pl. 206. 1753.*Iresine celosioides* L. Sp. Pl. ed. 2, 1456. 1763.*Iresine paniculata* Kuntze, Rev. Gen. Pl. 2: 542. 1891. Not Poir. 1813.

Annual or perennial; stem erect, ascending or clambering, 0.6–3 m. long, glabrous or nearly so. Leaves ovate, ovate-lanceolate or the upper lanceolate, 0.5–1.5 dm. long, acute or acuminate, the slender petioles 1–6 cm. long; flowers very numerous, 2 mm. broad or less; calyx and bracts silvery; sepals 1–1.5 mm. long; pistillate flowers white-villous at the base, about twice as long as the bracts; utricle shorter than the sepals; seed red, shining, 0.5 mm. in diameter.

Thickets, banks and woodlands, Porto Rico, at lower and middle elevations in moist districts:—Jamaica; Cuba; Hispaniola; Saba to Trinidad; continental tropical America.

Iresine Lindenii Van Houtte, recorded as from Ecuador, grown for ornament in Porto Rico and Virgin Island gardens, is tall, similar to *I. Celosia*, but with ovate acuminate purple leaves, the paniced inflorescence often very large, sometimes 3 or 4 dm. high.

Iresine Herbstii Hook., South American, also grown for ornament in Porto Rico and Virgin Island gardens, is similar, but the purple leaves are suborbicular, rounded, obtuse or notched, the inflorescence smaller.

Iresine interrupta Benth. [*Alternanthera Richardi* Moq.], a Mexican species, was recorded by Krebs as found in St. Thomas, evidently in error.

8. **LITHOPHILA** Sw. Prodr. 14. 1788.

Perennial, more or less villous herbs, the leaves mostly in basal tufts, the small perfect bracteolate flowers in spikes or heads. Calyx flattened, 5-parted, sessile. Stamens 2; filaments connate below; anthers 2-celled; staminodia 3. Ovary ovoid; style short; stigmas 2, slender; ovule 1, pendulous. Utricle ovoid, compressed. Seed lenticular, smooth. [Greek, rock-loving.] About 4 species, of the West Indies and Galapagos, the following typical.

1. **Lithophila muscoides** Sw. Prodr. 14. 1788.*Achyranthes linearifolia* Sw. Vet. Acad. Handl. 1825: 48. 1825.

Root woody, often deep; stems few or several, prostrate or ascending, villous, branched, 0.1–2 dm. long. Basal leaves several or many, tufted, filiform to oblong-spatulate, 1.5–5 cm. long, 0.3–5 mm. wide, obtuse, villous near the base; cauline leaves few, similar but smaller, glabrous; spikes 3–15 mm. long, about 5 mm. thick, solitary or clustered, terminal or axillary, sessile or nearly so; bracts white, membranous, ovate, acute or acuminate, about one-half as long as the sepals; bractlets similar, nearly as long as the sepals; sepals oblong, 1–2.5 mm. long, the outer obtuse, villous at the base, the inner acute; seed nearly orbicular, brown, shining, 0.5 mm. in diameter.

Near the coast, Arecibo; Porto Rico; Mona; St. Croix; Anegada:—Bahamas; Cuba; Hispaniola; St. Martin to Martinique; Bonaire; Curaçao; Aruba.

9. **PHILOXERUS** R. Br. Prodr. 416. 1810.

Herbs, mostly fleshy, with opposite entire leaves, the perfect bracteolate flowers in dense heads or short spikes. Calyx compressed, thickened at the base, 5-parted, the segments obtuse. Stamens 5; filaments subulate, connate below; anthers oblong, 2-celled. Ovary ovoid, compressed; style short; stigmas 2,

subulate; ovule suspended on a long funicle. Utricle compressed, ovoid, indehiscent. Seed lenticular; embryo annular; endosperm starchy. [Greek, dry-loving, some species inhabiting dry situations.] About 10 species of coastal distribution in tropical and subtropical America, Africa and Australasia. Type species: *Philoxerus conicus* R. Br.

1. **Philoxerus vermicularis** (L.) Nutt. Gen. 2: 78. 1818.

Gomphrena vermicularis L. Sp. Pl. 224. 1753.

Iresine vermicularis Moq. in DC. Prodr. 13²: 340. 1849.

Iresine crassifolia Moq. loc. cit. 1849.

Iresine aggregata Moq. loc. cit. 1849.

Lithophila vermiculata Uline, Field Mus. Bot. 2: 39. 1900.

Fleshy, the stems prostrate, branched, 1-8 dm. long, the branches prostrate or ascending, sometimes 1.5 dm. high. Leaves thick, or subtérète, linear, linear-oblong, oblong or clavate, 1-5 cm. long, acutish or blunt at the apex, narrowed to the sessile base; heads subglobose to cylindrical, densely many-flowered, bright white, 1-2.5 cm. long, 6-10 mm. thick; sepals about 3 mm. long, obtuse, a little longer than the bracts.

Saline soil along the coasts, Porto Rico; Muertos; Vieques; St. Croix; St. Thomas; Tortola; Virgin Gorda; Anegada.—Florida; West Indies; continental tropical America; west coast of tropical Africa. Races differ in size, shape and thickness of leaves. SALT-WEED. Recorded by Urban as called LIRIO in Porto Rico, which seems unlikely, as that name belongs to *Hymenocallis*.

Family 3. **NYCTAGINACEAE** Lindl.

FOUR-O'CLOCK FAMILY.

Herbs, shrubs or trees, with simple leaves, and regular flowers in clusters, in many of the genera subtended by involucre. Petals none. Calyx inferior, usually corolla-like, its limb 4-5-lobed or 4-5-toothed. Stamens hypogynous; filaments filiform; anthers 2-celled, dehiscent by lateral slits. Ovary enclosed by the tube of the perianth, 1-celled, 1-ovuled; ovule campylotropous; stigma capitate. Fruit a ribbed, grooved or winged anthocarp. About 25 genera and 350 species, of wide geographic distribution, most abundant in America.

Herbs; flowers perfect.

Perianth large; involucre large, gamophyllous.

Perianth small; involucre of minute bracts.

Fruit 5-angled or 5-ribbed.

Fruit 10-ribbed.

Trees, shrubs or woody vines; flowers dioecious.

Stamens exserted.

Fruit drupe-like, fleshy.

Fruit dry, with 5 rows of glands.

Stamens included.

1. *Mirabilis*.

2. *Boerhaavia*.

3. *Commnicarpus*.

4. *Torrubia*.

5. *Pisonia*.

6. *Neea*.

1. **MIRABILIS** L. Sp. Pl. 177. 1753.

Perennial herbs, with large tuberous roots and forking stems. Leaves opposite, somewhat fleshy, petioled, or the upper sessile. Flowers in cymes. Involucre calyx-like, 5-lobed. Calyx colored, its tube elongated, somewhat constricted above the ovary, its limb expanded. Stamens 5 or 6, unequal; filaments filiform, slender, incurved, united into a fleshy cup at the base. Style filiform. Fruit ribbed. Seed filling the pericarp, to which the testa adheres; endosperm mealy. [Latin, beautiful.] Twenty or more American species, the following typical.

1. *Mirabilis Jalapa* L. Sp. Pl. 177. 1753.

Mirabilis odorata L. Cent. Pl. 1: 7. 1755.

Mirabilis dichotoma L. Sp. Pl. ed. 2, 252. 1762.

Mirabilis Jalapa odorata L.; Heimerl, Bot. Jahrb. 21: 616. 1896.

Foliage deep green, glabrous or slightly pubescent. Stem erect, 3–7 dm. tall, much branched; leaves ovate, acuminate, sometimes sparingly ciliate, entire, truncate or cordate at the base, the petioles about one half as long as the blades; involucre campanulate, 7–8 mm. high, pubescent, 1-flowered, their lobes ovate-lanceolate, twice as long as the tube, acute; calyx trumpet-shaped, 3–5 cm. long, deep red to purple or white, often more or less blotched, the edge notched; stamens exserted; fruit ovoid, black, 8–10 mm. long, wrinkled-tuberculate, 5-ribbed.

Waste grounds spontaneous after cultivation, Porto Rico; Vieques; St. Croix; St. Thomas; Tortola;—Florida; Bermuda; West Indies; Texas to Central and South America. Commonly planted in flower gardens. FOUR-O'CLOCK. SICILIANA.

2. *BOERHAAVEA* L. Sp. Pl. 3. 1753.

Slender, erect or diffuse, annual or perennial herbs, with forking stems and branches, sometimes woody at the base. Leaves opposite, the blades more or less unequal, entire or sinuate. Flowers perfect, small, umbellate, cymose, capitate or racemose, subtended by minute bracts. Calyx campanulate or funnel-shaped, deciduous, the tube short or elongate, the limb spreading, 5-lobed. Stamens 1–5, exserted or included; filaments slender, connate at the base. Ovary stipitate; style filiform; stigma peltate. Anthocarp obovoid or clavate, 3–5-angled, rarely 3–5-winged. Seed adhering to the pericarp; embryo uncinate. [In honor of Hermann Boerhaave, 1668–1738, a celebrated Dutch scientist.] About 40 species, natives of warm and tropical regions, known as HOG-WEED. Type species: *Boerhaavea diffusa* L.

Fruit glandular-puberulent; perennial.
Fruit glabrous; annual.

1. *B. coccinea*.
2. *B. erecta*.

1. *Boerhaavea coccinea* Mill. Gard. Dict. ed. 8, no. 4. 1768.

Boerhaavea hirsuta Jacq. Hort. Vind. 1: 3. 1770.

Boerhaavea caribaea Jacq. Obs. 4: 5. 1771.

Boerhaavea diffusa Sw. Obs. 10. 1791. Not L. 1753.

Boerhaavea paniculata Rich. Act. Soc. Hist. Nat. Par. 1: 105. 1792.

Boerhaavea viscosa Lag. & Rodr. Anal. Ci. Nat. 4: 256. 1801.

Boerhaavea decumbens Vahl, Enum. Pl. 1: 284. 1804.

Boerhaavea diffusa paniculata Kuntze, Rev. Gen. Pl. 533. 1891.

Perennial, procumbent or ascending, branched, 3–12 dm. high, often pubescent, at least below, the branches glabrous or puberulent. Leaves rhombic-ovate to oblong or nearly orbicular, 2–6 cm. long, 0.8–5 cm. broad, rounded, obtuse or occasionally acute at the apex, truncate, rounded, or subcordate at the base, slender-petioled, entire or undulate; panicle slender, often 3 dm. long, its branches nearly filiform, glabrous or puberulent; flowers reddish, 2 mm. broad; fruit obovoid, 2.5–4 mm. long, 5-grooved, glandular.

Waste places, fields and river banks, Porto Rico at lower elevations; Mona; Icaos; Desecheo; Muertos; Vieques; St. Thomas; St. Croix; St. Jan; Tortola; Virgin Gorda;—Florida; West Indies; Mexico through Central America to northern South America; tropical Africa. Races differ in pubescence and in size of the fruit. [*B. repens* of Mills-paugh.] TOSTON.

2. **Boerhaavea erecta** L. Sp. Pl. 3. 1753.

Annual, erect or ascending, branched, 2–10 dm. high. Leaves ovate to deltoid-ovate, sometimes inequilateral, 2–7 cm. long, 1–4.5 cm. broad, apiculate, repand or undulate, acute to cordate at the base, minutely brown-dotted on the lower whitish surface, the petioles usually about one half as long as the blades or longer; peduncles filiform; flowers 2–6 in a cluster; calyx white to purple, its tube glabrous, the limb campanulate, 1–1.5 mm. long, sparingly pubescent; stamens exserted; fruit obpyramidal, 3–3.5 mm. long, 1–1.5 mm. broad at the truncate apex, 5-angled, glabrous.

Fields, banks and cultivated grounds at lower elevations, Porto Rico; St. Croix St. Thomas; Tortola:—southern United States; Bermuda; West Indies; Mexico to Central and South America.

3. **COMMICARPUS** Standley, Contr. Nat. Herb. 12: 373. 1909.

Perennial herbs, with long forking stems, opposite entire petioled leaves and small perfect umbellate flowers. Calyx short-funneliform, the limb rather widely expanded. Stamens 2–5, exserted, the filaments slender. Ovary oblique; style slender. Fruit clavate, 10-ribbed, mucilaginous-glandular, the glands rather large. Seed adherent to the pericarp; embryo uncinately. [Greek, viscid fruit.] About 5 species, natives of tropical and subtropical America, the following typical.

1. **Commicarpus scandens** (L.) Standley, Contr. Nat. Herb. 12: 373. 1909.

Boerhaavea scandens L. Sp. Pl. 3. 1753.

Glabrous, stems slender, pale, elongated and often vine-like, much branched, sometimes 3 m. long. Leaves ovate, rather thin, somewhat fleshy, 1.5–6 cm. long, 1–4.5 cm. wide, acute, acuminate or obtuse at the apex, cordate or truncate at the base, the petioles 2.5 cm. long or less; peduncles slender, mostly longer than the leaves; umbels several-flowered; pedicels filiform, 5–10 mm. long; calyx greenish, 3–4 mm. broad; fruit narrowly clavate, 7–10 mm. long, glandular toward the blunt apex, its ribs low and obscure.

Thickets and hillsides at lower elevations, Porto Rico, mostly in dry districts; St. Thomas; Tortola; Virgin Gorda:—Jamaica; Bahamas; Cuba; Hispaniola; St. Martin; St. Barts:—Texas to Guatemala and Peru. PEGA-POLLO.

4. **TORRUBIA** Vell. Fl. Flum. 139. 1825.

Unarmed shrubs or trees, with opposite, often somewhat fleshy leaves, and small greenish dioecious paniced flowers. Perianth-limb 5-toothed. Stamens about 10, exserted, the filaments filiform. Ovary sessile; style slender or short. Anthocarp fleshy, drupe-like, obovoid to ellipsoid or subglobose, without glands in rows, enclosing the utricle. [Commemorates José Torrubia, a Spanish naturalist.] Fifteen species or more, of tropical and subtropical America. Type species: *Torrubia opposita* Vell.

Leaves rounded at the apex.

Leaves usually abruptly acute or short-acuminate at the apex.

1. *T. discolor*.

2. *T. fragrans*.

1. **Torrubia discolor** (Spreng.) Britton, Bull. Torr. Club 31: 613. 1904.

Pisonia discolor Spreng. Syst. 2: 168. 1825.

A shrub or small tree. Leaves oblong, elliptic, obovate or oblanceolate, 2–6.5 cm. long, 1–4 cm. broad, obtuse or rounded at the apex, cuneate or sometimes rounded at the base, thin, glabrous, the slender petiole 2 cm. long or less;

peduncles slender, axillary and terminal, 1–2.5 cm. long, glabrous or nearly so, the inflorescence often few-flowered, 1–4 cm. broad; flowers sessile or subsessile; fruit oblong or ellipsoid, 5–8 mm. long, 3.5–4 mm. broad, scarlet, the utricle 10-striate.

Rocky hillsides and thickets, Punta Montalva, Porto Rico; Desecheo.—Cuba; Jamaica; Hispaniola. Recorded by Krebs from St. Thomas, probably in error.

2. **Torrubia fragrans** (Dum.-Cours.) Standley, Contr. U. S. Nat. Herb. **18**: 100. 1916.

Pisonia obtusata Sw. Fl. Ind. Occ. 1960. 1806. Not Jacq. 1798.

Pisonia fragrans Dum.-Cours. Bot. Cult. ed. 2, **7**: 114. 1814.

Pisonia inermis Griseb. Fl. Br. W. Ind. **71**, in part. 1859. Not Jacq. 1763.

A tree up to 20 m. high, with a trunk 6–9 dm. in diameter with grayish or grayish brown branches, the bark smooth. Leaves, rhombic-oval, rhombic-ovate, obovate or oblanceolate, usually broadest above the middle, 3.5–13 cm. long, 2–7.5 cm. broad, abruptly acute to acuminate at the apex, acute or rarely obtuse at the base, glabrous, lustrous above, dull beneath; peduncles mostly terminal, 2–9 cm. long, puberulent or glabrous, the inflorescence many-flowered, cymose, 2–7 cm. broad; flowers sessile or short-pedicelled; fruit ellipsoid, 7–11 mm. long, 3–4 mm. in diameter. [*P. coccinea* of West; *P. nigricans* of Krebs.]

Forests, thickets and hills at lower and middle elevations in moist and dry districts, Porto Rico, ascending to 900 m.; Icaos; Culebra; St. Croix; St. Thomas; Tortola; Virgin Gorda.—West Indies (except Bahamas); Central and South America. BLACK MAMPOO. CORCHO. MAJAGUA QUE MONA.

5. **PISONIA** L. Sp. Pl. 1026. 1753.

Woody vines, shrubs or trees, some species armed with prickles. Leaves mostly opposite, entire. Flowers dioecious, in sessile or pedunculate cymes, bracteolate. Staminate perianth obconic-campanulate, the limb 5-toothed; stamens 6–10; filaments filiform, connate below into a tube or ring; anthers exerted. Pistillate perianth tubular, the limb 5-toothed; ovary sessile; style slender; stigma capitellate. Anthocarp coriaceous, oblong or clavate, terete and costate or 5-angled, bearing viscid stalked glands in rows; utricle elongate. [Commemorates William Piso, a physician of Leyden, who travelled in Brazil, died in 1648.] Twenty species or more of tropical and subtropical distribution. Type species: *Pisonia aculeata* L.

Straggling shrubs or large woody vines armed with stout recurved prickles.

Mature fruit 3–4 mm. in diameter, the glands along the angles uniseriate or nearly so.

Mature fruit 5–6.5 mm. in diameter, the glands along the angles in 2 rows or more.

Unarmed trees.

Leaf-blades often subcordate at the base, glabrous or nearly so; fruit 10-costate.

Leaf-blades obtuse, rounded or somewhat acutish at the base, cinereous-tomentulose beneath; fruit 5-angled.

1. *P. aculeata*.

2. *P. Helleri*.

3. *P. subcordata*.

4. *P. albida*.

1. **Pisonia aculeata** L. Sp. Pl. 1026. 1753.

A straggling shrub, or a woody vine sometimes 10 m. long, usually armed with numerous stout recurved prickles, sometimes unarmed. Leaves elliptic, oval, ovate-oblong, or suborbicular, 2.5–14 cm. long, 2–6 cm. broad, acute, short-acuminate or obtuse at the apex, cuneate or sometimes rounded at the base, leathery, glabrous or occasionally pubescent on both sides, or glabrous above and tomentulose beneath, the petioles 1–4 cm. long; cymes many-flowered, puberulent; staminate perianth 3–4 mm. long, puberulent, yellowish-green, the

lobes broad, acutish; stamens usually 6; pistillate perianth 2–2.8 mm. long, puberulent; fruit clavate, 9–14 mm. long, 3–4 mm. in diameter, rounded at the apex, 5-angled, the glands along the angles uniseriate or nearly so, the pedicels 1.6 cm. long or less.

Thickets, hillsides and woodlands, Porto Rico, at low elevations in moist or dry districts; Vieques; St. Thomas; St. Croix:—West Indies; Florida; continental tropical America and Old World tropics. PRICKLY MAMPOO. ESCAMBRON

2. **Pisonia Helleri** Standley, N. A. Flora **21**: 187. 1918.

Similar to the preceding. Fruit clavate or clavate-oblong, 10–14 mm. long, 5–6.5 mm. in diameter, rounded or slightly depressed at the apex. 5-angled, the glands along the angles in 2 or more rows, the pedicels 1–3 cm. long.

Limestone hills and thickets at lower elevations in wet or moist districts, Porto Rico:—Isle of Pines; Jamaica; Hispaniola; Martinique; Guadeloupe; Antigua. [*Pisonia aculeata pedicellaris* of Urban.]

3. **Pisonia subcordata** Sw. Prodr. 60. 1788.

Pisonia nigricans West, Bidr. St. Croix 312. 1793. Not Sw. 1800.

Pisonia subovata Poir. in Lam. Encyc. **5**: 347. 1804.

Pisonia subcordata typica Swartziana Heimerl, Bot. Jahrb. **21**: 630. 1896.

Pisonia subcordata typica gigantophylla Heimerl, Bot. Jahrb. **21**: 630. 1896.

An unarmed tree, 7–25 m. high, with a trunk up to 1 m. in diameter, the gray bark smooth, the twigs and foliage ferruginous-puberulent when young, glabrous or nearly so in age. Leaves oval or suborbicular, 5.5–27 cm. long, 4.5–20 cm. broad, rounded and occasionally shallowly emarginate at the apex, rounded and often subcordate at the base, finely reticulate-veined and glabrous or nearly so beneath; peduncles 1–3 cm. long; staminate inflorescence 2–3.5 cm. broad, the flowers greenish-yellow, subsessile or with short stout pedicels, the campanulate perianth 3–4 mm. long, the stamens often nearly twice as long; pistillate inflorescence loosely corymbose, the flowers on pedicels 2–5 mm. long, the perianth about 3 mm. long or shorter; fruit clavate or cylindric, 10–13 mm. long, 1.5–1.7 mm. in diameter, 10-striate, bearing 5 rows of glands near the apex.

Thickets, hillsides and forests, Porto Rico, ascending to the higher elevations; Icaicos; Culebrita; Vieques; St. Thomas; St. Croix; Tortola; Aneгада:—St. Martin to Martinique. The race with very large, thin leaves inhabits hills of the Arcibo Limestone in northern Porto Rico. WATER MAMPOO. PALO BOBO. LOBLOLY.

4. **Pisonia albida** (Heimerl) Britton; Standley, N. A. Flora **21**: 190. 1890.

Pisonia subcordata typica albida Heimerl, Bot. Jahrb. **21**: 630. 1896.

Pisonia subcordata albida Heimerl in Urban, Symb. Ant. **4**: 226. 1905.

A tree, 6–12 m. high or higher, with puberulent twigs and petioles, the bark smooth, light gray. Leaves oblong to elliptic or oval, or occasionally somewhat ovate, 4.5–12 cm. long, 2.5–7.5 cm. broad, often much larger on the young shoots, obtuse, rounded or occasionally acutish at the apex, rounded or acute at the base, grayish green and glabrous above, paler and cinereous-tomentulose beneath, the petioles 1–2.5 cm. long or longer; peduncles 1–3 cm. long, tomentulose; staminate inflorescence 2–3.5 cm. broad, the flowers short-pedicillate, the calyx 3 mm. long, puberulent, the stamens usually 8, much longer than the perianth; pistillate inflorescence divaricate-branched, the pedicels 2–14 mm. long, the clavate fruit 6–7 mm. long, 5-angled, the angles each bearing a row of uniseriate glands above the middle.

Limestone hills and coastal thickets at lower elevations in dry districts, Porto Rico; Mona; Muertos. Endemic.

6. **NEEA** R. & P. Fl. Per. Prodr. 52. 1794.[*EGGERSIA* Hook. f. in Hook. Ic. 15: 1. 1883.]

Shrubs or trees. Leaves opposite, verticillate or rarely alternate. Flowers usually dioecious. Staminate perianth urceolate, subglobose, or elongate, 4-5-toothed; stamens 8 or 10, included, inserted at the base of the perianth; filaments unequal; anthers oblong. Pistillate perianth tubular-urceolate, 4-5-toothed; stamens with sterile anthers inserted at the base of the ovary; style included; stigma penicillate. Anthocarp somewhat fleshy on the outside, usually crowned by the persistent perianth. Seed with a hyaline testa. Embryo straight; endosperm scant, fleshy; radicle short. [Dedicated to Dr. Luis Neë.] About 40 species, natives of tropical America. Type species: *Neea verticillata* R. & P.

1. **Neea buxifolia** (Hook. f.) Heimerl, Bot. Jahrb. 21: 633. 1896.*Eggersia buxifolia* Hook. f. in Hook. Ic. 15: 1. 1883.

A shrub, 2-8 m. high, with slender grayish branches. Leaves oblong to oblong-ovate or oblanceolate, 9-24 mm. long, 3-9 mm. wide, obtuse or rounded at the apex, narrowed at the base into a short petiole or subsessile, glabrous, coriaceous, the margin more or less revolute; peduncles slender, 3.8-5 mm. long, pubescent; staminate perianth 3.5 mm. long, pubescent or glabrate, 5-toothed; stamens 5-8; pistillate perianth 3 mm. long, slightly contracted in the throat, 5-dentate; fruit unknown.

Coastal thickets and wooded hillsides, Porto Rico, in eastern and northern districts at low elevations; Culebra; St. Thomas; St. Jan. Endemic.

Bougainvillea spectabilis Willd., Brazilian, commonly planted for ornament in Porto Rico and the Virgin Islands, is one of the most elegant vines of tropical regions, climbing high on porches, arbors and fences, covered when in bloom with masses of rose or rose-purple inflorescence. It has alternate ovate entire acuminate petioled leaves 4-8 cm. long, and slender prickly branches; the small flowers are subtended by thin ovate-elliptic bracts 3-4 cm. long, which form the conspicuous part of the inflorescence. TRINITARIA.

Bougainvillea glabra Choisy, also Brazilian, is a similar vine, usually smaller than *B. spectabilis*, occasionally grown in Porto Rico and the Virgin Islands, differing in having bright red bracts.

Family 4. **BATIDACEAE** Dammer.

SALTWORT FAMILY.

Low fleshy much-branched shrubs, with opposite semiterete, linear or club-shaped, entire sessile estipulate leaves, and small dioecious greenish flowers in axillary spikes. Staminate spikes with many persistent imbricated scales, each subtending a flower; calyx 2-lobed; stamens 4 or 5, with stout filaments alternating with staminodia; anthers introrse. Pistillate spikes 4-12-flowered, the scales deciduous; calyx and corolla wanting; ovary sessile, 4-celled; ovule 1 in each cavity, erect, anatropous; stigma sessile, somewhat 2-lobed; fruit aggregate, about 4-seeded. Seeds club-shaped, the testa membranous; endosperm none; cotyledons large. Only the following genus.

1. **BATIS** L. Syst. ed. 10, 1289. 1759.

Characters of the family. [Greek, from the fancied resemblance of the fruit to a blackberry.] A monotypic genus.

1. **Batis maritima** L. Syst. ed. 10, 1289. 1759.

A glabrous shrub 1 m. high or less, the rather stout stems spreading, prostrate or ascending, the branches nearly erect, angular. Leaves acutish, 1–2.5 cm. long; spikes ovoid or oblong, 5–10 mm. long, the staminate sessile, the pistillate short-peduncled; scales nearly orbicular or reniform, longer than the calyx; stamens exserted, longer than the triangular staminodia; fruit 1–2 cm. long, drooping.

Saline soil along the coasts, Porto Rico; Icaicos; Vieques; Culebra; St. Croix; St. Thomas; Tortola; Anegada:—southeastern United States; California; West Indies; continental tropical America Galapagos; Sandwich Islands. [*Dondia linearis* of Mills-paugh.] SALTWORT. BARRILLA.

Family 5. **PHYTOLACCACEAE** Lindl.

POKEWEED FAMILY.

Herbs, some tropical species shrubs, vines or trees, with alternate entire, mostly estipulate leaves, and perfect regular, polygamous or monoecious flowers. Calyx 4–5-parted or of 4 or 5 sepals, its segments or sepals imbricated in the bud. Petals usually wanting. Stamens as many as the calyx-segments or sepals and alternate with them, or more numerous, hypogynous; filaments distinct, or united at the base; anthers 2-celled, the sacs longitudinally dehiscent, often nearly separated. Ovary superior, several-celled in most of the genera; ovules solitary in the cavities, amphitropous. Styles as many as the carpels, short, or none; stigmas linear or filiform. Fruit a berry or an achene. Endosperm of the seed mealy or fleshy. About 22 genera and 110 species, mostly in the tropics.

Perianth-segments 4.

Fruit a globose berry.

Stamens 4; style elongated.

Stamens 8–16; style none.

Fruit dry, achene-like, with deflexed bristles at the apex.

Perianth-segments 5.

Ovary one-celled, with 2 stigmas.

Ovary several-celled, with as many stigmas as cells.

1. *Rivina*.

2. *Trichostigma*.

3. *Petiveria*.

4. *Microtea*.

5. *Phytolacca*.

1. **RIVINA** L. Sp. Pl. 121. 1753.

Herbs, sometimes woody below, the stems branched, erect, the leaves thin in texture, the small perfect flowers in axillary or terminal, slender racemes. Sepals 4, not enlarging in fruit. Stamens 4, the filaments filiform, the anthers erect. Ovary 1-celled, subglobose; style curved; stigma capitate. Fruit a small subglobose berry. Seed erect, lenticular, its testa crustaceous, the embryo curved, the endosperm mealy. [Commemorates August Rivinus, 1652–1725, professor in Leipzig.] About 3 species of tropical and subtropical America, the following typical.

1. **Rivina humilis** L. Sp. Pl. 121. 1753.

Rivina humilis glabra L. Sp. Pl. 122. 1753.

Rivina humilis canescens L. loc. cit. 122. 1753.

Rivina laevis L. Mant. 1: 41. 1767.

Rivina purpurascens Schrad. Gen. Ill. 17. 1809.

Rivina laevis pubescens Griseb. Fl. Br. W. I. 59. 1859.

Rivina viridiflora Bello, Anal. Soc. Esp. Hist. Nat. 12: 105. 1883.

Glabrous or finely pubescent, branched, 3–8 dm. high. Leaves ovate to oblong or lanceolate, 3–12 cm. long, membranous, flaccid, undulate or entire,

acute or acuminate at the apex, narrowed or subtruncate at the base, the slender petioles 1–5 cm. long; racemes 10 cm. long or less, loosely several-many-flowered; pedicels 4–6 mm. long; bracts deciduous; calyx about 6 mm. wide, the sepals oblong-cuneate, obtuse, pink or nearly white; stamens somewhat shorter than the sepals; berries subglobose, red, about 3 mm. in diameter.

Fields, thickets, banks, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; Texas; West Indies; continental tropical America. CARMIN. CAT'S-BLOOD.

2. **TRICHOSTIGMA** A. Rich. in Sagra, Hist. Cuba 10: 306. 1845.

Woody vines, or shrubs, with alternate petioled broad leaves, the small perfect flowers in slender bracted racemes. Sepals 4, concave, spreading or reflexed. Stamens 8–16; filaments filiform; anthers linear, versatile, 2-cleft. Ovary subglobose, 1-celled; stigma sessile, penicillate. Fruit coriaceous, baccate, subglobose, the pericarp adherent to the erect seed. [Greek, referring to the penicillate stigma.] About 3 species, of tropical America, the following typical.

1. **Trichostigma octandrum** (L.) H. Walter, Pflanzenr. 39: 109. 1909.

Rivina humilis scandens L. Sp. Pl. 122. 1753.

Rivina octandra L. Cent. Pl. 2: 9. 1756.

Rivina scandens Mill. Gard. Dict. ed. 8, 1768.

Trichostigma rivinoides A. Rich. in Sagra, Hist. Cuba 10: 306. 1845.

Villamilla octandra Hook. f. in Benth. & Hook. Gen. Pl. 3: 81. 1880.

A woody vine, often 10 m. long or longer, usually climbing on trees, the stem up to 1.5 dm. in diameter at the base, the branches long and slender, glabrous. Leaves elliptic, oblong, or elliptic-lanceolate, membranous, 5–15 cm. long, 1.8–5.9 cm. broad, acuminate or acute at the apex, narrowed or occasionally rounded at the base, glabrous, entire, the slender petioles 1–5 cm. long; racemes usually numerous, loosely many-flowered, as long as the leaves or longer; pedicels 2–10 mm. long; flowers white, about 8 mm. broad, the ovate obtuse sepals at length reflexed; berry black, about 6 mm. in diameter.

Woods and thickets at lower elevations in moist districts, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Florida; West Indies; continental tropical America. HOOP-VINE. BASKET WISS. BEJUCO DE PALOMA.

3. **PETIVERIA** L. Sp. Pl. 342. 1753.

An erect slender perennial herb with the odor of garlic, the leaves broad, membranous, alternate, entire, the small perfect flowers in slender bracted spikes. Calyx 4-parted, conic at the base, the segments lanceolate, spreading in flower, erect in fruit. Stamens 4–8; filaments subulate; anthers linear, 2-cleft at apex and base; ovary oblong, flattened, truncate, tomentose, 1-celled, with 1–6 deflexed bristles near the apex; style very short or none; stigma penicillate. Fruit elongated, cuneate, flattened, striate, keeled on both sides, 2-lobed at the top and bearing 1–6 hooked bristles. Seed linear. [In honor of Jacob Petiver, English naturalist and apothecary, who died in 1718.] A monotypic genus.

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

Stem puberulent above, or glabrate, erect, branched, 3–10 dm. high, the branches slender, long, nearly erect or ascending. Leaves elliptic, oblong or obovate, sparingly pubescent or glabrous, 3–12 cm. long, 2.5–5 cm. broad, acute or acuminate at the apex, narrowed at the base, short-petioled; spikes very

slender, 1-4 dm. long; puberulent; flowers greenish, short-pedicelled; sepals, narrowly linear, about 4 mm. long; achene linear-cuneate, about 6 mm. long appressed to the axis of the spike, the terminal, reflexed bristles about 2 mm. long.

Thickets, waste and cultivated grounds at lower elevations, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola.—Florida; West Indies; continental tropical America, north to Mexico. GARLIC-WEED. ANAMU. GULLY-ROOT. GUINEA-HEN WEED. CONGA-ROOT.

4. **MICROTEA** Sw. Prodr. 53. 1788.

Erect or prostrate herbs, with alternate, petioled or sessile leaves. Flowers perfect, minute. Sepals 5. Stamens 5-8; filaments subulate or linear. Ovary 1-celled, of two carpels. Stigmas 2; ovule solitary. Fruit subglobose, tuberculate echinate or smooth. Embryo semi-annular. Cotyledons concave, one twice as large as the other; radicle thick, short. [Greek, alluding to the small flowers.] About 9 species, of tropical America. Type species: *Microtea debilis* Sw.

Fruit covered with a honeycomb-like network uniting the spine-like tubercles.

Fruit reticulate-veined, without spine-like tubercles.

1. *M. debilis*.

2. *M. portoricensis*.

1. **Microtea debilis** Sw. Prodr. 53. 1753.

A prostrate or ascending annual herb with slender branches. Leaves thin, elliptic, ovate, obovate, oblanceolate or somewhat spatulate, 3-7 cm. long, 1-3.2 cm. broad, acute or obtuse at the apex, acute or cuneate at the base; glabrous; perianth-segments elliptic or ovate, 0.6-0.7 mm. long, 0.3-0.4 mm. broad; fruit subglobose or globose-obovoid, 1.2-1.5 mm. long, 1-1.2 mm. broad, covered with a honeycomb-like network uniting the spine-like tubercles.

Waste grounds, Dorado, Porto Rico; Vieques; St. Croix; St. Thomas.—West Indies (except Bahamas); Central and South America.

2. **Microtea portoricensis** Urban, Ber. Deutsch. Bot. Gesell. 3: 324. 1885.

A prostrate annual herb closely resembling the preceding. Perianth-segments oblong-elliptic 0.7 mm. long, 0.4 mm. broad; fruit subglobose, 0.9-1 mm. broad, reticulate-veined, without spine-like tubercles.

Fields and hillsides near Trujillo-bajo and Cabo Rojo, Porto Rico.—Cuba.

5. **PHYTOLACCA** L. Sp. Pl. 441. 1753.

Tall perennial herbs, with petioled estipulate leaves, and small flowers in terminal racemes, which by the further growth of the stem become opposite the leaves. Pedicels bracted at the base and often 1-3-bracted above. Calyx of 5 persistent rounded sepals. Stamens 5-20, inserted at the base of the calyx. Ovary composed of 5-20 distinct or somewhat united carpels. Fruit a depressed-globose 5-15-celled fleshy berry. Seeds 1 in each cavity, erect, compressed; embryo annular in the mealy endosperm. [Name Greek and French, referring to the crimson juice of the berries.] About 24 species, mostly tropical. Type species: *Phytolacca americana* L.

Pedicels as long as the flowers, in fruit 2-4 mm. long.

Pedicels longer than the flowers, in fruit 6-10 mm. long.

1. *P. icosandra*.

2. *P. rivinoides*.

1. *Phytolacca icosandra* L. Syst. ed. 10, 1040. 1759.*Phytolacca octandra* L. Sp. Pl. ed. 2, 631. 1762.

Erect, glabrous, or puberulent above, branched, somewhat succulent, 1-3 m. high. Leaves elliptic to ovate-lanceolate, membranous, 8-20 cm. long, acute or acuminate at the apex, narrowed at the base, the rather stout petioles 1-5 cm. long; racemes erect, densely many-flowered, 1-3 dm. long; pedicels 2-4 mm. long; flowers greenish white or yellowish; sepals rounded; stamens 8-20; carpels 8-20; berry black, depressed-globose, about 8 mm. in diameter.

Porto Rico, collected by Pleé (according to Moquin):—Jamaica; Bahamas; Cuba; Hispaniola; Trinidad; continental tropical America. Also recorded from the Old World. SOUTHERN POKE-WEED.

2. *Phytolacca rivinoides* Kunth & Bouché, Ind. Sem. Hort. Berol. 1848: 15. 1848.

Stem weak, vine-like, glabrous, occasionally 4 or 5 m. long. Leaves elliptic, ovate or ovate-lanceolate, 8-18 cm. long, 3-8 cm. broad, acuminate at the apex, acute or cuneate at the base; petioles 2-5.8 long; racemes loosely flowered, 2-5 dm. long; fruiting pedicels 6-10 mm. long; flowers white or pinkish; sepals rounded; stamens 10-20; carpels 10-16; berry black, 5-7 mm. in diameter.

Woodlands, thickets and river-banks in moist districts, ascending to higher elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America. (*P. icosandra* of Urban, not of Linnaeus.) JUAN DE VARGAS.

Agdestis elematoidea Moç. & Sessé, Mexican, occasionally planted for ornament in Porto Rico, is a long woody vine, with a very large tuber, the reddish stems sometimes 15 m. long, the alternate petioled leaves cordate, the small white flowers in large panicles, the sepals 4.

Family 6. **AIZOACEAE** A. Br.

CARPET-WEED FAMILY.

Annual or perennial herbs, often prostrate and branching, with mostly opposite, more or less fleshy leaves, and perfect small regular flowers. Stipules none or scarious, or the petiole-bases dilated. Calyx 4- or 5-cleft or 4-parted. Petals small, or none in most species. Stamens hypogynous or perigynous. Ovary usually free from the calyx, 3-many-celled; ovules few or numerous in each cell. Fruit a capsule with loculicidal or circumscissile dehiscence. Seeds amphitropous; endosperm scanty or copious; embryo slender, curved. About 22 genera and 500 species mostly of warm regions, a few in the temperate zones.

Capsule loculicidally dehiscent.

Capsule circumscissile.

Capsule 3-5-celled.

Capsule 1- or 2-celled.

Stamens 5-10 or more.

Stamens 2 or 3.

1. *Mollugo*.2. *Sesurium*.3. *Trianthema*.4. *Cypselea*.1. **MOLLUGO** L. Sp. Pl. 89. 1753.

Erect or prostrate, mostly annual herbs, with verticillate, or in some species basal or alternate leaves, and small cymose or axillary flowers. Stipules scarious, deciduous. Calyx 5-parted, persistent. Petals none. Stamens 3-5. Ovary 3-5-celled, superior; styles 3-5; ovules numerous. Capsule subglobose or ellipsoid, loculicidally 3-5-valved. Seeds few or numerous, small, the testa smooth, granular or sculptured. [An old Latin name for some soft plant applied to this

genus because of the resemblance in the arrangement of its leaves to those of *Galium Mollugo*.] About 14 species, natives of the tropics of the Old World; a few also in north temperate and tropical America. Type species: *Mollugo verticillata* L.

Cauline leaves in whorls; flowers axillary.
Leaves all basal; flowers in long-peduncled cymes.

1. *M. verticillata*.
2. *M. nudicaulis*.

1. **Mollugo verticillata** L. Sp. Pl. 89. 1753.

Mollugo Berteriana Ser. in DC. Prodr. 1: 391. 1824.

Pharnaceum Berterianum Spreng. Syst. 1: 949. Excl. syn. 1825.

Pharnaceum lineare Bert.; Ser. in DC. Prodr. 1: 391, a synonym. 1824.
Not L. 1781.

Mollugo verticillata scrobiculata juncea Rohrb. Mart. Fl. Bras. 14²: 242. 1872.

A glabrous prostrate herb, sometimes forming patches 1 m. or more in diameter, the branches sometimes ascending. Leaves verticillate, often in 5's or 6's, spatulate, obovate or linear, 0.7–3 cm. long, 1–11 mm. broad, obtuse or rounded at the apex, tapering at the base into the petiole; flowers axillary, the pedicels filiform; sepals oblong or elliptic, 2–2.5 mm. long, 0.6–1.2 mm. broad; capsule ellipsoid, 2.5–3 mm. long, 1.5–2 mm. in diameter; seeds reniform, 0.6 mm. long, brown, smooth and shining, ridged along the back.

Sandy plains, waste and cultivated grounds at lower elevations, Porto Rico; Vieques; Buck Island, St. Thomas; Tortola; Virgin Gorda;—Cuba; Jamaica; Hispaniola; St. Barts; St. Eustatius; St. Vincent; Margarita; Bonaire; Curaçao; continental America. On the white sands of the northern coastal plain of Porto Rico, a race with very narrow leaves occurs, deep-rooted and apparently perennial. CARPET-WEED.

2. **Mollugo nudicaulis** Lam. Encycl. 4: 234. 1797.

Mollugo bellidifolia Ser. in DC. Prodr. 1: 391. 1824.

A glabrous herb, 7–30 cm. high. Leaves all basal, in an erect-spreading tuft, spatulate or obovate, 1.5–5 cm. long, 6–16 mm. broad, rounded at the apex, tapering at the base into the petiole; cymes long-peduncled, the peduncles slender, somewhat angled and grooved; flowers slender-pedicelled; calyx-lobes elliptic, about 2 mm. long, 0.8–1 mm. broad; capsule ellipsoid, 2–2.5 mm. long; seeds reniform, 0.5–0.6 mm. long, black, granulate.

Sandy and rocky soil at lower elevations northern and western districts of Porto Rico; St. Thomas; St. Croix; Virgin Gorda;—Jamaica; Cuba; Hispaniola; St. Lucia; Guiana; Old World tropics.

2. **SESUVIUM** L. Syst. ed. 10, 1058. 1759.

Fleshy decumbent or prostrate herbs, with opposite leaves and axillary pink or purplish flowers. Stipules none, but the petioles often dilated and connate at the base. Calyx-tube top-shaped, 5-lobed, the lobes oblong, obtuse. Petals none. Stamens 5–60, inserted on the calyx-tube. Filaments filiform, sometimes united at the base. Ovary 3–5-celled. Ovules numerous. Styles 3–5, papillose along the inner side. Capsule membranous, oblong, 3–5-celled, circumscissile. Seeds round-reniform, smooth; embryo annular. [An unexplained name.] About 6 species, natives of seacoasts and other saline regions. Type species: *Sesuvium Portulacastrum* L.

Stamens 5; flowers usually sessile.
Stamens numerous; flowers often long-pedicelled.

1. *S. maritimum*.
2. *S. Portulacastrum*.

1. **Sesuvium maritimum** (Walt.) B. S. P. Prem. Cat. N. Y. 20. 1888.

Pharnaceum maritimum Walt. Fl. Car. 117. 1788.

Sesuvium pentandrum Ell. Bot. S. C. & Ga. 1: 556. 1821.

Annual, glabrous; branches 0.5–3 dm. long. Leaves obovate or spatulate, entire, rounded or slightly emarginate at the apex, narrowed into a petiole or the

upper sessile, 8–25 mm. long; flowers sessile or nearly so, about 2 mm. broad, mostly solitary; stamens 5, alternate with the calyx-lobes; capsule ovoid, 4–4.5 mm. high, scarcely longer than the calyx.

Borders of Lake Guanica, and seashore at Punta Cangrejos, Porto Rico; Icacos:—Atlantic coast of the United States; Texas; Bahamas; Cuba. SLENDER SEA PURSLANE.

2. **Sesuvium Portulacastrum** L. Syst. ed. 10, 1058. 1759.

Portulaca Portulacastrum L. Sp. 446. 1753.

Trianthema polyandrum Blume, Bijdr. 1137. 1826.

Halimus Portulacastrum Kuntze, Rev. Gen. Pl. 263. 1891.

Perennial, fleshy, glabrous. Stems usually diffusely branched, the branches prostrate, often creeping, forming large patches; leaves oblanceolate to oblong, 1.5–4.5 cm. long, acute or acutish, the bases clasping; flowers pedicelled, solitary in the axils; calyx-lobes lanceolate, 7–10 mm. long, hooded, purple within, the back prolonged into an appendage; stamens numerous; capsule conic, 8–10 mm. long.

Saline soil along the coasts, Porto Rico; Mona; Icacos; Vieques; St. Croix; St. Thomas; St. Jan:—coasts of the southeastern United States; Bermuda; West Indies; continental tropical America and Old World tropics. SEA PURSLANE. YERBA DE VIDRIO.

3. **TRIANTHEMA** [Sauvag.] L. Sp. Pl. 223. 1753.

Fleshy diffuse or prostrate herbs, with opposite unequal petioled leaves, and small sessile or stalked axillary flowers. Calyx 5-lobed, the lobes often appendaged on the back below the apex. Petals none. Stamens 5–10 or more. Ovary 1- or 2-celled, few-ovuled; styles 1 or 2. Capsule membranous or coriaceous, turbinate or cylindrical, at length circumscissile. Seeds reniform; embryo annular. [Greek, three flowers, named for some species having three flowers in the axils of the leaves.] About 17 species, widely distributed in the tropics. Type species: *Trianthema Portulacastrum* L.

1. **Trianthema Portulacastrum** L. Sp. Pl. 223. 1753.

Trianthema monogynum L. Mant. 1: 69. 1767.

A nearly prostrate, much-branched perennial herb, the branches sometimes 10 dm. long. Leaves broadly obovate, elliptic or suborbicular, 1–4.5 cm. long, 0.3–3.3 cm. broad, rounded, notched or apiculate at the apex, acute or sometimes rounded at the base, the petioles 0.5–2.5 cm. long; flowers sessile in the axils, partly concealed within the petiolar sheath, the sepals ovate-lanceolate, 3–5 mm. long, rosy purplish within; capsule 4–5 mm. long, crested.

Waste grounds at lower elevations, Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; Tortola:—Jamaica; Cuba to Trinidad; Margarita; Bonaire; Curaçao; Aruba; warm temperate and tropical continental America; Old World tropics.

4. **CYPSELEA** Turp. Ann. Mus. Paris 7: 219. 1806.

Small, somewhat fleshy, prostrate herbs, with slender branched stems and small axillary flowers. Leaves opposite, those of a pair unequal. Stipules scarious, laciniate. Calyx 5-lobed, the lobes unappendaged. Petals none. Stamens 2 or 3, alternate with the calyx-lobes. Ovary 1-celled, superior. Styles bifid. Ovules numerous. Capsule 1-celled, circumscissile. Seeds minute. Testa smooth. Embryo curved. [Greek, a bee-hive, from the shape of the capsule.] One species, of warm temperate and tropical America.

1. *Cypselea humifusa* Turp. Ann. Mus. Paris 7: 219. 1806.

Stems much branched, forming mats 3–20 cm. in diameter. Leaves oblong-elliptic to oval, 1.5–10 mm. long, 0.8–5 mm. broad, rounded at the apex, acute or rounded at the base, entire, short-petioled; flowers axillary, greenish, short-pedicelled; calyx-lobes ovate, 1–1.3 mm. long; capsule subglobose, 1–1.6 mm. in diameter.

In damp soil, Water Island, St. Thomas; Anegada:—Cuba; Hispaniola; Guadeloupe; Margarita; southern Florida and California.

Tetragonia expansa Murr., NEW ZEALAND SPINACH, native of New Zealand, occasionally grown in Porto Rican gardens, is a nearly prostrate, somewhat fleshy herb, the stems 5–8 dm. long, the alternate entire rhombic-ovate leaves 2.5–8 cm. long, the flowers solitary, axillary, 5–6 mm. wide, the fruit obovoid, 4-horned, about 10 mm. thick.

Mesembryanthemum angustum Haw., of South Africa, grown from Palermo Botanical Garden seed by Mr. A. S. Fairchild at Louisenhøj, St. Thomas, and established in 1923, has tufted, half-cylindric, linear, various leaves in alternate pairs, the yellow flowers nearly sessile.

Mesembryanthemum nodiflorum L., of the Mediterranean region, was grown from seed by Mr. Fairchild from the same source.

Mesembryanthemum uncinellum Salm-Dyck, South African, sent to Louisenhøj from the New York Botanical Garden, was well established in 1923.

Family 7. **ALSINACEAE** Wahl.

CHICKWEED FAMILY.

Annual or perennial herbs, with opposite entire leaves, estipulate or stipulate, and mostly small perfect flowers, solitary or in cymes or umbels. Calyx of 4 or 5 sepals, imbricated, at least in the bud, separate to the base, or nearly so. Petals as many as the sepals, not clawed, rarely wanting. Stamens 8 or 10, or fewer, inserted at the base of the sessile ovary, or on a small disk; filaments distinct, or cohering below; anthers longitudinally dehiscent. Ovary usually 1-celled; styles 2–5, distinct or united; ovules several or numerous, amphitropous or campylotropous, borne on a central column. Fruit a capsule, dehiscent by valves or by apical teeth. Embryo mostly curved and with incumbent cotyledons. About 32 genera and 500 species, of wide distribution, most abundant in temperate regions.

Styles united below.
Styles separate to the base.

1. *Drymaria*.
2. *Alsine*.

1. **DRYMARIA** Willd.; R. & S. Syst. 5: 406. 1819.

Low branching herbs, with flat leaves, small, often fugacious stipules, and mostly white flowers in cymes or solitary. Sepals 5, distinct. Petals 5, cleft. Stamens 5 or fewer. Ovary 1-celled; styles mostly 3, united below. Fruit a 3-valved capsule. Seeds globose-reniform, the embryo peripheral. [Greek, pertaining to the forest.] About 40 species, of tropical and subtropical America, one also in the Old World tropics. Type species: *Drymaria arenarioides* H. & B.

1. *Drymaria cordata* (L.) Willd.; R. & S. Syst. 5: 406. 1819.*Holosteum cordatum* L. Sp. Pl. 88. 1753.*Holosteum diandrum* Sw. Prodr. 27. 1788.*Drymaria cordata diandra* Eggers, Bull. U. S. Nat. Mus. 13: 27. 1879.*Drymaria ramosissima* Kuntze, Rev. Gen. 1: 50. 1891. Not Schlecht. 1838.

Annual, glabrous, or puberulent above; stems very slender, diffuse, 1-4 dm. or more long. Leaves orbicular or broader than long, 6-24 mm. wide, membranous, palmately veined, rounded or acute at the apex, commonly subcordate at the base, short-petioled; peduncles filiform, usually much longer than the leaves, often forked; cymes few-several-flowered; pedicels as long as the bractlets or shorter; sepals 1.5-3 mm. long, oblong-lanceolate, acute; petals 2-cleft; capsule about as long as the sepals; seeds 1 mm. long, granulose.

Moist grounds, river-banks and woodlands, Porto Rico, mostly in wet or moist districts; St. Croix; St. Thomas:—Florida; West Indies; continental tropical America. DRYMARIA. YERBA DE ESTRELLA.

2. **ALSINE** [Tourn.] L. Sp. Pl. 274. 1753.

[STELLARIA L. Sp. Pl. 421. 1753.]

Herbs, with cymose white flowers. Sepals 4 or 5. Petals 4 or 5, 2-cleft, 2-parted, or emarginate, white in our species, rarely none. Stamens 10 or fewer, hypogynous. Ovary 1-celled; styles commonly 3, rarely 4 or 5, usually opposite the sepals. Capsule dehiscent by twice as many valves as there are styles. [Greek, grove, the habitat of some species.] Species about 75, widely distributed, most abundant in temperate or cold climates. Type species: *Alsine media* L.

1. *Alsine antillana* (Urban) Britton & Wilson.*Stellaria antillana* Urban, Symb. Ant. 1: 303. 1899.*Drymaria laxiflora pauciflora* Kuntze, Rev. Gen. Pl. 1: 50. 1891. Not Benth.

Stem slender, creeping, branched, often rooting at the nodes, angled, glabrous or nearly so. Leaves ovate to rhombic-ovate or rhombic-elliptic, 4-18 mm. long, 3-12 mm. broad, acuminate or mucronate at the apex, abruptly narrowed at the base into the petiole; petioles 1.5-2 mm. long; peduncles axillary, solitary, slender, 1.5-3 cm. long; flowers 4-merous or sometimes 5-merous; sepals ovate, 2-3 mm. long; petals 2-cleft; capsule about 3 mm. long; seeds 0.9 mm. in diameter, dark brown, echinate. [*Stellaria ovata* of Bello, not of Willdenow.]

Moist shaded situations at middle and higher elevations. Porto Rico, descending to 350 m.:—Hispaniola. WEST INDIAN CHICKWEED. PEGA-POLLO.

Dianthus Caryophyllus L., CARNATION, originally European or Asiatic, of the related family **Caryophyllaceae**, grown for its flowers in Porto Rico and Virgin Island gardens, has tufted rather stiff stems up to 1 m. high, linear 5-nerved leaves, the large fragrant flowers rose, purple or white, the calyx subtended by 4 broad appressed short-tipped bracts, the petals variously erose.

Dianthus chinensis L., of China and Japan, listed by Krebs as formerly grown in St. Thomas, has pink or lilac flowers with spreading calyx-bracts.

Saponaria officinalis L., SOAPWORT, European, also of the family Caryophyllaceae, listed by Krebs in 1851 as found in St. Thomas, may have been a temporary garden flower. It is an herb with opposite ovate or oval leaves, the large white flowers in terminal corymbs, the nearly tubular calyx 5-toothed.

Family 8. **PORTULACACEAE** Rehb.

PURSLANE FAMILY.

Herbs, rarely somewhat woody, with regular perfect but unsymmetrical flowers. Sepals 2. Petals 4-6, rarely more, hypogynous, imbricated. Stamens hypogynous, equal in number to the petals or fewer, rarely more; filaments filiform; anthers 2-celled, longitudinally dehiscent. Ovary 1-celled; style with 3-7 stigmatic branches; ovules 2-many, amphitropous. Capsule circumscissile, or dehiscent by 3 valves. Seeds 2-many, reniform-globose or compressed; embryo curved. About 20 genera and 180 species, mostly natives of America.

Calyx free from the ovary; capsule 3-valved; flowers racemose or paniculate.

1. *Talinum*.

Calyx partly adnate to the ovary; capsule circumscissile; flowers solitary or clustered at the ends of the branches.

2. *Portulaca*.1. **TALINUM** Adans. Fam. Pl. 2: 245. 1763.

Fleshy glabrous erect or ascending herbs, with alternate estipulate leaves. Sepals herbaceous, deciduous or persistent. Petals 5, hypogynous, fugacious. Stamens 10-30, adherent to the bases of the petals. Ovary free, many-ovuled; style 3-lobed or 3-cleft. Capsule 3-valved. Seeds numerous, borne on a central globose placenta. [Aboriginal name of a Senegal species.] A genus of about 15 species, natives mostly of America. Type species: *Portulaca triangularis* Jacq.

Inflorescence paniculate; petals 4-5 mm. long.

1. *T. paniculatum*.

Inflorescence racemose or subcorymbose; petals 6-9 mm. long.

2. *T. triangulare*.1. **Talinum paniculatum** (Jacq.) Gaertn. Fr. & Sem. 2: 219. 1791.

Portulaca paniculata Jacq. Enum. 22. 1760.

Portulaca patens Jacq. Hort. Vind. 2: 71. 1772.

Talinum patens Willd. Sp. Pl. 2: 863. 1800.

Claytonia patens Kuntze, Rev. Gen. Pl. 57. 1891.

Stems rather slender, 3-7.5 dm. high, simple or branched. Leaves elliptic or obovate, 3-8 cm. long, 1.5-4 cm. broad, obtuse or sometimes acute at the apex, tapering at the base into the petiole; panicle 7-25 cm. long; pedicels slender, terete; sepals deciduous, 3-4 mm. long; petals red, pink or yellowish, 4-5 mm. long; stamens 15-20; capsule 3-4.5 mm. in diameter; seeds 1-1.2 mm. broad, black, shining.

Rocky and sandy soil, Porto Rico; Mona; Desecheo; Vieques; St. Croix; St. Jan; St. Thomas; Virgin Gorda; Tortola:—Cuba to Margarita; southern United States and continental tropical America.

2. **Talinum triangulare** (Jacq.) Willd. Sp. Pl. 2: 862. 1800.

Portulaca triangularis Jacq. Enum. 22. 1760.

Portulaca racemosa L. Sp. Pl. ed. 2, 640. 1762.

Talinum crassifolium Willd. Sp. Pl. 862. 1800.

Talinum racemosum Rohrb. in Mart. Fl. Bras. 15²: 297. 1872.

Claytonia triangularis Kuntze, Rev. Gen. Pl. 56. 1891.

Stems stout, fleshy, sometimes 6 dm. high. Leaves oblanceolate to obovate, 2-8 cm. long, 1-3.2 cm. broad, rounded or acute at the apex, tapering at the base into the petiole; racemes few- or many-flowered; pedicels angled; sepals persistent, about 5 mm. long; petals red, yellow or whitish, broadly elliptic, 6-9 mm. long, 6 mm. broad; stamens about 30; capsule 4.5-6 mm. in diameter; seeds 0.8 mm. broad, shining.

Rocky soil at lower and middle elevations, Porto Rico, often near the coast; Culebra; St. Thomas; St. Croix:—Jamaica; St. Barts; Guadeloupe to Margarita; South America.

2. **PORTULACA** [Tourn.] L. Sp. Pl. 445. 1753.

Diffuse or ascending, glabrous or pubescent succulent herbs, with terminal flowers. Sepals 2, united at the base and partly adnate to the ovary. Petals 4-6 (mainly 5), inserted on the calyx, fugacious. Stamens 7-25, inserted at the base of the petals. Ovary many-ovuled; style deeply 3-9-cleft or -parted. Capsule membranous, dehiscent by a lid, many-seeded. [Latin, in allusion to the purging qualities of some of the species.] A genus of over 30 species, mostly natives of America. Type species: *Portulaca oleracea* L.

Flowers yellow.

Seeds black or grayish black.

Leaves flat.

Leaves alternate, obovate, 7-30 mm. long.

Leaves opposite, mostly elliptic or ovate, 3-6 mm. long.

Leaves obovoid or cylindrical.

Leaves obovoid.

Leaves linear.

Seeds brown; leaves linear, subterete.

Flowers purplish; leaves linear, subterete.

Seeds black.

Seeds gray.

1. *P. oleracea*.

2. *P. quadrifida*.

3. *P. caulerpoides*.

4. *P. halimoides*.

5. *P. phaeosperma*.

6. *P. pilosa*.

7. *P. poliosperma*.

1. **Portulaca oleracea** L. Sp. Pl. 445. 1753.

Portulaca parvifolia Haw. Syn. Succ. 122. 1812.

Portulaca oleracea parvifolia Griseb. Fl. Br. W. I. 707. 1864.

Portulaca oleracea macrantha Eggers, Bull. U. S. Nat. Mus. 13: 27. 1879.

Portulaca oleracea micrantha Eggers, loc. cit. 27. 1879.

A glabrous annual, with prostrate or ascending branches. Leaves alternate, flat, obovate, or cuneate, 7-30 mm. long, 3-13 mm. broad, rounded at the apex, very fleshy; flowers clustered or solitary, sessile; sepals keeled, acutish; corolla yellow; petals longer than the sepals, very delicate and soon withering; stamens 7-12; styles 4-6; capsule 4-7 mm. long, circumscissile at about the middle; seeds black, 0.7-0.8 mm. in diameter; finely tuberculate.

Rocky and sandy soil and waste places, Porto Rico; Mona; Desecheo; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—all temperate and tropical regions. PURSLANE. VERDOLAGA.

2. **Portulaca quadrifida** L. Mant. 1: 73. 1767.

A prostrate, much-branched annual, creeping and rooting at the nodes, with slender stems and long white hairs encircling the nodes. Leaves opposite, flat, elliptic-ovate to ovate or oval, 3-6 mm. long, 1.2-3 mm. broad, acute or obtuse at the apex, rounded or acutish at the base, short-petioled; flowers terminal, solitary, sessile, surrounded with long white hairs, and an involucre of 4 leaves; sepals oblong-oval, obtuse; corolla yellow; petals elliptic to oval, obtuse; stamens 8-12; style filiform; capsule circumscissile above the base; seeds gray, 0.8-10 mm. in diameter.

Roadside banks, waste grounds and coastal plains, southwestern dry districts of Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan; Tortola:—Cuba to Trinidad; South America. Native of tropical Asia. The flowers open about noon. CHICKEN-WEED.

3. **Portulaca caulerpoides** Britton & Wilson, Bull. Torr. Bot. Club 42: 515. 1915.

Perennial, prostrate, forming tufts 8-12 cm. in diameter; stems slender, branched, hairy in the axils. Leaves fleshy, obovoid, 3-5 mm. long, 2-3 mm. broad, not at all flattened, rounded at the apex, narrowed at the base, subsessile, glabrous, shining, with labyrinthine or tortuous mottling; flowers terminal, solitary, sessile; sepals oval; corolla pale yellowish-white; petals broadly obovate, 2.5-3 mm. long, 2-2.5 mm. broad, notched at the apex; seeds reniform, black, 0.5 mm. broad, rugulose.

Limestone rocks, Cayo Muertos. Endemic.

4. *Portulaca halimoides* L. Sp. Pl. ed. 2, 639. 1762.

A much-branched annual, sometimes 15 cm. high; branches erect or diffuse, with tufts of white axillary hairs. Leaves fleshy, subcylindric, 6–15 mm. long, 1.5–2.5 mm. broad, often acutish at the apex; flowers terminal, encircled by numerous white hairs; sepals about 2 mm. long; corolla white with a yellow center; petals ovate or ovate-elliptic, 3 mm. long, 1.2–1.3 mm. broad; stamens 8–20; capsule circumscissile below the middle; seeds black, 0.4 mm. broad, tuberculate. [? *P. rubricaulis* of Krebs.]

Fields, coastal sands and rocks, Porto Rico, in the southwestern dry districts; St. Croix; St. Thomas; St. Jan; Virgin Gorda; Anegada;—Cuba; Hispaniola; St. Martin to Guadeloupe; Bonaire; Curaçao; Aruba; Mexico.

5. *Portulaca phaeosperma* Urban, Symb. Ant. 4: 233. 1905.

A fleshy herb; branches ascending, 2.5 dm. long or less, the tufts of axillary hairs often rather inconspicuous. Leaves linear or linear-oblong, subterete, acute or obtuse, 5–16 mm. long, 2–3.5 mm. thick, alternate and often clustered at the ends of the branches; flowers terminal, encircled by long brownish hairs; sepals about 4 mm. long; corolla yellow; petals oblong to ovate-oblong or somewhat obovate, obtuse or acutish; stamens 12–16; capsule subglobose, 3–5 mm. in diameter; circumscissile above the middle; seeds rugulose, 0.5–0.6 mm. in diameter, brown.

Rocky soil, Porto Rico, near the southern coast; Mona; St. Thomas; St. Croix; Virgin Gorda;—Florida; Bahamas; Cuba; Hispaniola; Jamaica; Curaçao.

6. *Portulaca pilosa* L. Sp. Pl. 445. 1753.

Stems ascending or prostrate, often conspicuously pilose-pubescent with tufts of long brown or whitish hairs in the axils. Leaves linear-subulate, nearly terete, acute, 8–16 mm. long, 1.5–3 mm. broad, alternate; flowers terminal, encircled by long white or brown hairs; sepals linear-oblong, obtuse, 2–3 mm. long; corolla red or purple; stamens 15 or more, the filaments crimson; style 5–6-parted; capsule circumscissile at about the middle, covered by the withered corolla; seeds 0.3–0.4 mm. in diameter, black, minutely tuberculate.

Sandy and rocky soil at low elevations, Porto Rico; St. Croix; St. Thomas;—Cuba to Trinidad; Florida; Mexico, and South America.

7. *Portulaca poliosperma* Urban, Symb. Ant. 4: 232. 1905.

Portulaca poliosperma minor Urban, loc. cit. 4: 233. 1905.

An annual herb with spreading branches, the axillary hairs few and rather short. Leaves linear, 5–13 mm. long, 1–1.8 mm. broad, obtuse; flowers solitary or several, terminal, encircled by whitish or brownish hairs; sepals 2.5–2.8 mm. long; corolla purple; petals oblong, obtuse; capsule broadly ellipsoid, 4–5 mm. long, 3–3.5 mm. thick, circumscissile at about the middle; seeds 0.6–7 mm. broad, gray, tuberculate.

Sandy soil, northern coastal plain of Porto Rico;—Cuba; St. Martin; Curaçao.

Portulaca brasiliensis West, of St. Croix, is not described; it is probably referable to one of the preceding.

Limnia perfoliata (Donn) Haw., a native annual of western North America, was recorded by Krebs as found in St. Thomas, but this is wholly improbable, unless grown from seed; it could not endure the climate. [*Claytonia perfoliata* Donn.]

Family 9. **BASELLACEAE.****BASELLA FAMILY.**

More or less succulent vines with alternate, entire leaves. Flowers small, perfect, in axillary and terminal spikes or spike-like racemes. Sepals 2, sometimes winged in fruit. Petals 5. Stamens 5, opposite the petals; filaments terete or flattened; anthers versatile. Ovary superior, 1-celled; ovule solitary; styles 3, distinct; stigmas entire or cleft. Fruit indehiscent. Seeds erect, with a membranous testa. About 5 genera and 15 species of tropical distribution, mostly American.

1. BOUSSINGAULTIA H.B.K. Nov. Gen. 7: 194. 1825.

Branching vines with tuberous roots; the leaves rather fleshy. Flowers in axillary and terminal simple or branched spike-like racemes. Sepals not winged. Petals white or greenish-white, spreading. Stigmas cleft. Seeds with starchy endosperm. Cotyledons plano-convex. [Commemorates John Baptiste Boussingault, chemist and physicist, professor in Bogota.] About 10 species, natives of tropical America. Type species: *Boussingaultia baselloides* H.B.K.

1. Boussingaultia leptostachys Moq. in DC. Prodr. 13²: 229. 1849.

A glabrous vine with slender stems and branches. Leaves ovate to elliptic, 2-6 cm. long, 1.5-4 cm. broad, acute to acuminate at the apex, gradually or abruptly narrowed at the base, short-petioled; racemes lax, much longer than the leaves; bracts linear-acuminate, 1.5 mm. long; pedicels 1-1.2 mm. long; flowers white; bracteoles triangular-cuspidate, 0.5 mm. long; sepals 1-nerved; petals 2-2.5 mm. long.

Woods and thickets in moist districts, Porto Rico; St. Thomas; St. Croix; Tortola:—Cuba; Jamaica; Hispaniola; Guadeloupe; Dominica; Martinique; Florida and continental tropical America. Recorded by Bello as *Anredera scandens*. SUELDA-CONSUELDA.

Boussingaultia baselloides H.B.K., MADEIRA VINE, recorded as grown for ornament in Porto Rico, is a similar vine with larger cordate leaves.

Basella rubra L., MALABAR NIGHTSHADE, Asiatic, grown for its edible foliage in Porto Rico and Virgin Island gardens, is a succulent, annual or biennial vine up to 1 m. long or longer, with ovate entire petioled leaves 5-7 cm. long, the small flowers spicate, sessile, white, red or violet [*B. alba* L.].

Order 11. RANALES.

Herbs, vines, shrubs or trees. Calyx present, usually of separate sepals. Corolla usually present and of separate petals. Ovary or ovaries superior, free from the calyx; carpels 1 to many, usually separate. Stamens mostly hypogynous and more numerous than the sepals.

Aquatic herbs.

Plants with minute sessile monoecious flowers; involucre 8-12-cleft; perianth none; leaves cauline, submerged, crowded in whorls, sessile.

Plants with small or large, long-peduncled flowers; sepals and petals present.

Carpels not borne in a fleshy receptacle; leaves cauline, of two kinds, the submerged opposite or whorled, dissected into capillary segments, the floating leaves when present few, peltate.

Carpels immersed in a fleshy receptacle; leaves arising from a large horizontal rootstock, floating or emersed, the blades broadly elliptic to sub-orbicular.

1. CERATOPHYLLACEAE.

2. CABOMBACEAE.

3. NYMPHAEACEAE.

Woody plants or terrestrial herbs.

Leaves compound, opposite; flowers dioecious or polygamous.

Our species a vine; the leaves trifoliate; achenes with plumose styles.

Tree; leaves pinnate; follicles 2-valved.

Leaves simple, mostly alternate, sometimes none or reduced to scales.

Anthers not opening by valves.

Flowers dioecious; mostly vines; fruit a drupe.

Flowers perfect; trees or shrubs.

Sepals and petals imbricate; carpels coherent, opening on the back, forming a fleshy or woody, cone-like fruit.

Sepals and petals valvate; carpels separate or coherent, forming a drupe-like or berry-like fruit.

Anthers opening by valves.

Leafy trees or shrubs.

Perianth superior.

Perianth inferior.

Leafless, twining, parasitic vines.

4. RANUNCULACEAE.

5. BRUNELLIACEAE.

6. MENISPERMACEAE.

7. MAGNOLIACEAE.

8. ANNONACEAE.

9. HERNANDIACEAE.

10. LAURACEAE.

11. CASSYTHACEAE.

Family 1. **CERATOPHYLLACEAE** A. Gray.

HORNWORT FAMILY.

Submerged aquatic herbs, with branching stems and whorled, rigid, finely dissected leaves. Flowers small, monoecious, solitary and sessile in the axils of the whorls. Involucre 8-12-cleft. Perianth none. Stamens many, crowded on a flat or convex receptacle; anthers sessile or nearly so, linear-oblong, the connective prolonged into an often 2-3-toothed, fleshy appendage. Pistillate flowers with a sessile, 1-celled ovary; ovule 1, pendulous; style filiform, stigmatic at the summit. Fruit an indehiscent nut. Endosperm wanting. Embryo with a very short radicle, thick oval cotyledons, and a plumule consisting of several nodes and leaves.

The family contains only the following genus:

1. **CERATOPHYLLUM** L. Sp. Pl. 992. 1753.

Leaves sessile, crowded in verticils, cut into two- or three-forked thread-like often spinulose-serrulate divisions. Sterile flowers with 10-24 stamens, the anthers large. Fertile and sterile flowers generally at different nodes, occasionally in opposite axils at the same node. Ovary somewhat longer than the involucre. Fruit beaked with the long persistent style. [Greek, horny-leaf.] About two species, widely distributed in fresh-water, the following typical.

1. **Ceratophyllum demersum** L. Sp. Pl. 992. 1753.

Ceratophyllum submersum L. Sp. Pl. ed. 2, 1409. 1763.

Stem 5-12 dm. long, branching. Leaves rather stiff, 6-12 in a whorl; fruit oval, 4-5 mm. long, 3-3.5 mm. broad, with a slender straight or curved spine-like beak 5-6 mm. long, smooth and spurless or with a long basal spur on each side, or tuberculate and with narrowly winged spiny margins or broadly winged without spines.

Fresh-water lakes and streams, Porto Rico; St. Thomas:—Cuba, Jamaica; Hispaniola; Martinique; Barbadoes; Trinidad; temperate and tropical regions of the world. **HORNWORT.**

Family 2. **CABOMBACEAE** A. Gray.

WATER-SHIELD FAMILY.

Perennial aquatic caulescent herbs, with gelatine-coated stems, floating or immersed leaves, and solitary axillary flowers. Sepals 3, rarely 4.

Petals 3, rarely 4. Stamens 3-18. Carpels 2-18, distinct. Stigmas sessile or nearly so. Ovules 2 or 3, orthotropous. Fruits indehiscent, coriaceous, separate. Seeds 1-3 borne on the dorsal suture. Embryo at the base of fleshy endosperm. Cotyledons fleshy. Two genera and about 5 species, widely distributed in fresh-water lakes and streams.

1. **CABOMBA** Aubl. Pl. Guian. 1: 321. 1775.

Stems slender, mainly submerged. Leaves of two kinds, the submerged opposite, or verticillate, palmately dissected into numerous capillary segments, the floating leaves when present few, alternate and centrally peltate. Flowers small, white, or purple. Sepals 3. Petals 3. Stamens 3-6; filaments slender; anthers short, extrorse. Carpels 2-4. Stigmas small, terminal; ovules commonly 3, pendulous. Fruit coriaceous, indehiscent, 2- or 3-seeded. [Guiana name.] A genus of about 4 species, natives of the warmer parts of America. Type species: *Cabomba aquatica* Aubl.

1. **Cabomba piauihyensis** Gardn.; Hook. Ic. Pl. 7: pl. 641. 1844.

Stem slender, 5 dm. or more long. Submerged leaves opposite or occasionally verticillate, usually long-petioled, 2-4 cm. broad, much divided; floating leaves linear, peltate; flowers purple, long-peduncled from the upper axils; sepals oblong, 6-6.7 mm. long, 2.5-3 mm. broad; petals oblong to elliptic-oblong, about as long as the sepals; carpels flask-shaped, more or less echinate.

Fresh-water lagoons and streams, Porto Rico;—Cuba; Trinidad; Brazil.

Family 3. **NYMPHAEACEAE** DC.

WATER-LILY FAMILY.

Aquatic herbs, with more or less elongated, often tuber-bearing rootstocks. Leaves floating or erect, or sometimes submersed. Flowers perfect, terminating elongated scapes. Sepals 4-6, often green. Petals few or numerous, usually passing into staminodes or stamens. Stamens numerous; anthers erect, the connective continuous with the filament. Gynoecium of several or many carpels united into a compound ovary. Stigmas united into a disk with radiating stigmatic lines. Ovules numerous, pendulous. Fruit indehiscent. Seeds often enveloped by a sack-like aril; cotyledons fleshy; hypocotyl very short. Five genera and over 60 species, widely distributed in fresh-water lakes and streams.

1. **CASTALIA** Salisb. Par. Lond. 1: pl. 14. 1805.

Herbs with horizontal perennial rootstocks, floating leaves and often large showy flowers. Sepals 4. Petals in several rows, or but few, inserted on the receptacle; gradually passing into the stamens. Stamens numerous, the exterior with large petaloid filaments and short anthers, the interior with linear filaments and elongated anthers. Carpels several, united into a compound pistil with radiating linear projecting stigmas. Fruit covered with the bases of the petals, ripening under water. [A spring on Parnassus, sacred to Apollo and the Muses.] About 50 species, of wide geographic distribution, known as *FLOR DE AGUA*, *YERBA DE HICOTEA*, *WATER-LILY*. Type species: *Castalia magnifica* Salisb.

Flowers diurnal.

Carpels free from one another at the sides; styles short, stiff and fleshy.

Leaves coarsely sinuate-dentate; flowers 8–16 cm. broad; petals 12–21.

Leaves entire or slightly undulate; flowers mostly less than 8 cm. in diameter; petals 4–8.

Carpels united by their sides; styles ligulate.

Flowers nocturnal; carpels united by their sides; styles slender, with enlarged club-shaped tips.

Petioles with a ring of long hairs at the top; leaves entire.

Petioles without a ring of hairs at the top.

Leaves coarsely sinuate-dentate.

Leaves entire.

1. *C. ampla*.

2. *C. pulchella*.

3. *C. odorata*.

4. *C. amazonum*.

5. *C. Rudgeana*.

6. *C. Jamesoniana*.

1. ***Castalia ampla*** Salisb. Par. Lond. 1: pl. 14. 1805.

Nymphaea ampla DC. Syst. 2: 54. 1821.

Nymphaea speciosa Mart. & Zucc. Abhand. Muench. Akad. 1: 368. 1832.

Nymphaea ampla Plumieri Planch. Ann. Sci. Nat. III. 19: 44. 1853.

Nymphaea ampla speciosa Casp. in Mart. Fl. Bras. 4²: 158. 1878.

Leucorynphaea ampla Kuntze, Rev. Gen. Pl. 11. 1891.

Leaves suborbicular, 15–45 cm. in diameter, coarsely sinuate-dentate or nearly entire, red-purple beneath and often marked with purplish-black blotches, the basal lobes acute. Flowers diurnal, raised above the water, 8–16 cm. broad; sepals oblong-lanceolate, obtuse or acutish, the outer surface green, marked with purplish-black lines; petals 12–21, oblong-lanceolate, obtuse; stamens 90–190, the outer long-appendaged; carpels 14–23, free from one another at the sides; styles short, stiff and fleshy.

Fresh-water lagoons and streams, Porto Rico; St. Croix;—West Indies; Texas and continental tropical America.

2. ***Castalia pulchella*** (DC.) Britton, Bull. N. Y. Bot. Gard. 4: 138. 1906.

Nymphaea pulchella DC. Syst. 2: 51. 1821.

? *Nymphaea ampla parviflora* Griseb. Fl. Br. W. I. 11. 1859.

Nymphaea ampla pulchella Casp. in Mart. Fl. Bras. 4²: 159. 1878.

Similar to the preceding. Leaves suborbicular, 8–20 cm. or sometimes more in diameter, often green on both sides, the margin slightly undulate or subentire. Flowers small; sepals oblong-lanceolate, 6 mm. long or less; petals 4–8, white, acute; stamens 30–50, the outer long-appendaged; carpels free from one another at the sides; styles short, stiff and fleshy; fruit 2–3 cm. in diameter.

Fresh-water lakes and ponds, Porto Rico; Vieques (according to Eggers); St. Croix (according to Urban);—Bahamas; Cuba; Hispaniola; Jamaica; South America. Recorded by Bello as *Nymphaea minor* DC.

3. ***Castalia odorata*** (Dryand.) Woodv. & Wood, in Rees' Cyclop. 6: no. 1. 1806.

Nymphaea odorata Dryand.; Ait. Hort. Kew. 2: 227. 1789.

Leaves suborbicular, 8–20 cm. or more in diameter, green above, often purplish and somewhat pubescent beneath, the sinuses opened or closed. Flowers diurnal, usually floating, white or sometimes pinkish, sweet-scented, 7–15 cm. in diameter; sepals lanceolate to ovate, rounded or obtuse at the apex, narrowed at the base, the outside green, more or less shaded with reddish-brown, the inside greenish-white, occasionally tinged with pinkish-purple; petals 23–32, oblong to elliptic or ovate, smaller than the sepals; stamens 55–106, the outer filaments petaloid, the innermost often narrower than the anther; carpels 13–25, united by their sides; styles ligulate; seeds ellipsoid, about 3 mm. long.

Algarrobas, Porto Rico (*J. A. Stevenson 2139*);—Eastern United States; Cuba; Mexico; British Guiana.

4. **Castalia amazonum** (Mart. & Zucc.) Britton & Wilson.

Nymphaea amazonum Mart. & Zucc. Abhand. Muench. Akad. 1: 363. 1832.

Nymphaea Rudgeana amazonum Griseb. Fl. Br. W. I. 12. 1859.

Leuconymphaea amazonum Kuntze, Rev. Gen. Pl. 11. 1891.

Leaves suborbicular, 9–17 cm. wide, entire, brownish-red beneath and often marked with small purplish-black blotches, the petioles bearing a ring of long hairs at the top. Flowers floating, nocturnal, faintly malodorous, 8–14 cm. in diameter; sepals elliptic or elliptic-ovate, acute or obtuse; petals 16–20, oblong or ovate, greenish cream-color; stamens 100–188, occasionally more or fewer; the outer not long-appendaged; carpels 25–35, completely united by their sides; styles slender with enlarged red club-shaped tips; fruit subspherical, about 4 cm. in diameter.

Lagoons and canals, northern districts of Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe; Martinique; Tobago; Trinidad; South America. Recorded by Bello as *Nymphaea Rudgeana* Meyer.

5. **Castalia Rudgeana** (G. F. W. Meyer) Britton & Wilson.

Nymphaea Rudgeana G. F. W. Meyer. Prim. Fl. Esseq. 198. 1818.

Leaves elliptic to suborbicular, 15–30 cm. or more broad, coarsely sinuate-dentate, with unequal distant teeth, often somewhat reddish-brown beneath; the petioles without a ring of hairs at the top. Flowers nocturnal, 6.5–15 cm. in diameter; sepals ovate-oblong, acute or obtuse; petals 12–32, elliptic to oblong-lanceolate, greenish yellow; stamens 40–80, the outer not long-appendaged; carpels 11–24, united by their sides; styles slender with enlarged, club-shaped tips; fruit depressed-globose, truncate.

Porto Rico (according to Conard):—Cuba; Jamaica; Martinique; Trinidad; South America.

6. **Castalia Jamesoniana** (Planch.) Britton & Wilson.

Nymphaea Jamesoniana Planch. Revue Hort. IV. 2: 66. 1853.

Leuconymphaea Jamesoniana Kuntze, Rev. Gen. Pl. 11. 1891.

Leaves ovate-cordate, entire, the under surface marked with dark purple, forked and branching lines. Flowers 8–10.5 cm. wide; sepals lanceolate-ovate, green, marked from base to apex with long narrow dark crimson lines; petals 16, oblong, those of the outer whorls obtuse, of the inner whorl acute; stamens 52–65, the outer not long-appendaged; carpels about 30, united by their sides; styles slender, with club-shaped tips.

Ditches, Hatillo near Añasco, Porto Rico:—Cuba; Hispaniola; Ecuador.

Castalia zanzibarensis (Casp.) Britton, ZANZIBAR WATER-LILY, grown by Mr. Fairchild at Louisenhøj, St. Thomas, has ovate-orbicular, sinuate leaves with a deep basal sinus, and long-peduncled, erect, bright blue flowers.

Family 4. **RANUNCULACEAE** Juss.

CROWFOOT FAMILY.

Annual or perennial herbs, or shrubby climbers. Leaves alternate or opposite, simple or compound, frequently dissected, their stalks dilated at the base, occasionally with stipule-like appendages. Flowers regular or irregular. Sepals 3–15, generally caducous, often petal-like. Petals about as many as the sepals, occasionally more or wanting. Stamens indefinite, rarely few. Carpels numerous, or rarely solitary, 1-celled, 1-many-ovuled. Ovules anatropous. Seed with endosperm. About 35 genera and 1200 species, distributed throughout the world, not abundant in the tropics.

1. **CLEMATIS** L. Sp. Pl. 543. 1753.

Perennial vines, more or less woody. Leaves opposite, ternately or pinnately compound or simple. Flowers cymose-paniculate, dioecious or polygamo-dioecious. Sepals 4 or 5, valvate in the bud, petaloid. Petals none. Stamens numerous, spreading. Pistils several. Achenes 1-seeded, with silky or plumose styles. [Greek name for some climbing plant.] About 25 species of wide geographic distribution. Type species: *Clematis Vitalba* L.

1. **Clematis dioica** L. Syst. ed. 10, 1084. 1759.

Clematis dominica Lam. Encycl. 2: 45. 1786.

Clematis dioica antillensis Eichl. in Mart. Fl. Bras. 13: 147. 1864.

Clematis dioica normalis Kuntze, Verh. Bot. Ver. Brand. 26: 102. 1885.

Clematis dioica americana Kuntze, loc. cit. 103. 1885.

Clematis virginiana dioica Kuntze, Rev. Gen. 1: 2. 1891.

A rather slender vine, often high-climbing, the stems and foliage more or less densely pubescent or glabrous. Leaves trifoliolate or the uppermost sometimes simple or 3-lobed, the leaflets various, ovate to oval or suborbicular, 3-10 cm. long, 2-7 cm. broad, acute or acuminate at the apex, often rounded and occasionally subcordate at the base, 3-6-nerved, usually long-petioled, the margin entire or with few coarse teeth on each side; flowers greenish-white; sepals oblong or elliptic, 6-9 mm. long, 2.5-3.5 mm. broad, often densely pubescent; pedicels slender, pubescent; achenes about 4 mm. long, the plumose style 3-6 cm. long.

Thickets along streams and on hillsides, Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe; Dominica; Martinique; Tobago; continental tropical America. CABELLOS DE ANGEL.

Family 5. **BRUNELLIACEAE.**

BRUNELLIA FAMILY.

Trees with opposite or whorled, simple or compound leaves. Stipules small, deciduous. Flowers small, dioecious or polygamous, in corymbiform axillary and terminal panicles. Calyx 4- or 5-parted, valvate. Corolla none. Disk 8- or 10-lobed, adnate to the calyx. Staminate flowers: stamens 8 or 10, inserted at the base of the disk; ovaries rudimentary. Pistillate flowers: carpels 4 or 5, distinct, 1-celled; styles subulate; ovules 2, collateral. Follicles 4 or 5, sometimes fewer by abortion, 2-valved, 1- or 2-seeded. Seeds with fleshy endosperm. Cotyledons flat. Only the following genus.

1. **BRUNELLIA** R. & P. Fl. Per. Prodr. 71. 1794.

Characters of the family. About 10 species, natives of tropical America. [Commemorates Gabriele Brunelli, 1728-1797, professor of botany at Bologna. Type species: *Brunellia aculeata* R. & P.

1. **Brunellia comocladifolia** H. & B. Pl. Equin. 1: 211. 1808.

A tree, sometimes 20 m. high, the young branches, petioles and rachis rusty-pubescent, the bark smooth, gray. Leaves odd-pinnate, occasionally equally pinnate through the suppression of the terminal leaflet, 1.5-4 dm. long; leaflets 11-23, oblong-lanceolate or oblong-elliptic, 4.5-15 cm. long, 2.2-6 cm. broad, usually acuminate at the apex, rounded and inequilateral at the base, short-petioled; panicle 5.5-8 cm. long, its branches rusty-pubescent; flowers numerous; calyx 5-cleft, rusty-pubescent, the lobes ovate, about 2.5 mm. long; follicles 3-3.5 mm. long; seeds 2.5 mm. long, 1.5-2 mm. broad.

Mountain forests, western districts of Porto Rico:—Cuba; Jamaica; Hispaniola; Mexico; South America. [*Zanthoxylum acuminatum* of Stahl.] PALO BOBO. WEST INDIAN SUMAC.

Family 6. **MENISPERMACEAE** DC.

MOONSEED FAMILY.

Vines, shrubs or trees, with alternate estipulate leaves, and small dioecious, paniced, racemose or cymose flowers. Sepals 4–12, or fewer. Petals 6, imbricated in 2 rows, sometimes fewer, or none. Stamens about the same number as the petals or fewer. Carpels 1–3 in the West Indian genera; ovule solitary; styles commonly recurved. Fruit drupaceous. Embryo long, curved. About 55 genera and 150 species, mainly of tropical distribution, a few extending into the temperate zones.

Slender vines; pistillate flowers with a rudimentary perianth of 1 sepal, 1 petal and a single carpel.

1. *Cissampelos*.

Woody vines or trees; pistillate flowers with 6 sepals in two series, 6 petals and 3 carpels.

2. *Hyperbaena*.

1. **CISSAMPELOS** L. Sp. Pl. 1031. 1753.

Slender vines, often high-climbing, the leaves broad, mostly entire and cordate, palmately veined, the staminate flowers cymose-paniculate, the pistillate clusters racemose, bracted. Staminate flowers with 4 sepals, the petals united below into a cup, the 2–4 anthers sessile on the peltate top of the stamen-column. Pistillate flowers with a rudimentary scale-like perianth of 1 sepal and 1 petal and a single carpel with a 3-cleft or 3-toothed style. Drupe subglobose, convex; stone compressed, tubercled on the back, concave on both sides. [Greek, ivy-grape.] Perhaps 25 species, of tropical America and tropical and southern Africa. Type species: *Cissampelos Pareira* L.

1. **Cissampelos Pareira** L. Sp. Pl. 1031. 1753.

Cissampelos Caapeba L. Sp. Pl. 1032. 1753.

Cissampelos microcarpa DC. Syst. 1: 534. 1818.

Cissampelos Pareira Caapeba Griseb. Fl. Br. W. I. 11. 1859.

A vine, 3–5 m. long or longer, the young branches, inflorescence and leaves tomentose or glabrous. Leaves suborbicular or broadly ovate, 3.5–10 cm. broad, rounded, acute or emarginate and usually mucronate at the apex, cordate or subtruncate at the base and often peltate, the petioles 2–8 cm. long; staminate inflorescence 7 cm. long or less; sepals 1–1.4 mm. long, the corolla 1–1.5 mm. in diameter; racemes of pistillate flowers 4–12 cm. long, the bracts orbicular, 6–18 mm. broad; pedicels slender; sepal 1–1.4 mm. long, the petal 0.5–0.8 mm. long, 1–1.5 mm. broad; drupe subglobose, 3.5–4.5 mm. in diameter.

Woodlands and thickets, Porto Rico, ascending to higher elevations, Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; Margarita; continental tropical America and Old World tropics. **PARIERA**. BEJUCO DE MONA. VELVET-LEAF.

2. **HYPERBAENA** Miers, Ann. & Mag. Nat. Hist. II. 7: 44. (Hyponym) 1851. Benth. Journ. Linn. Soc. 5: Suppl. 2, 47, 50. 1861.

Woody vines, shrubs or sometimes trees, with leathery leaves. Staminate flowers cymose-paniculate. Pistillate flowers racemose. Sepals 6, in 2 series, the inner much larger than the outer. Petals 6, shorter than the sepals. Stamens 6, free in the staminate flowers. Staminodes 6 in the pistillate flowers. Carpels free, with hook-like styles. Fruit a drupe. Endosperm wanting; cotyledons thick, semi-cylindric; radicle short. [From the Greek to mount or climb.] About 10 species, natives of the West Indies, Central and South America. Type species: *Hyperbaena nemoralis* Miers.

Leaves oblong to lanceolate; drupe subglobose, 2–2.7 cm. in diameter.

1. *H. laurifolia*.

Leaves elliptic to oval or ovate; drupe obovoid, about 1.4–1.8 cm. long, 1–1.3 cm. in diameter.

2. *H. domingensis*.

1. *Hyperbaena laurifolia* (Poir.) Urban, Symb. Ant. 1: 304. 1899.

Cissampelos laurifolius Poir. in Lam. Encycl. 5: 11. 1804.

Anclasma laurifolia Miers, Ann. & Mag. Nat. Hist. III. 14: 260. 1864.

Cocculus laurifolia Eggers, Vidensk. Meddel. 1889: 14. 1890. Not *C. laurifolia* DC. 1818.

A woody vine, 5 m. or more long, or shrub-like. Leaves oblong to lanceolate, 7–19 cm. long, 2.3–6 cm. broad, acute or acuminate at the apex, rounded or acute at the base, glabrous and finely reticulate-veined on both surfaces, the petioles 1.2–2 cm. long; inflorescence equalling or longer or shorter than the petioles, the branches ferruginous-tomentellous; sepals about 1 mm. long; drupe subglobose, laterally flattened, oblique, 2–2.7 cm. in diameter.

Woodlands on limestone hills, northern districts of Porto Rico; St. Thomas;—Jamaica; Montserrat.

2. *Hyperbaena domingensis* (DC.) Benth. Journ. Linn. Soc. 5: Suppl. 2, 50. 1861.

Cocculus domingensis DC. Syst. 1: 528. 1818.

Pachygone domingensis Eichl. in Mart. Fl. Bras. 13¹: 197. 1864.

Hyperbaena retinervis Miers, Ann. & Mag. Nat. Hist. III. 19: 95. 1867.

A woody vine, recorded as sometimes a small tree. Leaves elliptic, oval or ovate, 4–12 cm. long, 2.5–8 cm. broad, acute, acuminate or obtuse at the apex, rounded and sometimes subcordate at the base, finely reticulate-veined on both surfaces, glabrous or slightly pubescent on the veins beneath, the petioles 1.5–4.5 cm. long; inflorescence 5–15 cm. long, the branches rufescent-tomentose; sepals about 1.5 mm. long; drupe obovoid, 1.4–1.8 cm. long, 1–1.2 cm. in diameter.

Forests, Mt. Galso near Adjuntas and Loma la Mina, Sierra de Naguabo, Porto Rico; St. Thomas;—Cuba; Jamaica; Hispaniola; Saba; St. Eustatius; Guadeloupe; Dominica; Martinique; Guiana; Brazil.

Family 7. **MAGNOLIACEAE** J. St. Hil.**MAGNOLIA** FAMILY.

Trees or shrubs with alternate, entire or rarely lobed leaves, large showy flowers and bitter aromatic bark. Sepals and petals arranged in 3 or more series of 3's, hypogynous, deciduous. Stamens usually numerous; anthers adnate. Carpels many, separate or coherent, borne on the surface of the elongated receptacle, ripening into an aggregate fruit composed of 1–2-seeded dry or fleshy follicles or achenes. Seeds 1 or 2 in each carpel, endosperm fleshy; embryo very small. About 10 genera and 75 species, of wide geographic distribution.

1. **MAGNOLIA** L. Sp. Pl. 535. 1753.

Deciduous or evergreen trees or shrubs. Leaves large, chartaceous or coriaceous, entire. Flowers perfect, fragrant or ill-scented, solitary at the ends of branches. Sepals 3, spreading or reflexed. Petals 6–12. Anthers linear, introrse. Carpels coherent, forming a fleshy and often rather woody cone-like fruit, opening on the back. Seeds 1 or 2, fleshy, at length pendulous on a thread. [In honor of Pierre Magnol, 1638–1715, professor of botany at Montpellier.] A genus of about 25 species, natives of eastern North America, the West Indies, Mexico, eastern Asia and the Himalayas. Type species: *Magnolia virginiana* L.

Leaves ovate-elliptic, acute or acuminate.

Leaves oval-orbicular to obovate, abruptly short-acuminate.

1. *M. splendens*.

2. *M. portoricensis*.

1. *Magnolia splendens* Urban, Symb. Ant. 1: 306. 1899.

A forest tree, 15–30 m. tall, the trunk up to nearly 1 m. in diameter, the young branches appressed-pilose or glabrous. Leaves ovate or ovate-elliptic, 10–18 cm. long, 4.5–9 cm. broad, acute or acuminate at the apex, round or acutish at the base, glabrous above, pilose beneath with appressed hairs or glabrous, reticulate-veined on both surfaces, coriaceous; petioles grooved above, 1.8–3 cm. long; sepals obovate-oblong or obovate, 3–3.5 cm. long, 1.5–2.5 cm. broad; petals obovate, 4–4.5 cm. long, 3 cm. broad; cone of fruit 3–3.5 cm. long, 2 cm. thick; seeds triangular, 6.5–7 mm. long.

Forests of the eastern mountains of Porto Rico. Endemic. The beautiful brown wood is hard, heavy, strong and durable, valued for furniture and in construction. SABINO. LAUREL SABINO.

2. *Magnolia portoricensis* Bello, Anales Soc. Esp. Hist. Nat. 10: 233. 1881.

A forest tree with glabrous branches. Leaves broadly oval or somewhat obovate, 7.5–15 cm. long, 5.5–10.5 cm. broad, coriaceous, abruptly short-acuminate at the apex, rounded at the base, glabrous and reticulate-veined on both surfaces; petioles 1.5–2.5 cm. long; sepals concave, greenish; petals ovate, 6 cm. long, obtuse; cone of fruit 3.5 cm. long, 2.2 cm. thick.

Forests of the western districts of Porto Rico. Endemic. JAQUILLA.

Magnolia grandiflora L., of the southeastern United States, is planted for ornament in Porto Rico; it was erroneously listed by Stahl as *Talauma Plumieri*. Its leaves are leathery, brown-hairy beneath, glabrous above, its large white flowers fragrant, the petals 7–10 cm. long, the head of fruit up to 12 cm. long.

Family 8. **ANNONACEAE** DC.

CUSTARD-APPLE FAMILY.

Trees or shrubs, often aromatic, with alternate evergreen or deciduous leaves. Inflorescence terminal, axillary or opposite the leaves. Flowers perfect or occasionally monoecious or dioecious. Calyx of 3 (rarely 2) distinct or united sepals. Corolla of 6 distinct petals, in 2 series, the three inner sometimes reduced to scales or obsolete, or petals united at the base. Stamens usually numerous. Filaments short. Anthers extrorse. Carpels few or numerous, separate or coherent, mainly fleshy in fruit. Seeds large. Embryo minute; endosperm copious wrinkled. About 46 genera and over 650 species, mostly natives of the tropics, a few in the temperate zones.

Carpels free.

Connective produced beyond the anthers into a long, tapering appendage.

Connective truncate.

Carpels united into a single fruit.

Petals distinct, concave or flat, not winged.

Petals united at the base, the outer produced into a wing.

1. *Oxandra*.

2. *Cananga*.

3. *Annona*.

4. *Rollinia*.

1. **OXANDRA** A. Rich. in Sagra, Hist. Cub. 10: 20. 1845.

Trees or shrubs, with strong, tough, fine-grained wood. Flowers solitary or clustered, axillary or lateral. Calyx 3-parted. Petals 6, imbricate, the inner slightly shorter than the outer. Stamens numerous, the connective produced above the extrorse anthers into a long tapering appendage. Receptacle convex. Carpels several, distinct. Ovule solitary, erect. Berries ellipsoid, stalked or sessile. [Greek, referring to the sharp pointed connective.] Two species,

natives of the West Indies, known as HAYA and LANCEWOOD. Type species: *Uvaria laurifolia* Sw.

Leaves elliptic-lanceolate, 3.5–9.5 cm. long; outer petals oval or obovate-oval, 4–5 mm. long; berries subsessile.
Leaves oblong-elliptic, 8–19 cm. long; outer petals oblong or oblong-elliptic, 6–7 mm. long; berries long-stalked.

1. *O. lanceolata*.
2. *O. laurifolia*.

1. **Oxandra lanceolata** (Sw.) Baill. *Adansonia* 8: 168. 1868.

Uvaria lanceolata Sw. Prodr. 87. 1788.

Uvaria virga a Sw. Fl. Ind. Occ. 999. 1800.

Guatteria virgata Dunal. Anon. 131. 1817.

Oxandra virgata A. Rich. in Sagra, Hist. Cub. 10: 20. 1845.

Bocagea virgata Benth. & Hook.; Sauv. *Anales Acad. Habana* 5: 197. 1868.

A tree, occasionally attaining a height of 15 m., with slender grayish-brown branches. Leaves lanceolate to elliptic or ovate-lanceolate, 3.5–9.5 cm. long, 1.8–4 cm. broad, usually obtusely acuminate at the apex, acute or rounded at the base, glabrous, pellucid-dotted, the petioles 1–2 mm. long; calyx-lobes semi-oval or semi-orbicular; outer petals oval or obovate-oval, 4–5 mm. long; berries ellipsoid, 11–12.5 mm. long, 7–9 mm. broad, subsessile.

Woods and thickets near Quebradillas and Cabo Rojo, Porto Rico;—Cuba; Jamaica; Hispaniola. Recorded by Bello as *Oxandra laurifolia* A. Rich. The yellow wood is light, durable and elastic, valued for rods, spars and shafts and for a variety of smaller objects.

2. **Oxandra laurifolia** (Sw.) A. Rich. in Sagra, Hist. Cub. 10: 20. 1845.

Uvaria laurifolia Sw. Fl. Ind. Occ. 1001. 1800.

Guatteria laurifolia Dunal, Anon. 132. 1817.

Bocagea laurifolia Benth. & Hook.; Sauv. *Anales Acad. Habana* 5: 197. 1868.

Xylopia acuminata DC. Prodr. 1: 93, in part. 1824. Not Dunal.

Uvaria dodecandra Sessé & Moc. Fl. Mex. ed. 2, 133. 1894.

A forest tree, sometimes 25 m. tall, with a trunk diameter of 4 dm. or more. Leaves oblong-elliptic, 8–19 cm. long, 2.5–5.5 cm. broad, acuminate at the apex, acute or somewhat rounded at the base, villous beneath when young, glabrous in age, obscurely pellucid-dotted, the petioles rather stout, 2.5–3 mm. long; calyx-lobes semi-oval, ciliate; outer petals oblong or oblong-elliptic, 6–7 mm. long; obtuse; berries ellipsoid, 15–17 mm. long, 8–10.5 mm. broad, long-stalked.

Mountain woodlands, Porto Rico; St. Croix (according to West);—Cuba; Jamaica; Hispaniola; Guadeloupe. Recorded by Bello as *Anaxagorea acuminata* St. Hil. The wood is similar to that of the preceding species.

2. **CANANGA** Aubl. Pl. Guian. 1: 607. 1775.

[GUATTERIA R. & P. (Fl. Per. Prodr. 85. hyponym, 1794) Syst. Veg. 145. 1798.]

Trees or shrubs with coriaceous or subcoriaceous leaves. Peduncles usually axillary, 1-flowered. Calyx 3-parted. Petals 6, flat, in 2-series, equal or nearly so. Stamens numerous; connective truncate. Carpels numerous, distinct. Ovules solitary in each carpel, erect. Berries ellipsoid, sessile or stalked. [Guiana name.] Some 50 species, natives of tropical and subtropical America. Type species: *Cananga Ouregou* Aubl.

Leaves 4–8 cm. long, 1.7–3 cm. broad, rounded or acute at the apex.
Leaves 8–22 cm. long, 3–7 cm. broad, long-acuminate at the apex.

1. *C. Blainii*.
2. *C. caribaea*.

1. *Cananga Blainii* (Griseb.) Britton.

Asimina Blainii Griseb. Cat. Pl. Cub. 3. 1866.

Uvaria viridiflora Sessé & Moc. Fl. Mex. ed. 2, 133. 1894. Not R. & P.

Guatteria Blainii Urban, Symb. Ant. 4: 239. 1905.

A forest tree, 10–20 m. tall. Leaves coriaceous, oblong-lanceolate to oblong-elliptic or oblong-obovate, 4–8 cm. long, 1.7–3 cm. broad, rounded or acute at the apex, acute at the base, reticulate-veined, glabrous, the petioles 3–5 mm. long; pedicels longer than the peduncles; calyx-lobes triangular or triangular-ovate, 5 mm. long; petals coriaceous, oblong-obovate or obovate, 10–14 mm. long, 5–7 mm. broad, obtuse, tomentose; berry ellipsoid, 10–13 mm. long, 6–7 mm. broad, subsessile or short-stipitate.

Forests and wooded valleys, Porto Rico:—Cuba; Hispaniola. Recorded by Bello as *Maba inconstans* Griseb. HAYA MINGA. NEGRALORA.

2. *Cananga caribaea* (Urban) Britton.

Guatteria Ouregou Griseb. Fl. Br. W. I. 7. 1859. Not Dunal, 1817.

Guatteria caribaea Urban, Symb. Ant. 4: 240. 1905.

A tree, 5–15 m. tall, the young twigs brown, appressed-puberulent. Leaves coriaceous, elliptic-oblong to elliptic-ovate, 8–22 cm. long, 3–7 cm. broad, long-acuminate at the apex, obtuse or acutish at the base, reticulate-veined, glabrous above, often somewhat pubescent beneath with scattered appressed hairs, the midvein minutely pustulate; petioles 4–7 mm. long; peduncle 3–4 mm. long, bracted, jointed with the long slender pedicel and less than half its length; calyx-lobes triangular, 3–4 mm. long, acuminate; petals coriaceous, rigid, oblong or elliptic-oblong, 10–15 mm. long, 3.5–5.5 mm. broad, obtuse, tomentose; berry oblong-cylindric, 17–20 mm. long, 6–7 mm. thick, short-stipitate.

Forests in the vicinity of Fajardo and in the Sierra de Luquillo, Porto Rico; St. Thomas (according to Grisebach):—Guadeloupe; Dominica; Martinique; Grenada. Recorded by Bello as ? *Ozandra virgata* A. Rich. HAYA BLANCA.

3. **ANNONA** L. Sp. Pl. 536. 1753.

Trees or shrubs, with coriaceous or chartaceous leaves. Flowers perfect, solitary or in clusters. Calyx 3-parted. Petals 6, in two series, valvate or slightly imbricate, the inner series sometimes reduced to small scales or even wanting. Stamens numerous, crowded on the receptacle, the fleshy filament bearing a pair of linear, parallel pollen-sacs on its back. Carpels numerous, often cohering; ovule solitary, erect. Fruit large, formed of the united carpels. [From Hanon, an aboriginal name for the tree in tropical America, probably Santo Domingo.] Fifty species or more, of tropical and subtropical distribution. Type species: *Annona muricata* L.

Flowers subglobose; petals 6, the outer broadly ovate.

Leaves with pockets in the axils of the lateral veins; inner petals imbricate; fruit armed with fleshy spinules.

Fruit with long, curved spinules, edible.

Fruit with small, straight spinules, not edible.

Leaves without pockets in the axils of the lateral veins; inner petals valvate; fruit smooth.

Flowers elongate; petals 3 only, or the 3 inner ones scale-like and inconspicuous.

Fruit composed of numerous, loosely cohering carpels which are rounded on the back; pulp custard-like.

Fruit smooth or nearly so, its surface areolate; pulp tallow-like.

1. *A. muricata*.

2. *A. montana*.

3. *A. glabra*.

4. *A. squamosa*.

5. *A. reticulata*.

1. *Annona muricata* L. Sp. Pl. 536. 1753.

Annona muricata borinquensis Morales, Fl. Arb. Cub. 60. 1887.

? *Annona portoricensis* Maza, Anal. Soc. Esp. Hist. Nat. 23: 42. 1894.

A tree, 4–10 m. high, with grayish or grayish-brown slender twigs. Leaves obovate-oblong, occasionally elliptic-oblong, 8–15 cm. long, 3.5–7 cm. broad,

usually short-acuminate at the apex, acute or somewhat rounded at the base, green and lustrous above, more or less rusty and with pockets in the axils of the lateral veins beneath, the petioles 4–14 mm. long; flowers borne on rather stout peduncles; calyx-lobes triangular, acute; petals cream-color, thick and fleshy, concave, the outer broadly ovate, valvate, 2.8–4 cm. long, 2–3 cm. broad, cordate at the base, acuminate at the apex, the inner somewhat smaller and thinner, short-clawed, imbricate; fruit ovoid, ellipsoid or somewhat heart-shaped, 15–20 cm. long, 9–12 cm. broad, the skin dark green, ill-smelling, areolate, each areole bearing a solitary fleshy curved spinule, the pulp white and juicy, pleasantly subacid; seeds brown, oblong-elliptic, 1.4–1.7 cm. long, 9–12 mm. broad.

Woods, thickets and hillsides, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix; Virgin Gorda; Tortola:—widely cultivated for its fruit in tropical regions. The fruit yields a delicious drink; the wood is soft, light, brown, not durable. GUANABANA. SOUR SOP.

2. *Annona montana* Macf. Fl. Jam. 1: 7. 1837.

A small tree, closely related to the preceding species. Leaves obovate-oblong, 7–18 cm. long, 3.7–7.5 cm. broad, often abruptly short-acuminate at the apex, acute or rounded at the base; flowers on stout peduncles; calyx-lobes triangular, acute; petals green, thick and fleshy, the outer broadly ovate, valvate, 3.5–4.7 cm. long, 2.7–3.2 cm. broad, cordate; inner petals broadly obovate or elliptic, imbricate, 2.5–3 cm. long, 2–2.4 cm. broad, usually rounded at the apex, narrowed at the base into a claw; fruit broadly ovoid or subglobose, 6–10 cm. in diameter, occasionally larger, the skin dark green, areolate, bearing small fleshy straight spinules, the pulp yellowish when ripe, not edible; seeds light brown or tan-colored, 2–2.3 cm. long, 1–1.2 cm. broad.

Mountain woodlands and shaded ravines, Porto Rico; St. Croix:—Cuba and Jamaica to Trinidad; Central and South America. GUANABANA CIMMARONA. MOUNTAIN OF WILD SOUR SOP.

3. *Annona glabra* L. Sp. Pl. 537. 1753.

Annona palustris L. Sp. Pl. ed. 2, 757. 1762.

Annona laurifolia Dunal, Anon. 65. 1817.

A tree, 5–10 m. high, or occasionally up to 14 m. with a trunk diameter of 2–4 dm., the bark reddish-brown. Leaves oblong-elliptic to ovate, 6–18 cm. long, acute or short-acuminate, usually rounded at the base, the petioles 0.7–2.5 cm. long; flowers nodding on rather stout peduncles; calyx-lobes triangular, 8–11 mm. broad, acute; petals valvate, thick and fleshy, concave, the outer broadly ovate, 2.2–3.4 cm. long, cream-colored or greenish-yellow, sometimes deep red at the base within, the inner ovate, 0.8–2.5 cm. long, dirty white on the back, the inner surface blood red at the base; fruit ovoid, 6–12 cm. long, 5–8 cm. thick, smooth, faintly areolate, rounded at the top, impressed at the base, yellow with brown blotches when fully ripe, the pulp slightly aromatic, insipid; seeds brown, about 1.5 cm. long.

Coastal swamps, borders of marshes and banks of streams, Porto Rico, at low elevations; Vieques; St. Thomas; St. Jan; St. Croix; Virgin Gorda; Tortola:—Florida; West Indies; Panama; South America; west coast of Africa; Galapagos Islands. The brownish wood is soft, weak and not durable; it is very light in weight, the specific gravity only about 0.5; it is used for floats, rafts and stoppers. CAYUR. CORAZON CIMARRON. COIK WOOD. ALLIGATOR APPLE. POND APPLE. MONKEY APPLE. MANGROVE ANNONA. BUNYA. DOG APPLE.

4. *Annona squamosa* L. Sp. Pl. 537. 1753.

Annona cinerea Dunal, Anon. 71. 1817.

A rather small tree, occasionally 10 m. high, the young twigs densely pubescent. Leaves elliptic-lanceolate to oblong, 6–12 cm. long, 3–4.5 cm. broad, sometimes larger, pubescent, at least when young, sometimes glabrous when old, acute or short-acuminate at the apex, narrowed or occasionally rounded at the

base, minutely punctate, the petioles 5–12 mm. long; flowers several in a cluster, or occasionally solitary; calyx-lobes triangular, acute, pubescent, 1.5 mm. long; outer petals linear-oblong, 1.6–2.5 cm. long, 5–7 mm. wide, pubescent-keeled on the inside and with a purple excavation at the base; inner petals minute, ovate or obovate; fruit subglobose or ovoid, 5–9 cm. in diameter, composed of numerous loosely cohering carpels which are rounded on the back, greenish-yellow when ripe and covered with a glaucous bloom, the sweet pulp white; seeds oblong or oblong-elliptic, 1–1.5 cm. long, 6.5–9 mm. broad.

Thickets, roadsides and valleys, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix; Virgin Gorda; Tortola.—West Indies; widely cultivated for its fruit in all tropical regions. The wood is brownish, weak, soft and light. ANON. SWEET SOP. SUGAR APPLE.

5. ***Annona reticulata*** L. Sp. Pl. 537. 1753.

Annona longifolia Sessé & Moc. Fl. Mex. ed. 2, 134. 1894. Not Aubl. 1775.

A small tree, sometimes 8 or 9 m. tall, the grayish bark shallowly grooved, the young twigs fulvous-pubescent. Leaves oblong to lanceolate, 9–21 cm. long, acute or acuminate at the apex, acute or rounded at the base, puberulent when young, glabrous when old, the petioles 6–18 mm. long; flowers several in a cluster; peduncles nodding; calyx-lobes triangular, acute; outer petals fleshy, oblong, 2–3 cm. long, 4–6.5 mm. broad, olive-green or yellowish, keeled on the inside and usually purplish, with a dark purple blotch at the base; inner petals minute, ovate; fruit subglobose, 8–12 cm. in diameter, smooth, reticulate-areolate, usually reddish-brown when ripe, the pulp yellowish; seeds oblong, brown, shining.

Roadsides, woods, hillsides and pasture lands, Porto Rico; Vieques; St. Thomas; St. Jan; St. Croix.—West Indies; widely cultivated for its fruit in tropical regions. The brownish wood is light and weak. CORAZON. CUSTARD APPLE. BULLOCK'S HEART.

Annona involucrata Baill. *Adansonia* 8: 265. 1868.

Annona Prestoei Hemsl. in Hook. Ic. Pl. 26: pl. 2519, 2520. 1897.

The Porto Rican record for this species, a native of the mountains of Mexico, Guatemala, Salvador, Trinidad and possibly Venezuela, is based wholly on a drawing of a tree in western Porto Rico. It is probable that the illustration was made from a cultivated plant.

Annona diversifolia Safford, Guatemalan, sent to the St. Croix Agricultural Experiment Station from Washington in 1922, was growing well there in 1923.

Annona cherimolia Mill., CHERIMOYA, native of the South American Andes, occasionally planted for its fruit in West Indian gardens and naturalized in Jamaica, was recorded by Krebs as found in St. Thomas.

4. **ROLLINIA** St. Hil. Fl. Bras. Merid. 1: 28. 1825.

Trees or shrubs, the leaves and fruits resembling those of species of *Annona*. Flowers perfect. Calyx 3-parted. Petals united at the base, the three outer produced into wings or spurs, in some species horizontal, in others curved upward and inward, or outward and downward, the three inner reduced to scales, alternating with the outer, or obsolete. Stamens numerous, crowded on the receptacle. Carpels numerous, cohering; ovule solitary, erect. Fruit often large. [Named in honor of Charles Rollin, a French historian.] About 35 species, natives of tropical America. Type species. *Rollinia longifolia* St. Hil.

1. **Rollinia mucosa** (Jacq.) Baill. *Adansonia* 8: 268. 1868.

Annona mucosa Jacq. Obs. 1: 16. 1764.

Rollinia Sieberi A. DC. Mem. Soc. Phys. Hist. Nat. Geneve 5: 199. 1832.

Annona biflora Sessé & Moc. Fl. Mex. ed. 2, 133. 1894.

A small tree, with slender brown pubescent twigs. Leaves oblong-elliptic to elliptic, 10–21 cm. long, acuminate at the apex, acute or rounded at the base, pubescent above and pilose beneath when young, in age glabrate above, pilose beneath with appressed rufous hairs; petioles 6–11 mm. long; peduncle often opposite a leaf, 1-flowered, 1.5–4 cm. long, pubescent with appressed hairs and bearing 2 ovate bracteoles, one below the middle, the other at the base; calyx-lobes triangular, acute or acuminate; corolla densely fulvous-tomentose, the outer petals obovate, 1.5–2.2 cm. long, 6–12 mm. broad; fruit subglobose, 7 cm. or more in diameter, areolate, each areole produced into a thick angled spinule; pulp white, mucilaginous, sweet, edible; seeds brown, obovate, 15–20 mm. long, 10–13 mm. broad.

Forests near Adjuntas and Quebradillas:—Hispaniola; Guadeloupe; Martinique; St. Vincent; Trinidad; Mexico. Recorded by Bello as *Anona dolabripetala* DC. The yellowish wood is hard, strong and heavy.

Rollinia multiflora Splitg., a Guiana species, was erroneously recorded as Porto Rican by Grosourdy and by Cook and Collins.

Rollinia longiflora A. St. Hil., a Brazilian species, was erroneously recorded as Porto Rican by Cook and Collins.

Canangium odoratum (Lam.) King, YLANG-YLANG, East Indian, is commonly planted in Porto Rico and occasionally in the Virgin Islands. It is a tall, rather quick-growing tree, up to 15 m. high, the bark russet, with sweet scented flowers. [*Uvaria odorata* Lam.; *Cananga odorata* Hook. f. & Thoms.]

Family 9. **HERNANDIACEAE** Dumort.

HERNANDIA FAMILY.

Shrubs or forest trees, the alternate leaves 3–7-nerved a little above the base, pinnately nerved above. Inflorescence long-stalked, terminal or in the axils of the upper leaves, corymbose or paucied. Perianth-segments usually in 3–5-parted whorls. Stamens opposite the outer segments. Anthers 2-celled. Staminodes more or less glandular, or wanting. Ovary inferior, 1-celled; ovule solitary, pendulous. Fruit dry. Seed without endosperm. Embryo straight. Cotyledons large, sometimes lobed. About 4 genera and 35 species, natives of the tropics.

1. **HERNANDIA** [Plum.] L. Sp. Pl. 981. 1753.

Evergreen trees with long-petioled entire, often peltate leaves. Flowers monoecious, small, in loose corymb-like cymes, the branches terminated by usually 3-flowered cymules each surrounded by an involucre of 4 or 5 bracts, the central flower pistillate, sessile, the lateral ones staminate and stalked. Pistillate flower surrounded at the base by a cup-like involucre; perianth-segments 8 or 10; staminodes 4 or 5; ovary inferior, 1-ovuled; style short; stigma dilated. Staminate flowers with 6 or 8 perianth-segments; stamens 3 or 4; staminodes twice as many as the stamens and attached one on each side at the base of each filament, or as many and alternate, or wanting. Fruit inclosed in the much enlarged involucre. Seed subglobose or ovoid; testa thick, hard, ridged. Cotyledons lobed.

{In honor of Francisco Hernandez, 1530-1578, physician to Philip II of Spain; traveled in the West Indies and Mexico.] About 14 species of wide geographic distribution in the tropics. Type species: *Hernandia sonora* L.

1. **Hernandia sonora** L. Sp. Pl. 981. 1753.

A tree, 10-25 m. tall. Leaves oblong-ovate to oval-ovate, 12-25 cm. long, 7-16 cm. broad, occasionally larger, usually peltate, or cordate at the base, acute to acuminate at the apex; inflorescence 12-20 cm. long, the branches grayish-tomentulose; involucre bracts oblong, 5-7 mm. long, 2.5-3.8 mm. broad, tomentulose; flowers yellowish, the perianth-segments 5-7 mm. long, 1.5-2.8 mm. broad, tomentulose; fruit ovoid or ellipsoid, 2.5-3.3 cm. long, 1.8-2.7 cm. in diameter.

Forests in wet or dry districts, Porto Rico.—Cuba; Montserrat to Trinidad; continental tropical America. Recorded by Sessé & Moçino as *Hernandia pellata*. The nearly white wood is light and soft. MAGO.

Family 10. **LAURACEAE** Lindl.

LAUREL FAMILY.

Aromatic trees or shrubs, with alternate or opposite leaves, the blades thick, entire or lobed, often minutely pellucid dotted. Flowers small, perfect, polygamous, dioecious or monoecious, yellow, white or greenish, in panicles, corymbs, racemes or umbels. Calyx 4-6-lobed or -parted, the segments imbricated in 2 series in the bud. Corolla none. Androecium of usually more stamens than there are calyx-lobes, in 2-4 series, those of the third series often glandular-appendaged, those of the fourth series mostly mere staminodia. Filaments free or united into a staminal tube. Anthers opening by valves. Ovary superior, free from the calyx, 1-celled; ovule solitary, anatropous, pendulous; stigma discoid or capitate. Fruit a 1-seeded drupe or berry. Endosperm none. Cotyledons plano-convex, acuminate. About 40 genera and 1000 species, widely distributed in tropical regions; a few in temperate zones. Most of the native Porto Rico species are evergreen and known as LAUREL.

Anthers 2-celled.

Fertile stamens usually 9.

Calyx deciduous, the fruit without a cupule; staminodes large, cordate-sagittate.

Calyx persistent, the fruit immersed in a toothed cupule; staminodia small.

Fertile stamens 3.

Stamens free, the two outer series usually changed to foliaceous staminodia.

Stamens united into a tube, the two outer series abortive.

Anthers of the outer series 4-celled.

Staminodes large, sagittate.

Lower cells of the anthers touching the upper at the side.

Lower cells of the anthers touching the upper at their base.

Staminodes none or small, sometimes club-shaped.

Anther-cells superposed in pairs.

Anther-cells of the outer ring arranged in a bow-shaped curve.

1. *Hufelandia*.

2. *Aniba*.

3. *Acrodiclidium*.

4. *Misanteca*.

5. *Persea*.

6. *Phoebe*.

7. *Ocotea*.

8. *Nectandra*.

1. **HUFELANDIA** Nees, Pl. Laur. Expos. 11. 1833.

Trees with alternate leaves, the blades coriaceous, often glaucous beneath. Inflorescence axillary or subterminal. Flowers perfect. Calyx 6-parted, deciduous in fruit, its segments nearly equal. Fertile stamens 9, the filaments as long as or shorter than the 2-celled anthers. Staminodes large, cordate-sagittate, sessile or stipitate. Ovary subglobose or ovoid, glabrous, the stigma subcapitate.

Drupe ellipsoid, succulent, without a cupule. [Dedicated to C. W. Hufeland, a doctor of medicine.] About 8 species, natives of tropical America. Type species: *Laurus pendula* Sw.

1. **Hufelandia pendula** (Sw.) Nees, Pl. Laur. Expos. 22. 1833.

Laurus pendula Sw. Prodr. 65. 1788.

Hufelandia thomaea Nees, Pl. Laur. Expos. 23. 1833.

Beilschmiedia thomaea Maza, Anal. Inst. Seg. Ens. 2: 207. 1895.

Wimmeria thomaea Nees; Meissn. in DC. Prodr. 15¹: 65, as synonym. 1864.

A forest tree, sometimes 20 m. high, the bark nearly smooth, the twigs minutely and often densely strigillose with short light brown hairs. Leaf-blades elliptic or elliptic-obovate, 4.5–15 cm. long, 2–7 cm. broad, usually obtusely short-acuminate at the apex, cuneate at the base, glaucous and sparingly pubescent beneath when young, finely reticulate-veined on both surfaces; panicles lax; calyx greenish-yellow, its lobes elliptic to oval, 1–1.7 mm. long, 1–1.2 mm. broad, fruit ellipsoid, 2.7–4 cm. long, 1.3–1.5 cm. thick, black.

Mountain forests, Porto Rico; St. Thomas;—Cuba; Jamaica; Hispaniola; St. Kitts to St. Lucia. The brownish wood is hard, strong and tough. AGUACATE CIMARRON. CEDRO MACHO. PALO COLORADO.

2. **ANIBA** Aubl. Pl. Guian. 1: 327. 1775.

Trees with alternate or sometimes subverticillate leaves, the blades chartaceous or leathery. Flowers perfect in axillary panicles. Calyx 6-parted, its lobes nearly equal. Fertile stamens usually 9, with 3 inner abortive or changed into staminodia, the anthers 2-celled. Ovary pilose or glabrous. Berry ellipsoid or subglobose, the cupule usually simple-margined, truncate or toothed. [Name unexplained.] About 28 species, natives of tropical America. Type species: *Aniba guianensis* Aubl.

1. **Aniba bracteata** (Nees) Mez, Jahrb. Bot. Gart. Berlin 5: 66. 1889.

Aydendron bracteatum Nees, Syst. 256. 1836.

Aydendron argenteum Griseb. Fl. Br. W. I. 285. 1860.

A small or medium size tree, the twigs rather stout, ferruginous-tomentose. Leaves often subverticillate, coriaceous, oblanceolate, obovate or elliptic, 1.5–3.5 dm. long, 3.5–9.5 cm. broad, acute to long-acuminate at the apex, obtuse or acute at the base, short-petioled, glabrous, the midrib and primary veins flat or impressed above, prominent beneath; inflorescence many-flowered, the branches tomentulose; calyx densely pubescent with mostly appressed hairs, its lobes ovate, about 1 mm. long; drupe ellipsoid, 2 cm. long, 11 mm. broad, the cupule irregularly toothed.

Mountain forests, Porto Rico;—Montserrat; Guadeloupe; Dominica; Martinique; St. Lucia; St. Vincent. CANELILLO.

3. **ACRODICLIDIUM** Nees, Pl. Laur. Expos. 13. 1833.

Trees or shrubs with alternate or rarely opposite leaves, the blades coriaceous or chartaceous, pinnately veined. Inflorescence axillary or subterminal. Flowers perfect. Calyx 6-parted, its lobes equal or nearly so, deciduous. Fertile stamens 3, in a single series with an inner series of abortive ones and usually 2 outer series of foliaceous staminodia; filaments of the fertile stamens with two glands at the base, the staminodia without glands; anthers 2-celled, extrorse or rarely introrse. Berry ellipsoid, the cupule simple or double-margined. [Greek, referring to the

two apical lids by which the anthers open.] About 20 species, natives mostly of South America. Type species: *Acrodictidium brasiliense* Nees.

1. **Acrodictidium salicifolium** (Sw.) Griseb. Fl. Br. W. I. 280. 1860.

Laurus salicifolia Sw. Fl. 2: 709. 1800.

A tree, 7–15 m. tall, the bark dark gray, nearly smooth, the twigs slender, ferruginous-tomentulose. Leaf-blades coriaceous, oblong-lanceolate or lanceolate, 3.5–15 cm. long, 1–4.5 cm. broad, acute to long-acuminate at the apex dark green, glabrous or slightly pubescent and reticulate-veined above, paler, often pubescent and reticulate-veined beneath, the petioles 5–10 mm. long; branches of the inflorescence tomentulose; calyx strigose-puberulent, its lobes ovate to ovate-oval, 1–1.3 mm. long, 0.8–1 mm. broad; drupe ellipsoid, 12–15 mm. long, 6–8 mm. in diameter, the cupule double-margined.

Hillsides and woodlands at lower and middle elevations, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan.—Antigua; Montserrat; Guadeloupe; Martinique. CANELA. CANELLILLO.

4. **MISANTECA** Cham. & Schl. Linnaea 6: 367. 1831.

Evergreen trees or shrubs with alternate leaves, the blades leathery, entire. Flowers perfect, small, in paniced cymes. Calyx lobes 6, nearly equal, deciduous in fruit. Stamens 3, united into a tube, the anthers 2-celled, opening outward. Style columnar; stigma minute. Berry ellipsoid or ovoid, seated in a double-margined cupule. [Name derived from "palo misanteco," the Mexican name.] About 4 species, natives of tropical America. Type species: *Misanteca capitata* Cham. & Schl.

1. **Misanteca triandra** (Sw.) Mez, Jahrb. Bot. Gart. Berlin 5: 103. 1889.

Laurus triandra Sw. Prodr. 65. 1788.

Acrodictidium jamaicense Nees, Syst. Laur. 270. 1836.

A tree, 10–20 m. high, with a somewhat flaky bark. Leaf-blades oblong-elliptic, elliptic or oval, 5–13 cm. long, 1.8–5.5 cm. broad, often abruptly acuminate at the apex, the tip often obtuse, acute or occasionally rounded at the base, lustrous above, glabrous; perianth 0.8–1.8 mm. wide, the lobes obtuse; drupes oblong-ovoid or ovoid, 2–2.5 cm. long, 1.2–1.4 cm. in diameter, green, the enlarged cup-like perianth red.

Woods, near Bayamon and Quebradillas; Vieques.—Florida; Cuba; Jamaica; Hispaniola; Martinique.

5. **PERSEA** Mill. Gard. Dict. Abr. ed. 4. 1754.

Trees or shrubs, with alternate coriaceous persistent entire leaves. Flowers small. Calyx deeply 6-parted. Stamens usually 12, in 4 series of 3, the inner series reduced to gland-like staminodia, the 3 other series anther-bearing, their anthers usually 4-celled, 4-valved. Staminodia large, cordate, stalked. Berry ellipsoid, globose or pear-shaped. [Ancient Greek name of some oriental tree.] About 60 species, natives mostly of America. Type species: *Laurus Persea* L.

Ovary pilose; leaf-blades 3–16 cm. broad, often sparingly puberulent on the veins beneath.

Ovary glabrous; leaf-blades 1.5–3.2 cm. broad, densely pubescent with short, brown or grayish-brown, appressed hairs beneath.

1. *P. Persea*.

2. *P. Krugii*.

1. **Persea Persea** (L.) Cockerell, Bull. Torrey Club 19: 95. 1892.*Laurus Persea* L. Sp. Pl. 370. 1753.*Persea gratissima* Gaertn. f. Fr. & Sem. 3: 222. 1807.*Persea americana* Mill. Gard. Dict. ed. 8. 1768.

A tree, sometimes 18 m. high, with a trunk 6 dm. diameter, usually smaller. Leaf-blades oblong to elliptic or oval, or slightly broadest above or below the middle, 7–25 cm. long, 3–16 cm. broad, acute, short-acuminate or rounded at the apex, acute, rounded or somewhat truncate at the base, glabrous above, usually somewhat glaucous and often sparingly puberulent on the veins beneath, the nerves prominent; petioles 1.5–5 cm. long, channeled above, often puberulent; flowers tomentulose; calyx greenish, its lobes somewhat unequal, oblong-lanceolate or oblong elliptic, 4.5–6 mm. long, ovary pilose; drupe pyriform, subglobose, oval or ovate, 8–20 cm. long, the flesh butter-like.

Spontaneous after planting, Porto Rico; St. Thomas; St. Croix.—Native of Mexico. Widely cultivated in many races in tropical and subtropical regions for its edible fruit, which yields a valuable oil, used for burning and for making soap. The wood is reddish-brown and soft, its specific gravity about 0.6. AGUACATE. AVGADO PEAR. ALLIGATOR PEAR.

2. **Persea Krugii** Mez, Jahrb. Bot. Gart. Berlin 5: 177. 1889.

A tree, sometimes 15 m. high, the young twigs, branches of the inflorescence, pedicels, calyx, and under surface of the leaves clothed with a brown silky appressed pubescence. Leaf-blades oblong-lanceolate to elliptic, 4–10 cm. long, 1.4–3.2 cm. broad, acute, short-acuminate, or obtuse at the apex, acute at the base, pubescent above when young, the hairs sometimes persistent in age; petioles 6–18 mm. long, channeled above, pubescent; pedicels 2–3 mm. long, inflorescence equalling or shorter than the leaves; calyx yellowish, its lobes unequal, ovate to oval-ovate, acute, the outer 2.4–3 mm. long, 1.5 mm. broad, the inner 4.5–5 mm. long; filaments pilose; ovary glabrous, the style slender; drupe not seen.

Mountain forests, western districts of Porto Rico.—Hispaniola. CANELA.

6. **PHOEBE** Nees, Syst. Laur. 98. 1836.

Trees or shrubs, with alternate leaves, the blades chartaceous or coriaceous, pinnately veined or triple-nerved. Inflorescence axillary. Calyx 6-parted, wholly persistent in fruit. Fertile stamens 9; anthers of the outer ring 4-celled, those of the inner ring usually 4-celled and opening outwards or laterally; staminodes cordate-sagittate. Berry ellipsoid; pedicels often somewhat thickened in fruit. [Greek, one of the names of the moon goddess.] About 82 species, mostly natives of tropical America, a few in the East Indies and the Malay Archipelago; the Porto Rico species are called AVESPILLO. Type species: *Ocotea sericea* Nees.

Leaves triple-nerved,
Leaves pinnately veined.

1. *P. montana*.
2. *P. elongata*.

1. **Phoebe montana** (Sw.) Griseb. Fl. Br. W. I. 279. 1860.*Laurus montana* Sw. Prodr. 65. 1788.

A tree, up to 20 m. high, the young twigs ferruginous-tomentose. Leaf-blades elliptic-lanceolate to ovate or oval, triple-nerved, 4–11 cm. long, 2–6.5 cm. broad, acuminate at the apex, acute or rounded at the base, glabrous or pubescent on the midvein above, pubescent on the veins beneath; branches of the inflorescence pilose; flowering pedicels 1–2.5 mm. long; calyx pilose, its lobes elliptic, 0.8–2 mm. long, about 1 mm. broad; staminodes cordate-sagittate; ovary glabrous; drupe subelliptic, 9–10 mm. long, 6–7 mm. broad.

Mountain forests, central and western districts of Porto Rico.—Cuba; Jamaica; Hispaniola.

2. *Phoebe elongata* (Vahl) Nees, Syst. Laur. 116. 1836.*Laurus elongata* Vahl; Nees, Syst. Laur. 116. 1836.*Phoebe cubensis* Nees, Syst. Laur. 120. 1836.*Phoebe antillana genuina* Meissn. in DC. Prodr. 15¹: 31. 1864.*Phoebe antillana portoricensis* and *cubensis* Meissn. in DC. Prodr. 15¹: 31. 1864.

A tree, 6–12 m. tall, occasionally up to 20 m., the bark smooth and gray, the young twigs glabrous or tomentulose. Leaf-blades elliptic-lanceolate to ovate or elliptic, pinnately veined, 5–19 cm. long, 2–6 cm. broad, acuminate at the apex, acute or rounded at the base, glabrous above in age, sparingly short-pilose on the veins beneath; branches of the inflorescence glabrous or sparsely pilose; flowering pedicels 1.5–3 mm. long; calyx greenish-white or white, its lobes ovate or elliptic-ovate, about 2 mm. long, 1.5 mm. broad, pilose within; staminodes sagittate, triangular-acute; ovary glabrous; drupe ellipsoid, 13–15 mm. long, 6–7 mm. in diameter.

Woods and forests in wet or moist districts, Porto Rico; St. Croix:—Cuba; Hispaniola; Montserrat to Trinidad.

7. *OCOTEA* Aubl. Pl. Guian. 2: 780. 1775.

Evergreen trees, rarely shrubs, with alternate coriaceous leaves and small perfect or polygamous flowers in axillary or terminal panicles. Calyx 6-parted, its lobes nearly equal, deciduous or persistent. Perfect stamens 9, in 3 series; stamens of the first and second series eglandular, their anthers introrsely 4-celled; stamens of the 3rd series with extrorsely 4-celled anthers; staminodia, representing a fourth series of stamens, are present in some species. Ovary wholly or partly enclosed by the perianth-tube; style short. Berry oblong to globose, partly enclosed by the enlarged perianth-tube. [Guiana name.] About 200 species of wide geographic distribution, most abundant in the American tropics. Type species: *Ocotea guianensis* Aubl.

Flowers perfect; filaments often pilose.

Leaf-blades densely ferruginous pubescent beneath when young, the hairs sometimes becoming grayish in age.

Leaf-blades oblong-lanceolate or lanceolate, acute or acuminate at the apex.

Leaf-blades obovate, rounded, truncate or abruptly short-acute at the apex.

Leaves glabrous.

Filaments nearly equalling the anthers, or longer.

Drupe 2.3–3.2 cm. long, 18–25 mm. in diameter; cupule saucer-shaped; leaves clustered mostly at or near the apex of the branches.

Drupe 11–12 mm. long, 12 mm. in diameter; cupule hemispheric; leaves scattered.

Filaments less than one half as long as the anthers; cupule saucer-shaped.

Flowers dioecious; filaments glabrous.

Leaf-blades with callus-like thickenings in the axils of the veins beneath.

Leaf-blades without callus-like thickenings in the axils of the veins.

Cupule simple-margined; nerves of the upper leaf-surface inconspicuous.

Cupule double-margined; nerves of the upper leaf-surface usually reticulate.

1. *O. Wrightii*.2. *O. cuneata*.3. *O. spathulata*.4. *O. moschata*.5. *O. foeniculacea*.6. *O. portoricensis*.7. *O. leucozydon*.8. *O. floribunda*.1. *Ocotea Wrightii* (Meissn.) Mez, Jahrb. Bot. Gart. Berlin 5: 267. 1889.*Acrodielidium Wrightii* Meissn. in DC. Prodr. 15¹: 85. 1864.

A tree, 10–30 m. high, the branches appressed-puberulent. Leaf-blades coriaceous, oblong-lanceolate to lanceolate, 6–12 cm. long, 1.5–3 cm. broad,

acuminate at the apex, acute at the base, glabrous above, densely ferruginous-pubescent beneath with appressed hairs when young; petioles 5-7 mm. long; inflorescence shorter than the leaves, its branches pubescent; flowers perfect; calyx pubescent, its lobes ovate, obtuse; filaments somewhat pilose, the anthers oval; ovary glabrous; drupe globose, 10 mm. in diameter, the cupule hemispheric, double-margined.

Mountain forests, western districts of Porto Rico.—Cuba. CANELA. CANELON

2. *Ocotea cuneata* (Griseb.) Urban, Symb. Ant. 4: 246. 1905.

Nectandra cuneata Griseb. Mem. Amer. Acad. II. 8: 188. 1860.

Nemodaphne cuneata Meissn. in DC. Prodr. 15¹: 109. 1864.

Ocotea nemodaphne Mez, Jahrb. Bot. Gart. Berlin 5: 270. 1889.

A small or medium size tree, the young twigs, branches of the inflorescence, petioles and under surface of the young leaves clothed with a dense ferruginous velvety pubescence, which in age becomes grayish. Leaf-blades coriaceous, obovate, 6-14 cm. long, 2.5-7.5 cm. broad, rounded, truncate or occasionally abruptly short-acute at the apex, cuneate at the base; petioles rather stout, 5-10 mm. long; inflorescence sometimes equalling or longer than the leaves; flowers perfect; calyx densely rusty tomentose, its lobes elliptic to oval or ovate, 2.5 mm. long; filaments pilose, the anthers ovate, obtuse; ovary glabrous; drupe ellipsoid, about 16 mm. long, 12-13 mm. in diameter, the cupule hemispheric, sometimes double-margined.

Mountain forests, western districts of Porto Rico.—Cuba. SASSAFRAS. LAUREL SASSAFRAS. Not to be confused with the northern genus *Sassafras*.

3. *Ocotea spathulata* Mez, Jahrb. Bot. Gart. Berlin 5: 268. 1889.

A tree, sometimes up to 20 m. high, the leaves clustered mostly at or near the ends of the twigs. Leaf-blades rigid-coriaceous, spatulate-obovate or obovate, 7-12 cm. long, 2.4-6 cm. broad, obtuse or rounded at the apex, acute at the base, glabrous and rather dull above, lustrous, rather faintly reticulate-veined and glabrous beneath, short-petioled; inflorescence ferruginous-hirsute, shorter than the leaves; flowers perfect; calyx pilose; filaments nearly glabrous, the anthers ovate; ovary glabrous; drupe ellipsoid or subglobose, 2.3-3.2 cm. long, 18-25 mm. broad, the cupule sometimes double-margined.

Forests of the eastern mountains of Porto Rico.—Cuba. GRANADILLO. NEMOCA CIMARRON.

4. *Ocotea moschata* (Pavon) Mez, Jahrb. Bot. Gart. Berlin 5: 269. 1889.

N'espilodaphne moschata Meissn. in DC. Prodr. 15¹: 106. 1864.

Laurus moschata Pavon; Meissn. in DC. Prodr. 15¹: 106, as synonym. 1864.

A tree, 10-20 m. high, the young twigs and branches of the inflorescence clothed with a ferruginous tomentum. Leaf-blades coriaceous, narrowly to broadly obovate or occasionally elliptic, 6-14 cm. long, 2.2-7 cm. broad, obtuse or rounded at the apex, cuneate at the base, glabrous above, the midrib and veins slightly impressed, glabrous or slightly puberulent beneath with appressed hairs, the midrib and primary veins rather prominent; petioles stout, short; inflorescence shorter than the leaves; flowers perfect, short-pedicelled; calyx ferruginous-tomentulose, its lobes elliptic, 3-3.5 mm. long, 2.3-2.5 mm. broad; filaments pilose, the anthers elliptic, obtuse; ovary glabrous; drupe subglobose or ovoid, 11-12 mm. long, 12 mm. in diameter, cupule hemispheric, double-margined.

Mountain forests of Porto Rico. Endemic. NEMOCA. NUEZ MOSCODA. NUEZ MOSCODA CIMARRONA. NUEZ MOSCODA DEL PAYS.

5. *Ocotea foeniculacea* Mez, Jahrb. Bot. Gart. Berlin 5: 266. 1889.

A tree, up to 25 m. tall, the young branches pubescent. Leaf-blades rigid-coriaceous, elliptic or obovate-elliptic, 5-8.5 cm. long, 2.3-4 cm. broad acute at

the apex, cuneate at the base, glabrous, shining and reticulate-veined beneath; inflorescence subracemose, shorter than the leaves, pubescent; flowers perfect; calyx white, strigose-pubescent, its lobes ovate, acute; filaments pilose; ovary subglobose, glabrous; drupe ellipsoid, 20 mm. long, 12 mm. in diameter, black; cupule obscurely double-margined.

Forests, vicinity of Adjuntas, Porto Rico.—Cuba. PALO SANTO.

6. *Ocotea portoricensis* Mez, Jahrb. Bot. Gart. Berlin 5: 364. 1889.

A tree, 7–15 m. high, with slender branches, the young twigs minutely strigose. Leaf-blades subcoriaceous, elliptic-lanceolate or elliptic, 5.5–10 mm. long, 1.5–3.5 cm. broad, glabrous above, the primary veins slender, slightly elevated, glabrous beneath with callus-like thickenings in the axils of veins; petioles slender, 5–10 mm. long; inflorescence shorter than the leaves, few-flowered; flowers dioecious; calyx minutely strigose, its lobes ovate to broadly ovate, 1.5–2 mm. long, 1.3–1.5 mm. broad, pubescent within; anthers elliptic-ovate; ovary glabrous; drupe cylindrical-ellipsoid, 1.6–1.8 cm. long, 4.5 mm. in diameter (mature?); cupule small, narrowly funnel-shaped, 3–4 mm. wide.

Mountain forests of Porto Rico. Endemic.

7. *Ocotea leucoxylo* (Sw.) Mez, Jahrb. Bot. Gart. Berlin 5: 329. 1889.

Laurus leucoxylo Sw. Prodr. 65. 1788.

Laurus exaltata lancifolia Poir. in Lam. Encycl. Suppl. 3: 319. 1813.

Persea leucoxylo Spreng. Syst. 2: 268. 1825.

Oreodaphne leucoxylo Nees, Syst. Laur. 413. 1836.

A tree, up to 24 m. high, the young twigs and branches of the inflorescence often minutely and densely strigillose-puberulent. Leaf-blades coriaceous, oblong-lanceolate to elliptic or elliptic-ovate, 10–27 cm. long, acute, acuminate or obtuse at the apex, rounded or acute at the base, glabrous above, the midrib and primary veins more or less impressed, glabrous or puberulent on the midrib beneath, the primary veins prominent; flowers dioecious; staminate flowers with elliptic-oblong calyx-lobes 1.8–2 mm. long; anthers suberect, the ovary sterile; pistillate flowers with minute sterile stamens; drupe subglobose, 8 or 9 mm. in diameter, the cupule greenish-brown, usually covered with light brown warts.

Hillside thickets and forests in wet or moist districts, Porto Rico, ascending to higher elevations; St. Thomas; Tortola.—Cuba; Jamaica; Hispaniola; Guadeloupe to Grenada. CACAILLO.

8. *Ocotea floribunda* (Sw.) Mez, Jahrb. Bot. Gart. Berlin 5: 325. 1889.

Laurus floribunda Sw. Prodr. 65. 1788.

Laurus cerifera Vahl, Skrivt. Nat. Selsk. Kopenh. 6: 130. 1810.

Strychnodaphne floribunda Griseb. Fl. Br. W. I. 283. 1860.

A tree, 9–20 m. high, the young twigs, branches of the inflorescence and petioles sparsely pubescent. Leaf-blades elliptic-lanceolate to elliptic or somewhat obovate, 5–18 cm. long, obtuse or acuminate at the apex, the tip usually rounded, acute at the base, glabrous and often finely reticulate-veined above, glabrous or somewhat puberulent and reticulate-veined beneath; flowers dioecious; calyx sparingly puberulent; staminate flowers with elliptic, broadly elliptic or ovate calyx-lobes 2–2.5 mm. long, the ovary sterile; pistillate flowers with the stamens well developed, the anthers without valves; drupe subglobose or ellipsoid, 1–1.3 cm. long, the cupule flat, double-margined, the calyx-lobes reflexed and often persistent in fruit.

Woods and forests at lower and middle elevations in moist or wet districts, Porto Rico; St. Jan; Tortola.—Cuba; Jamaica; Hispaniola; Guadeloupe; Martinique; Trinidad; also in Central and South America.

8. **NECTANDRA** Roland; Rottb. Act. Lit. Univ. Hafn. 1: 279. 1778.

Trees or shrubs with alternate leaves and small perfect or polygamous flowers in axillary or terminal panicles. Calyx 6-parted, its lobes nearly equal. Stamens 9, much shorter than the perianth. Anthers 4-celled; staminodes none or small; filaments short or globose, seated in a simple-margined, cup-shaped, or saucer-shaped cupule; pedicel often thickened or expanding above to the diameter of the cupule. [Greek, honey-stamens.] Over 80 species of tropical America. Type species: *Nectandra sanguinea* Rottb.

Anthers sessile, or filaments glabrous.

Calyx 5.5 mm. or more wide; anthers sessile.

Drupe ellipsoid, 1.2-1.8 cm. long, 6-10 mm. in diameter.

Twigs, branches of the inflorescence, pedicels and calyx clothed with a loose ferruginous tomentum.

Twigs, branches of the inflorescence, pedicels and calyx glabrous or pubescent with short appressed hairs.

Drupe globose, 8-10 mm. in diameter.

Calyx 3.5-4.5 mm. in diameter; filaments glabrous.

Filaments pilose; leaves reticulate-veined on both surfaces.

Calyx 4-5 mm. wide; drupe oblong-ellipsoid or somewhat ovoid, 2-2.5 cm. long.

Calyx 8-10 mm. wide; drupe oval or subglobose, 10-18 mm. long.

1. *N. Krugii*.

2. *N. Sintenisii*.

3. *N. antillana*.

4. *N. membranacea*.

5. *N. patens*.

6. *N. coriacea*.

1. **Nectandra Krugii** Mez, Jahrb. Bot. Gart. Berlin 5: 422. 1889.

Nectandra discolor Griseb. Fl. Br. W. I. 282. 1860. Not Nees.

A tree, 10-25 m. high, the young twigs, branches of the inflorescence, calyx and petioles tomentose. Leaf-blades oblong-lanceolate to ovate-lanceolate, 11-25 cm. long, 3-9 cm. broad, acuminate at the apex, acute or obtuse at the base, tomentulose above when young, the primary nerves impressed, tomentulose especially on the veins beneath, the primary veins prominent, the petioles 1-2.3 cm. long; panicles axillary, long-peduncled, several-many-flowered; flowers 8-10 mm. in diameter; calyx white, its lobes oval to suborbicular, 4-4.5 mm. long, tomentulose on both sides; drupe narrowly elliptic, 1.5-1.8 cm. long, 8-10 mm. in diameter, dark violet, the cupule hemispheric.

Mountain forests, central and western districts of Porto Rico:—Guadeloupe; Dominica.

2. **Nectandra Sintenisii** Mez, Jahrb. Bot. Gart. Berlin 5: 419. 1889.

A tree, up to 20 m. high, the young twigs pubescent with short appressed hairs. Leaf-blades lanceolate to elliptic or ovate, 4.5-20 cm. long, 2-7.5 cm. broad, acute or acuminate at the apex, the tip obtuse, acute or obtuse at the base, glabrous, the primary veins few and rather distant, the secondary veins rather inconspicuously reticulate; petioles 5-15 mm. long; panicles usually long-peduncled, the branches spreading, glabrous or nearly so, usually many-flowered; pedicels 2-3 mm. long, slender; calyx white, its lobes obovate or elliptic, 3 mm. long, 1.5-1.8 mm. broad; drupe ellipsoid, 12 mm. long, 6 mm. in diameter; the base of the cupule verruculose. [*N. leucantha* of Bello, not of Nees.]

Forests at lower and middle elevations in moist or wet districts, Porto Rico; St. Thomas (according to Mez) but not found there by recent collectors:—Hispaniola.

3. **Nectandra antillana** Meissn. in DC. Prodr. 15⁴: 153. 1864.

Nectandra leucantha Griseb. Fl. Br. W. I. 282, in part. 1860.

A tree, up to 20 m. high, the trunk sometimes 8 or 9 dm. in diameter, the bark splitting into thick scales. Leaf-blades oblong to broadly lanceolate, rarely ovate, 6-23 cm. long, 2-8 cm. broad, acuminate at the apex, acute or rarely cordate at the base, glabrous or sometimes puberulent on the midrib beneath, the primary veins few, distant, flat above, prominent beneath, the secondary veins often

rather inconspicuous, the petioles 5–17 mm. long, more or less puberulent; panicles many-flowered, the branches spreading, puberulent; calyx-lobes spreading, roundish-obovate or suborbicular, 4–4.5 mm. long, tomentulose on both sides; drupe globose, 8–10 mm. in diameter, blue-black, the cupule red, saucer-shaped, 7–9 mm. in diameter.

Thickets and river-banks at low elevations in the southern districts of Porto Rico and recorded from the Sierra de Luquillo; St. Thomas;—Cuba; Jamaica; Hispaniola; Guadeloupe; Martinique; Barbados and Tobago. **BEDSTEAD-WOOD TREE.**

4. **Nectandra membranacea** (Sw.) Griseb. Fl. Br. W. I. 282. 1860.

Laurus membranacea Sw. Prodr. 65. 1788.

A tree, sometimes 20 m. high or higher, the young branches slender, ferruginous-strigillose. Leaf-blades oblong-lanceolate to elliptic, 8–24 cm. long, 2–8 cm. broad, acuminate at the apex, acute at the base, the primary veins more or less impressed above, rather prominent beneath, glabrous or sparingly puberulent on both sides, the petioles 5–15 mm. long; panicles axillary, often long-peduncled, the branches more or less strigillose, several-many-flowered, the pedicels 2–10 mm. long; calyx yellowish-white, its lobes ovate-elliptic, 1.5–1.7 mm. long, strigillose on the outside; drupe globose or subglobose, 1 cm. in diameter, black, the cupule saucer-shaped, 6–7 mm. broad, the pedicels thickened above to the diameter of the cupule.

Forests and hillsides in wet or moist districts, Porto Rico, ascending to higher elevations; St. Thomas and St. Croix (according to Eggers);—Jamaica; Hispaniola; Guadeloupe to Trinidad.

5. **Nectandra patens** (Sw.) Griseb. Fl. Br. W. I. 281. 1860.

Laurus patens Sw. Prodr. 65. 1788.

A shrub, or tree, sometimes 18 m. high, the young twigs puberulent. Leaf-blades elliptic-lanceolate to ovate or oval, coriaceous, 7–20 cm. long, 3–8 cm. broad, acute to acuminate at the apex, the tip usually obtuse, acute or occasionally rounded at the base, glabrous or sometimes with tufts of hairs in the axils of the veins below, reticulate-veined on both surfaces, the petioles 3–10 mm. long, puberulent; calyx-lobes elliptic, 2–2.5 mm. long, 1.2–1.5 mm. broad, white, pubescent on both sides; drupe oblong-ellipsoid, or oblong-ovoid, 2–2.5 cm. long, white, the cupule red.

Forests, river-valleys and wooded hills, Porto Rico, at lower and middle elevations in wet or moist districts;—Jamaica; Hispaniola; Martinique.

6. **Nectandra coriacea** (Sw.) Griseb. Fl. Br. W. I. 281. 1860.

Laurus coriacea Sw. Prodr. 65. 1788.

Oreodaphne coriacea Nees, Syst. Laur. 454. 1836.

Nectandra Willdenoviana Nees, Syst. Laur. 321. 1836.

A tree, up to 12 m. high, the trunk sometimes 3 dm. in diameter, the bark nearly smooth, light gray, the twigs slender, glabrous. Leaf-blades oblong, oblong-lanceolate or ovate-elliptic, coriaceous, 6–15 cm. long, 2–5.5 cm. broad, acute or acuminate at the apex, narrowed at the base, dark green and lustrous above, dull beneath, glabrous or very nearly so, reticulate-veined, the petioles 5–15 mm. long; panicles axillary, peduncled, puberulent, several-many-flowered; pedicels 4–7 mm. long; calyx white, its lobes oblong or ovate-oblong, obtuse, 3–4 mm. long; stamens shorter than the calyx; drupe oval or subglobose, dark blue or nearly black, 10–18 mm. long, the cupule red or yellow.

Woods, hillsides and arroyos at lower elevations, Porto Rico, in dry or moist districts; Vieques; Mona; St. Thomas; St. Croix; St. Jan; Tortola;—Florida; West Indies; Yucatan. Recorded by Bello as *Nectandra sanguinea* Rottb.

Laurus indica West, of St. Croix, is unknown to modern botanists.

Laurus longifolia Vahl, collected on St. Croix by West, is not further determined.

Cinnamomum zeylanicum Nees, CINNAMON TREE, of southern Asia, occasionally planted in Porto Rico and the Virgin Islands, a small tree, the reddish-brown bark the source of cinnamon, was recorded by Eggers as naturalized in shaded valleys on St. Croix, prior to 1879, but it does not appear to have been persistent.

Camphora Camphora (L.) Karst., CAMPHOR, of eastern Asia, occasionally planted in Porto Rico, and seen as seedlings at the St. Croix Agricultural Experiment Station in 1923, becomes about 8 m. in height, with a trunk up to about 3 dm. in diameter; its 3-nerved leaves are ovate to elliptic, 10 cm. long or less, acuminate and slender-petioled; its small white flowers are borne in axillary panicles and have 9 stamens; the globose drupe is about 8 mm. in diameter. The bark and leaves are the source of camphor [*Laurus Camphora* L.; *Cinnamomum Camphora* Nees & Eberm.].

Family 11. CASSYTHACEAE Dumort.

LOVE-VINE FAMILY.

Parasitic vines. Leaves none, or reduced to scales, the small regular and perfect flowers spicate, racemose, or capitate. Calyx 6-cleft, the lobes imbricated, in 2 series, the outer ones shorter than the inner. Corolla none. Perfect stamens 9, with 2-celled anthers; staminodes 3. Pistil 1; ovary 1-ovuled, becoming enclosed by the enlarging calyx-base; style simple; stigma small, mostly capitate. Fruit berry-like, fleshy. Only the following genus.

1. CASSYTHA L. Sp. Pl. 35. 1753.

Characters of the family. About 15 known species, of tropical regions. [Synonym of *Cuscuta*.] Type species: *Cassytha filiformis* L.

1. *Cassytha filiformis* L. Sp. Pl. 35. 1753.

Cassytha americana Nees, Syst. Laur. 664. 1836.

Slender, branched, often 5 m. long, or more, sometimes matted, yellow or yellowish-green, the stems about 2 mm. thick. Leaves mere ovate or lanceolate, acute scales 1-2 mm. long, few and distant; spikes peduncled, few-several-flowered, 1-2 cm. long; flowers white, about 2 mm. broad, the inner sepals ovate, larger than the outer; fruit globose, white, 5-7 mm. in diameter.

Sandy coastal thickets and dunes, Porto Rico; Icacos; Vieques; St. Thomas; St. Croix:—cosmopolitan in the tropics. LOVE-VINE.

Order 12. PAPAVERALES.

Mostly herbs, with clustered, regular and perfect flowers. Petals, with very rare exceptions, present, separate. Sepals usually separate. Stamens hypogynous. Ovary superior, free from the calyx, compound, composed of two united carpels, or more.

Sepals 2 (very rarely 3 or 4); endosperm fleshy.

Sepals or calyx-segments 4-8; endosperm none.

Capsule 2-celled by a longitudinal partition, usually 2-valved, rarely indehiscent.

Capsule 1-celled, of 2-6 carpels.

Style short or wanting; seeds wingless.

Style elongated; seeds winged.

Fam. 1. PAPAVERACEAE.

Fam. 2. BRASSICACEAE.

Fam. 3. CAPPARIDACEAE.

Fam. 4. MORINGACEAE.

Family 1. **PAPAVERACEAE** B. Juss.

POPPY FAMILY.

Herbs, with milky or colored sap, and alternate leaves or the upper rarely opposite. Stipules none. Flowers perfect, regular. Sepals 2 (rarely 3 or 4), caducous. Petals 4-6 or rarely more, imbricated, often wrinkled, deciduous. Stamens hypogynous, distinct; filaments filiform; anthers longitudinally dehiscent. Ovary 1, many-ovuled, mainly 1-celled; style short; ovules anatropous. Fruit a capsule, generally dehiscent by a pore, or by valves, rarely indehiscent. About 23 genera and 115 species, widely distributed, most abundant in the north temperate zone.

Petals large; capsule apically dehiscent.

1. *Argemone*.

Petals none; capsule dehiscent by 2 valves from the base.

2. *Bocconia*.

1. **ARGEMONE** L. Sp. Pl. 508. 1753.

Glaucous herbs, with yellow sap, spiny-toothed leaves and large flowers. Sepals 2 or 3. Petals 4-6. Stamens 8. Placentae 4-6, many-ovuled. Style very short. Stigma dilated, 3-6-radiate. Capsule prickly, oblong, dehiscent at the apex by valves. Seeds numerous, cancellate. [Greek, an eye disease, supposed to be relieved by the plant so called.] A genus of about 10 species, natives of the warmer parts of America. Type species: *Argemone mexicana* L.

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

Stem 3-6 dm. high, spiny or sometimes nearly unarmed. Leaves sessile, clasping by a narrowed base, 1-2.5 dm. long, glaucous, runcinate-pinnatifid, spiny-toothed and more or less spiny on the veins; flowers orange or yellow, sessile or subsessile, 2-8 cm. broad; sepals acuminate, bristly-pointed; capsule 2.5 cm. long or more; stigma sessile.

Waste and cultivated grounds. Porto Rico; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda:—southern United States; Bermuda; continental tropical America. MEXICAN POPPY. SISSLE. CARDO SANTO.

2. **BOCCONIA** L. Sp. Pl. 505. 1753.

Herbs or shrubs. Leaves pinnately nerved or lobed. Flowers small, in terminal much-branched panicles. Sepals 2. Petals wanting. Stamens 8-24. Placentas of the ovary 2. Ovule solitary, erect from the base. Stigmas 2, spreading. Capsule dehiscent by 2 valves from the base. Seed large and nearly filling the cavity, surrounded at the base with a soft cup-like aril; endosperm fleshy. [In honor of Dr. Paolo Bocconi, Sicilian botanist and author.] About 8 or 9 species, natives of the West Indies and continental tropical America. Type species: *Bocconia frutescens* L.

1. **Bocconia frutescens** L. Sp. Pl. 505. 1753.

A shrub, 1-3 m. high, with a yellow acrid sap. Leaves membranous, oblong-elliptic to broadly elliptic in outline, lobed or pinnatifid, 14-35 cm. long, 8-18 cm. broad, glabrous above, usually densely tomentose beneath when young, sometimes nearly glabrous in age, the lobes oblong, denticulate; upper leaves oblong or elliptic, repand or denticulate, sometimes entire; panicle 2.8-4 dm. long; sepals oblong-elliptic or elliptic, 7-8.5 mm. long; filaments filiform, the anthers linear, 4-5 mm. long; ovary stalked; fruit ellipsoid, 7-8 mm. long.

Cultivated ground, hillsides and forests at lower and middle elevations, Porto Rico:—Cuba; Jamaica; Hispaniola; St. Kitts to St. Vincent; Mexico to Peru. PAN CIMARRON. PARROT WEED. CELANDINE.

Eschscholtzia californica Cham., CALIFORNIA POPPY, occasionally grown in Porto Rico flower gardens as an annual, has leaves finely divided into linear segments and bright yellow flowers 5-8 cm. broad, the fruit a slender capsule.

Reseda odorata L., MIGNONETTE, native of northern Africa, occasionally grown for its fragrant flowers in Porto Rico and Virgin Island gardens, but not persistent, is a low herb of the related family **Resedaceae**, with cuneate, entire or lobed leaves, and small irregular greenish flowers in narrow racemes, the horned capsule lobed.

Family 2. **BRASSICACEAE** Lindl.

MUSTARD FAMILY.

Annual or perennial herbs, rarely somewhat woody, with watery acid sap, alternate leaves, and racemose or corymbose flowers. Sepals 4, deciduous, or rarely persistent, the 2 outer narrow, the inner similar, or concave, or saccate at the base. Petals 4, hypogynous, cruciate, nearly equal, generally clawed. Stamens 6, rarely fewer, hypogynous, tetradynamous. Pistil 1, compound, consisting of 2 united carpels, the parietal placentae united by a dissepiment; style generally persistent, sometimes none; stigma discoid or usually more or less 2-lobed. Fruit a silique or silicle, generally 2-celled, rarely 1-celled, in a few genera indehiscent. Seeds attached to both sides of the septum; endosperm none; cotyledons incumbent, accumbent or conduplicate. About 200 genera and over 1600 species, of wide geographic distribution.

Pod a silique or silicle, dehiscent into 2 valves.

Pod a short silicle, flattened contrary to the partition.

Pod a short or long silique, not flattened contrary to the partition.

Seeds 1-rowed; pod long-beaked.

Pod with a slender terete beak, its valves 1-nerved.

Pod with a compressed or angled beak, its valves 3-5-nerved.

Seeds in 2 rows in each cell; pod short-beaked.

Petals with a median nectary, usually yellow.

Petals without nectary, white.

Pod indehiscent, elongated, of 2 separating joints

1. *Lepidium*.

2. *Brassica*.

3. *Sinapis*.

4. *Radicula*.

5. *Sisymbrium*.

6. *Cakile*.

1. **LEPIDIUM** L. Sp. Pl. 643. 1753.

Erect or rarely diffuse herbs, with pinnatifid lobed or entire leaves and racemose white or whitish flowers. Stamens often fewer than 6. Petals short, sometimes none. Silicles oblong to orbicular, flattened contrary to the partition, winged or wingless; valves keeled, dehiscent. Seeds solitary in each cell, flattened; cotyledons incumbent or rarely accumbent. [Greek, a little scale, from the flat scale-like pods.] About 65 species, widely distributed. Type species: *Lepidium latifolium* L.

1. **Lepidium virginicum** L. Sp. Pl. 645. 1753.

Nasturtium virginicum Kuntze, Rev. Gen. Pl. 35. 1891.

Lepidium virginicum pinnatisectum O. E. Schulz in Urban, Symb. 3: 495. 1903.

Annual, erect, glabrous. Basal leaves obovate or spatulate in outline, pinnatifid, generally with a large terminal lobe and numerous small lateral ones, all dentate, glabrous or slightly pubescent; stem-leaves lanceolate or oblong-linear, sessile, or the lower stalked; flowers 1-2 mm. broad, white; petals generally present, sometimes wanting in the later flowers; pedicels slender, spreading, 4-6 mm. long in fruit; pod flat, short-oval or orbicular, minutely winged above; cotyledons accumbent.

Waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—continental North America; Bermuda; West Indies. [*Lepidium apetalum* of Millsbaugh, not of Linnaeus.] WILD PEPPER-GRASS. MASTUERZO.

Lepidium sativum L., PEPPER GRASS, European, is grown in Porto Rico and Virgin Island gardens as a condiment. It has pinnatifid leaves 7-15 cm. long, the upper much smaller, the ovate-oval pods winged all around.

2. **BRASSICA** L. Sp. Pl. 666. 1753.

Erect branching herbs, with pinnatifid basal leaves, and showy yellow flowers in elongated racemes. Siliques elongated, sessile, terete or 4-sided, tipped with an indehiscent conic, usually 1-seeded beak. Valves convex, 1-3-nerved. Seeds in 1 row in each cell, oblong, marginless; cotyledons conduplicate. [Latin name of the cabbage.] About 80 species, natives of Europe, Asia and northern Africa. Type species: *Brassica oleracea* L.

1. **Brassica integrifolia** (West) O. E. Schulz in Urban, Symb. Ant. 3: 509. 1903.

Sinapis integrifolia West, Bidr. St. Croix 296. 1793.

Sinapis lanceolata DC. Syst. Nat. 2: 611. 1821.

Sinapis brassicata Griseb. Fl. Br. W. I. 14. 1859. Not. L. 1768.

Glabrous or sparingly pilose below, pale green, slightly glaucous, 8 dm. high or less. Basal and lowest cauline leaves broadly obovate, or elliptic-obovate, coarsely dentate, obtuse, long-petioled, often 2-lobed near the base; upper leaves oblong to linear, few-toothed or entire, mostly acute, short-petioled or sessile; racemes loosely several-many-flowered, erect; pedicels filiform, 6-12 mm. long; petals light yellow, 6-9 mm. long, broadly obovate, clawed; pods erect-spreading, 3-4 cm. long, about 2 mm. thick, the slender beak 4-7 mm. long. [*B. juncea* of Cook and Collins].

Waste and cultivated grounds, Porto Rico; Mona; Vieques; Culebrita; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad. Native of Asia. WILD MUSTARD. MOSTAZA.

Brassica nigra (L.) Koch, BLACK MUSTARD, European and Asiatic, naturalized as an annual in temperate North America, was recorded by Krebs from St. Thomas in 1851, where it may have been cultivated. It has slender, short-pedicelled pods about 2 cm. long. [*Sinapis nigra* L.]

Brassica campestris L., NABO, TURNIP, European, occasionally planted in Porto Rico and the Virgin Islands, is biennial with rough leaves, large yellow flowers, the large fleshy roots various in shape in different races. [*B. rapa* L.]

Brassica Napus L., RAPE, European, similar to *B. campestris*, but with smooth foliage, was recorded by Krebs as found on St. Thomas, presumably planted.

Brassica oleracea L., COL, CABBAGE, grown for food in Porto Rico and the Virgin Islands, is also of European origin.

3. **SINAPIS** L. Sp. Pl. 668. 1753.

Annual or biennial, usually erect, branching, more or less hispid herbs, with pinnatifid or lobed leaves, and rather large, mostly yellow flowers in terminal racemes. Siliques linear, nearly terete, constricted between the seeds, sessile in the calyx, tipped with a flat sword-like beak which sometimes contains a seed near its base, its valves 3-5-nerved. Seeds oblong or subglobose, not winged nor margined. Cotyledons conduplicate. [Name Greek, said to come from the Celtic for turnip.] About 5 species, natives of southern Europe. Type species: *Sinapis alba* L.

Leaves lyrate-pinnatifid; fruiting pedicels 8-14 mm. long.
Leaves dentate or lobed; fruiting pedicels 4-6 mm. long.

1. *S. alba*.

2. *S. arvensis*.

1. *Sinapis alba* L. Sp. Pl. 668. 1753.

Erect, 3–6 dm. high, more or less pubescent with stiff spreading hairs. Lower leaves 1.5–2 dm. long, obovate in outline, deeply pinnatifid or pinnate, with a large terminal leaflet or lobe and several pairs of smaller lateral ones, dentate all around; uppermost leaves lanceolate or oblong, merely dentate, short-petioled; flowers yellow, 14–18 mm. broad; pedicels rather stout, spreading, 10–14 mm. long in fruit; pods spreading or ascending, terete, constricted between the seeds; beak flat, equalling or sometimes longer than the pod; seeds light brown.

Spontaneous in fields along the coast near Dorado, found only by Sintenis; recorded by Krebs from St. Thomas, in 1852. Not persistent in tropical regions. United States. Native of Europe. WHITE MUSTARD.

2. *Sinapis arvensis* L. Sp. Pl. 668. 1753.

Brassica Sinapistrum Boiss. Voy. Esp. 2: 39. 1839–45.

Erect, 3–6 dm. high, hispid with scattered stiff hairs, or glabrate. Leaves oblong to elliptic, dentate, denticulate or subpinnatifid; flowers 1–1.6 cm. broad; pedicels stout; pods glabrous, spreading or ascending, somewhat constricted between the seeds, 1–1.6 cm. long, 2 mm. wide, tipped with a flattened elongated conic often 1-seeded beak 10–12 mm. long, the valves strongly nerved.

Naturalized near Anguilla, St. Croix prior to 1879 (according to Eggers); not found by subsequent collectors:—Bermuda; Bahamas; Jamaica; Cuba; North America. Native of Europe. CHARLOCK.

4. **RADICULA** Hill, Brit. Herb. 264. 1756.

Branching herbs, with simple or pinnate, lobed dissected or rarely entire leaves, and small yellow flowers. Sepals spreading. Stamens 1–6. Pods short, terete or nearly so. Stipe none. Valves nerveless or 1-nerved. Style short or slender. Stigma 2-lobed or nearly entire. Seeds turgid, minute, in 2 rows in each cell or very rarely in 1 row. Cotyledons accumbent. [Name Latin, diminutive of radix, root.] About 50 species, of wide geographic distribution, most abundant in the north temperate zone, known as YELLOW-CRESS. Type species: *Sisymbrium amphibium* L.

Pods linear, 4.5–12 mm. long, 1.1–1.8 mm. broad; pedicels much shorter than the pods.

Pods short-elliptic, 2.5–5 mm. long, 2–2.5 mm. broad; pedicels equalling or longer than the pods.

1. *R. portoricensis*.

2. *R. glabra*.

1. *Radicula portoricensis* (Spreng.) Britton.

Nasturtium palustre brevipes DC. Syst. 2: 192. 1821.

Nasturtium portoricense Spreng. Syst. 2: 882. 1825.

Nasturtium brevipes Griseb. Mem. Amer. Acad. II. 8: 154. 1860.

Radicula brevipes Britton, Torreya 6: 30. 1906.

Annual, 1–3 dm. tall, glabrous or sparingly pubescent below, branched from the base, the branches usually prostrate or nearly so, slender, 3 dm. long or less. Leaves pinnately divided into several or numerous, oblong, ovate or suborbicular dentate segments, or the upper segments confluent; racemes several-many-flowered, 6–12 cm. long; pedicels about 1 mm. long; flowers about 1.5 mm. long; petals minute or wanting; pods linear, 4.5–12 mm. long, about 1.5 mm. wide.

Wet grounds, river-banks and waste places, Porto Rico:—Bahamas; Cuba; Hispaniola.

2. **Radicula palustris** (L.) Moench, Meth. 263. 1794.*Nasturtium amphibium palustre* L. Sp. Pl. 687. 1753.*Nasturtium palustre* DC. Syst. 2: 191. 1821.

Annual, 2.5–5 dm. tall, the glabrous stem often rather stout, branched above the base, the branches 1–2.5 dm. long. Leaves pinnately divided; flowers yellow; pedicels 4–5 mm. long, equalling or longer than the pods; pods short-elliptic, 2.6–5 mm. long, 2–2.5 mm. broad.

Waste grounds, Dos Bocas and Santurce, Porto Rico;—north temperate zone.

5. **SISYMBRIUM** [Tourn.] L. Sp. Pl. 657. 1753.

An aquatic or uligenous herb, with pinnately divided leaves, and small, white flowers in terminal racemes. Pods linear to linear-oblong, slender-pedicelled, tipped with the rather stout style, the valves nerveless. Seeds in 2 rows in each cell of the pod; cotyledons accumbent. [Ancient Greek name.] A monotypic genus of the Old World.

1. **Sisymbrium Nasturtium-aquaticum** L. Sp. Pl. 657. 1753.*Cardamine fontana* Lam. Encycl. 2: 185. 1786.*Nasturtium officinale* R. Br. in Ait. Hort. Kew. ed. 2, 4: 110. 1812.*Nasturtium fontanum* Aschers. Fl. Brand. 32. 1864.*Nasturtium roridulum* Bello. Anales Soc. Hisp. Nat. 10: 236. 1881.*Nasturtium Nasturtium* Cockerell, Bull. Torr. Club 19: 95. 1892.*Rorida Nasturtium* Rusby, Mem. Torr. Club 3³: 5. 1893.

Glabrous, rooting from the nodes. Leaves odd-pinnate, of 3–9 segments, the terminal one larger than the lateral, all obtuse, ovate or oval, or the terminal one nearly orbicular; flowers white, 4–5 mm. broad; pods 1.2–3.5 cm. long, 2 mm. wide, slightly curved upward, on pedicels of about their length.

In rivulets, Porto Rico; St. Croix; St. Thomas;—Cuba; Jamaica; Hispaniola; Martinique; Dominica; St. Vincent; Barbados. Widely distributed in continental America. Native of Europe and Asia. Used for salad. WATER-CRESS. BERROS.

6. **CAKILE** [Tourn.] Mill. Gard. Dict. abr. ed. 4. 1754.

Annual glabrous fleshy herbs, with purplish or white flowers. Siliques elongated, flattened or ridged, indehiscent, 2-jointed, the joints 1-celled and usually 1-seeded. Style none; cotyledons accumbent. [Old Arabic name.] A genus of about 3 species, natives of sea and lake shores of Europe and North America. Type species: *Bunias Cakile* L.

1. **Cakile lanceolata** (Willd.) O. E. Schulz in Urban, Symb. Ant. 3: 504. 1903.*Raphanus lanceolatus* Willd. Sp. Pl. 3: 562. 1801.*Cakile aequalis* L'Her. DC. Syst. 2: 430. 1821.*Cakile lanceolata domingensis* O. E. Schulz in Urban, Symb. Ant. 3: 505. 1903.*Cakile lanceolata integrifolia* O. E. Schulz, loc. cit. 3: 507. 1903.

Erect or ascending, often much branched, 8 dm. high or less. Basal and lower leaves broadly oblong, obtuse, 5–8 cm. long, coarsely crenate-dentate; upper leaves smaller, narrowly obovate to oblong, crenate-dentate or entire; flowers pale purplish, 6–10 mm. broad; fruiting racemes often 3 dm. long; fruiting pedicels stout, ascending, 4–6 mm. long; pod 1.5–3 cm. long, its upper joint 1½–4 times as long as the lower. [*Cakile americana* of Krebs, not of Nuttall.]

Coastal sands and rocks, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—southern United States; Bermuda; West Indies and northern South America. MOSTACILLA DEL MAR. SEA-ROCKET.

Raphanus sativus L., RADISH, RÁBANO, European, grown in Porto Rico and Virgin Island gardens, is biennial with a fusiform or napiform root, lyrate-pinnatifid leaves and pink or white flowers 1-2 cm. broad, the fleshy indehiscent pods with a long conic beak.

Raphanus Raphanistrum L., JOINTED CHARLOCK, European, recorded by West as formerly found on St. Croix, is otherwise unknown in the West Indies, but found in Bermuda; it resembles the preceding species, but has a deep slender root and yellow flowers. It is widely naturalized as a weed in continental North America.

Koniga maritima (L.) R. Br., SWEET ALYSSUM, commonly grown for ornament in Porto Rico and Virgin Island gardens, is a low perennial, its stems procumbent or ascending, 1-3 dm. high, its linear or lanceolate, entire leaves 1-5 cm. long; its fragrant white flowers are 4-5 mm. wide, in terminal racemes, the oval pods 2-3 mm. long. [*Clypeola maritima* L.; *Alyssum maritimum* Lam.]

Iberis amara L. CANDY TUFT, European, grown as a garden flower in Porto Rico, is a low annual with white or purplish corymbose flowers, the pods small, 2-lobed.

Family 3. CAPPARIDACEAE Lindl.

CAPER FAMILY.

Herbs, shrubs or trees, with alternate or rarely opposite leaves, and regular or irregular, mostly perfect flowers. Sepals 4-8, free or more or less united. Petals 4, or rarely more, or sometimes wanting. Receptacle elongated or short. Stamens 4-∞; filaments distinct or united at the base and sometimes adnate to the stalk of the ovary. Style generally short. Ovules ∞, on parietal placentae. Fruit a capsule, or indehiscent, or irregularly rupturing. Seeds various; endosperm none; embryo generally coiled. About 35 genera and 450 species, mostly of warm regions.

Mostly annual herbs (sometimes shrubby); fruit a longitudinally dehiscent capsule.

Shrubs and trees; fruit indehiscent or irregularly rupturing.

Sepals free, or the two outer united.

Sepals united.

1. *Cleome*.

2. *Capparis*.

3. *Morisonia*.

1. **CLEOME** L. Sp. Pl. 671. 1753.

Glabrous or glandular herbs or low shrubs. Leaves digitately 3-7 foliolate or simple. Flowers solitary or in leafy-bracted racemes. Calyx 4-divided or of 4 sepals. Petals 4, nearly equal, entire, more or less clawed. Stamens 4-30, sometimes borne on a gynophore. Ovary stalked or sessile. Capsule elongated, many-seeded. Seeds conduplicate, with a rugose, ridged, or tuberculate testa. [Derivation uncertain.] About 75 species, mainly natives of tropical regions, especially American and African. Type species: *Cleome gynandra* L.

1. Stamens borne on a gynophore; petals white or pink.

Bracts trifoliate; petals 1-1.5 cm. long.

Bracts simple; petals 2.5-3.5 cm. long.

2. Stamens borne below the gynophore.

Stamens 4-6.

Leaves 3-7-foliate.

Stipular prickles 2; petals white to purple.

Leaflets 5 or 7, rarely 3; gynophore 2.5-5 cm. long.

Leaflets 3; capsule sessile.

Without prickles; leaflets 3; gynophore 0.5-1 cm. long.

Leaves simple; petals yellow.

Stamens 12-20; petals yellow.

1. *C. gynandra*.

2. *C. speciosa*.

3. *C. spinosa*.

4. *C. aculeata*.

5. *C. ciliata*.

6. *C. stenophylla*.

7. *C. icosandra*.

1. *Cleome gynandra* L. Sp. Pl. 671. 1753.

Cleome pentaphylla L. Sp. Pl. ed. 2, 938. 1763.

Pedicellaria pentaphylla Schrank; Roem. & Ust. Mag. Bot. 8: 11. 1790.

Gynandropsis pentaphylla DC. Prodr. 1: 238. 1824.

Gynandropsis gynandra Briquet, Ann. Cons. Jard. Bot. Geneve 17: 382. 1914.

An erect, glandular-pubescent, annual herb. Stem 5–10 dm. tall, branching; leaves digitately 3- or 5-foliolate; leaflets elliptic to oval or obovate, 2–6 cm. long, 1–3.5 cm. broad, obtuse, acute or short-acuminate at the apex, narrowly or broadly cuneate at the base, entire or minutely denticulate; racemes 1–4 dm. long; bracts trifoliolate; sepals lanceolate, 3.5–5 mm. long, acuminate; petals not imbricate in bud, white or pink, 1–1.5 cm. long, the blades often longer than the claws; stamens 6, inserted upon the filiform gynophore; capsule cylindrical, 4–9 cm. long, 2.5–4 mm. thick, gynophore 1.8–3 cm. long, the upper part often only half as long as the lower; pedicels glandular-pubescent, 1–2.3 cm. long; seeds 1.5–2 mm. broad, coarsely rugose and muricate. [? *C. pubescens* of Krebs.]

Waste and cultivated grounds, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan.—southern United States; Bermuda; West Indies; continental tropical America. Native of the Old World. SMALL SPIDER-FLOWER. JASMIN DEL RIO. WHITE MASSAMBEE.

2. *Cleome speciosa* H. B. K. Nov. Gen. 5: 84. 1821.

Gynandropsis speciosa DC. Prodr. 1: 238. 1824.

An erect glabrous or pubescent herb. Leaves digitately 5- or 7-foliolate; leaflets narrowly elliptic to lanceolate, 6–14 cm. long, 2–4 cm. broad, sometimes larger, acuminate to long-acuminate at the apex, cuneate at the base, entire or minutely toothed; racemes 1–3.5 dm. or more long; bracts simple, ovate to orbicular, cordate at the base; sepals narrowly lanceolate, 4–6 mm. long, acuminate; petals imbricate in bud; pink or occasionally white, 2.5–3 cm. long, the blades longer than the claws; stamens 6, inserted upon the filiform gynophore; capsule 6–10 cm. long, about 4 mm. thick; gynophore 5–6.5 cm. long, the upper part about 6 or 7 times as long as the lower; pedicels glabrous or nearly so, 1.5–4.5 cm. long; seeds about 3 mm. in diameter, often muricate.

Spontaneous after cultivation in Porto Rico.—Jamaica; Guadeloupe; Martinique. Native of continental tropical America. VOLATINES PRECIOSOS.

3. *Cleome spinosa* Jacq. Enum. 26. 1760.

Cleome pungens Willd. Enum. Hort. Berol. 2: 689. 1809.

Cleome spinosa f. *pungens* Eichl. in Mart. Fl. Bras. 13: 253. 1865.

A more or less glandular-pubescent herb 6–15 dm. high. Leaves 5- or 7-foliolate, the lower long-petioled, the upper passing into the simple ovate or roundish subcordate bracts of the raceme; petioles often with 2 prickles at the base; leaflets lanceolate, 2.5–9 cm. long, 0.7–3 cm. broad, acuminate at the apex, cuneate or inequilaterally rounded at the base; racemes 1 dm. long or longer; flowers long-pedicelled; sepals narrowly lanceolate, 7–8 mm. long; petals purplish or whitish, obovate, about 2 cm. long, long-clawed; stamens 6, inserted upon a conic disk below the filiform gynophore of the ovary; stigma sessile; pedicels 2–3.4 cm. long, more or less glandular pubescent; capsule usually longer than the gynophore, 6–13 cm. long, 3–3.5 mm. thick; seeds about 2 cm. broad.

Waste and cultivated grounds, Porto Rico; St. Croix; St. Thomas; St. Jan.—southern United States; Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America. Recorded from tropical Africa. SPIDER FLOWER. JASMIN DEL RIO. SAMBO. VOLATINES PUNZANTES. WILD MASSAMBEE.

4. *Cleome aculeata* L. Syst. ed. 12, 232. 1768.

A diffuse glandular-puberulent herb, 2.5–9 dm. tall, with stipular prickles. Lower leaves digitately 3-foliolate, the upper passing into the simple ovate or oval, often subcordate, sessile bracts; leaflets elliptic, obovate or elliptic-ovate,

1.5–6.5 cm. long, 0.8–3.5 cm. broad, obtuse or acutish at the apex, more or less inequilateral at the base; flowers solitary, axillary; sepals narrowly lanceolate, or oblong, 2–3 mm. long; petals white, about 5 mm. long, clawed; stamens 6, inserted upon the disk; capsule linear-cylindric, 2.5–5.5 cm. long, 3–4 mm. thick, subsessile, striate, the filiform pedicel 1–2.5 cm. long; seeds reticulate-tuberculate, about 2.5 mm. in diameter.

Waste ground near Isabel Segunda, Vieques:—Hispaniola; Guadeloupe; Dominica; Martinique; Grenada; Trinidad; South America and tropical Africa.

5. **Cleome ciliata** Schum. & Thom. Vid. Selsk. Afh. 4: 68. 1829.

An erect or sometimes trailing, glabrous or sparsely pilose herb. Leaves digitately 3-foliolate, rarely 5-foliolate, the lower ones long-petioled, the upper sessile or nearly so; leaflets elliptic or lanceolate; 9–25 mm. long, 4.5–12 mm. broad, acute or obtuse at the apex, more or less cuneate and often inequilateral at the base, minutely or obsoletely ciliolate; flowers solitary, axillary; sepals narrowly lanceolate, 2.7–3 mm. long; petals 5–6 mm. long, white or white-lilac; stamens 6; capsule linear-cylindric, 2.5–6 cm. long, about 3.5 mm. thick, prominently nerved, several times longer than the short gynophore; pedicels slender, 13–20 mm. long; seeds transversely ridged, 1.5–2 mm. in diameter.

Waste and cultivated grounds, Tortola; Virgin Gorda:—Jamaica. Native of tropical Africa.

6. **Cleome stenophylla** Klotzsch; Urban, Symb. Ant. 4: 251. 1905.

Physothemon lanceolatum Eichl. in Mart. Fl. Bras. 13: 244, in part. 1865.

An erect glabrous branching annual, 12–40 cm. high. Leaves simple, linear, 2.5–5 cm. long, 1–4.5 mm. broad, acute at the apex, obtuse at the base, jointed with the petiole, the margin more or less revolute; flowers axillary; sepals oblong, 2.8–3 mm. long, acuminate; petals yellow, elliptic-oblong, 4–4.5 mm. long, 1.5–1.8 mm. broad; filaments filiform, the anthers elliptic; capsule sessile, linear-cylindric, 1–3.5 mm. long, longitudinally nerved; seeds about 1.2 mm. in diameter, tuberculate and ridged.

Dry open places at low elevations, southwestern dry districts of Porto Rico:—St. Barts; Bonaire; Curaçao; Guiana.

7. **Cleome icosandra** L. Sp. Pl. 672. 1753.

Cleome viscosa L. Sp. Pl. 672. 1753.

Polanisia viscosa DC. Prodr. 1: 242. 1824.

Polanisia icosandra Wight & Arn. Prodr. 22. 1834.

An erect viscid-glandular annual, 3–9 dm. tall. Leaves digitately 3- or 5-foliolate; leaflets obovate, oblanceolate or elliptic, 1–7.5 cm. long, 0.7–3 cm. broad, acute to acuminate, rarely obtuse at the apex, often inequilateral at the base, the margin glandular-ciliate; flowers solitary in the axils of the upper leaves; sepals oblong-lanceolate or lanceolate 6.5–8 mm. long; petals yellow, obovate, about 1 cm. long; stamens 12–20, free; capsule cylindric, 5.5–10 cm. long, 4–4.5 mm. thick; tapering to the apex, striate; viscid-glandular; seeds about 1.8 mm. in diameter, flattened, transversely ridged.

Waste and cultivated grounds, St. Croix; St. Thomas; Tortola:—Bermuda; Cuba; Jamaica; St. Martin to Tobago. Naturalized from the Old World tropics.

Cleome serrata Jacq., [*C. triphylla* DC.] listed by Krebs as found in St. Thomas prior to 1851, is not otherwise recorded within the geographical area of this Flora, and is not known to exist in St. Thomas now. It occurs in Jamaica, Cuba, Hispaniola and continental tropical America.

2. **CAPPARIS** L. Sp. Pl. 503. 1753.

Trees or shrubs, with simple, mostly coriaceous leaves, sometimes stipulate on young or barren shoots, and large corymbose, mostly white flowers. Sepals 4, distinct or partly united, often with a gland at the base. Petals 4, distinct, imbricated. Stamens several or usually many, the filaments filiform, the anthers short. Ovary stalked, 1-4-celled; ovules few or many, usually on 2 parietal placentae; style none; stigma depressed. Fruit elongated-linear, or oblong, or short and subglobose, indehiscent, or irregularly rupturing. Seeds without endosperm; embryo convolute; cotyledons fleshy. [From the Greek name of the Caper-tree, *Capparis spinosa* L., of Europe.] About 150 species, natives of tropical and subtropical regions, in Porto Rico known as BURRO. Type species: *Capparis spinosa* L.

Leaves scaly beneath; calyx-lobes not imbricated.

Calyx-lobes open in bud, 2-2.8 mm. long; petals densely stellate-tomentose on the back.

Sepals distinct, valvate, 8-12 mm. long, nearly as long as the petals; petals densely peltate-scaly on the back.

Leaves glabrous; calyx-lobes imbricated.

Calyx 5-6 mm. broad; stamens as long as the petals or slightly longer.

Calyx 1 cm. or more broad; stamens much longer than the petals.

Fruit torulose, long-linear, 6-20 cm. long, 1-1.5 cm. thick; leaf-blades coriaceous, linear to elliptic, rounded or acute at the base.

Fruit not torulose.

Fruit oblong, compressed, 10-18 cm. long, 3 cm. broad; leaf-blades rigid-coriaceous, elliptic to oval, rounded and usually subcordate at the base.

Fruit elliptic or obovate, 3-6 cm. long, 1.5-2 cm. broad; leaf-blades subcoriaceous, elliptic to oval or obovate, obtuse or acute at the base.

1. *C. indica*.
2. *C. cynophallophora*.
3. *C. baducca*.
4. *C. flexuosa*.
5. *C. coccolobifolia*.
6. *C. portoricensis*.

1. **Capparis indica** (L.) Fawc. & Rendle, Journ. Bot. 52: 144. 1914.

Breynia indica L. Sp. Pl. 503. 1753.

Capparis Breynia L. Syst. ed. 10, 1071. 1759.

Capparis amygdalifolia Jacq. Enum. 24: 1760.

Capparis amygdalina Lam. Encyc. 1: 60S. 1785.

A shrub or small tree 2-8 m. tall, the angled twigs densely scaly. Leaves narrowly elliptic to elliptic or obovate, 5-11 cm. long, 2-4.5 cm. broad, acute or occasionally obtuse at the apex, acute or obtuse at the base, glabrous and rather faintly reticulate-veined above, silvery-scaly beneath, the lateral veins usually distinct; petioles scaly, 4-16 mm. long; corymbs few-flowered; pedicels scaly, 5-15 mm. long; flowers fragrant; calyx small, scaly, 4.5-5.5 mm. in diameter, deeply 4-cleft, the lobes narrowly triangular, 2-2.8 mm. long, acute, open in bud; petals white, elliptic or obovate, 10-12 mm. long, scaly-tomentose on the back, tomentose on the inside; fruit linear, torulose, dry, 5-25 cm. long, 6-7 mm. wide, scaly. [*C. furfuracea* of Sessé and Moçino; *C. Grisebachii* of Millspaugh.]

Thickets, woods and hillsides at lower elevations, eastern and southern districts of Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Jamaica; St. Barts to Barbados; continental tropical America. LINGUAM.

2. **Capparis cynophallophora** L. Sp. Pl. 504. 1753.

Capparis siliquosa L. Syst. ed. 10, 1071. In part. 1759.

Capparis jamaicensis Jacq. Enum. 23. 1760.

Capparis torulosa Sw. Prodr. 81. 1788.

Capparis emarginata A. Rich. in Sagra, Hist. Cuba 10: 28. 1845.

Capparis jamaicensis emarginata Griseb. Fl. Br. W. I. 18: 1859.

Capparis jamaicensis siliquosa Griseb. loc. cit. 1859.

Capparis jamaicensis marginata Eggers, Bull. U. S. Nat. Mus. **13**: 25. 1879.

Capparis Breynia Sw. Obs. 210. 1791. Not L. 1759.

Capparis Breynia atropurpurea Bello, Anal. Soc. Esp. Hist. Nat. **10**: 237. 1881.

Capparis Breynia rosca Bello, loc. cit. 1881.

A shrub or a tree up to about 15 m. high, with a trunk diameter reaching 2 or 3 dm., the dark brown, furrowed, the slender, angular twigs densely scaly. Leaves elliptic or oblong, coriaceous, 4–12 cm. long, 2–6 cm. wide, or those of shoots narrowly linear, sometimes 3 dm. long and only 3–10 mm. wide, acute, obtuse or emarginate at the apex, narrowed at the base, glabrous and shining above, densely silvery-scaly and with the lateral venation usually obsolete beneath, the scaly petioles 1–3 cm. long; corymbs few—several-flowered; pedicels stout, scaly, 0.5–3 cm. long; flowers fragrant; flower-bud 4-angled; sepals distinct, valvate, 8–12 mm. long, densely scaly, reflexed, nearly as long as the white petals; stamens numerous, purplish, 2–3 times as long as the petals, the anthers yellow; fruit narrowly linear, scaly, torulose, drooping, 8 cm.—3.5 dm. long, 6–8 mm. thick, irregularly rupturing, scarcely fleshy, usually much longer than the gynophore. [*C. linearis* of West; *C. nitida* of Sessé & Mocino; ? *C. intermedia* of Krebs.]

Coastal hills and thickets, Porto Rico; Mona; Descheo; Icaos; Culebra; St. Croix; St. Thomas; St. Jan; Tortola:—Florida; West Indies; also recorded from Mexico, Central America and northern South America. BLACK WATTLE. BLACK WILLOW. BEJUCO INGLÉS. Consists of many races, differing mainly in size and shape of leaves.

3. *Capparis baducca* L. Sp. Pl. 504. 1753.

Capparis frondosa Jacq. Enum. 24. 1760.

A glabrous shrub, or a small tree sometimes 8 m. tall. Leaves elliptic-oblong, occasionally elliptic-obovate, coriaceous, 0.8–3 dm. long, 3.5–9.5 cm. broad, acute or acuminate at the apex, rounded and subcordate at the base, reticulate-veined on both sides, the petioles 0.5–5 cm. long; corymbs few—several-flowered; pedicels 6–14 mm. long; flowers odorless; calyx small, 5–6 mm. in diameter, the lobes suborbicular, imbricated at the base, 1.5–2 mm. long; petals obovate, 9–11 mm. long, 7–8 mm. broad, pale greenish white or purplish; stamens as long as the petals; fruit short, narrowly oblong, 3–7.5 cm. long; irregularly nodose-torose.

Woods and thickets in moist districts, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan (according to Eggers); Tortola:—Cuba; Jamaica; Hispaniola to Trinidad; Central and South America. RAT-BEAN. SAFO.

4. *Capparis flexuosa* L. Sp. Pl. ed. 2, 722. 1762.

Capparis cynophallophora L. Syst. ed. 10, 1071. In part. 1759. Not *C. cynophallophora* L. 1753.

Capparis hastata L. Sp. Pl. ed. 2, 722. 1762.

Capparis saligna Vahl, Symb. **3**: 66. 1794.

Capparis pauciflora H. B. K., Nov. Gen. **5**: 89. 1821.

Capparis cynophallophora saligna Griseb. Fl. Br. W. I. **18**. 1859.

Capparis cynophallophora normalis Eichl. in Mart. Fl. Bras. **13**: 282. 1865.

Capparis cynophallophora angustifolia Eichl. loc. cit. 283. 1865.

Capparis cynophallophora microphylla Eichl. loc. cit. 1865.

Capparis cynophallophora longifolia Bello, Anal. Soc. Hist. Nat. **10**: 237. 1881.

Capparis cynophallophora biflora Bello, loc. cit. 1881.

Capparis cynophallophora triflora Bello, loc. cit. 1881.

Capparis cynophallophora elliptica Bello, loc. cit. 1881.

Capparis cynophallophora mollis Bello, loc. cit. 1881.

A glabrous shrub, or a tree up to 9 m. high, with a trunk 2 dm. in diameter, the bark brown, the branches slender, sometimes vine-like. Leaves elliptic to oblong, lanceolate to linear, coriaceous, 4–12 cm. long, 1–5.2 cm. broad, obtuse,

emarginate or sometimes acute at the apex, rounded or narrowed at the base, reticulate-veined on both sides, the rather stout petioles 3–11 mm. long, with a small sessile, oblong or subglobose gland in the axil; corymbs few-flowered; pedicels stout, 12 mm. long or less; flowers fragrant; sepals suborbicular, 4–7 mm. long, imbricated the outer smaller than the inner; petals white to rose, obovate, 1.5–2 cm. long; stamens numerous, about 3 times as long as the petals, the filaments white; fruit long-linear, 6–20 cm. long, 1–1.5 cm. thick, more or less torulose, about twice as long as the slender gynophore, tardily opening longitudinally its pulp scarlet.

Woods, hillsides and thickets at lower elevations near the coasts, mostly in dry districts, Porto Rico; Mona; Desecheo; Icaos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida; West Indies; continental tropical America. CAPER-TREE. PALINGUAN. Consists of many races, differing mainly in size and shape of leaves.

5. *Capparis coccolobifolia* Mart.; Eichl. in Mart. Fl. Bras. 13¹: 284. 1865.

Capparis cynophallophora latifolia Griseb. Fl. Br. W. I. 18. 1859.
Capparis latifolia Stahl, Est. 2: 186. 1884.

A shrub 3–5 m. high, or a small tree sometimes attaining a height of 10 m., the bark gray, smooth. Leaves oblong-elliptic to oval, occasionally elliptic-ovate, coriaceous, 5–11 cm. long, 3–8.5 cm. broad, obtuse or rounded and often notched at the apex, rounded and frequently subcordate at the base, reticulate-veined and glabrous on both sides, the stout petioles 5–10 mm. long, usually with a small capitate gland in the axil; corymbs few-flowered; pedicels stout, 6–20 mm. long, minutely puberulent; calyx often minutely puberulent, especially near the base, the lobes suborbicular, 4–6 mm. long, imbricated, the outer smaller than the inner; petals white, elliptic to oval, 1.8–2.3 cm. long, 13–15 mm. broad, rounded at the apex, glabrous; stamens numerous, about 3 times as long as the petals; fruit oblong, compressed, 10–18 cm. long, 3 cm. broad.

Woods, thickets and arroyos, eastern and southern dry districts of Porto Rico at lower elevations; Vieques; Culebra; St. Croix; St. Thomas; St. Jan.—Antigua to Trinidad; Curaçao; northern South America. BROAD-LEAVED CAPER-TREE.

6. *Capparis portoricensis* Urban, Symb. Ant. 1: 309. 1899.

Capparis cynophallophora acutifolia Bello, Anal. Soc. Esp. Hist. Nat. 10: 237. 1881.

A tree 6–20 m. tall, the young twigs glabrous or minutely puberulent. Leaves elliptic to oval, or obovate, subcoriaceous, 4–11.5 cm. long, 2.5–5.5 cm. broad, rounded, obtuse or short and obtusely acuminate at the apex, obtuse or acute at the base, glabrous on both sides, the petioles 5–10 mm. long; inflorescence few-flowered; pedicels 7–15 mm. long; sepals biseriolate, orbicular, the outer 6 mm. long, the inner 12–14 mm. long; petals white, obovate-oblong, 2 cm. long or longer, about 1 cm. broad; fruit elliptic or obovate, 3–6 cm. long, 1.5–2 cm. broad. [*C. verrucosa* of Stahl; ? *C. baduoca* Sessé & Moçino; mistaken by Cook & Collins and illustrated for *C. cynophallophora* L.]

Woods and thickets, southwestern dry districts of Porto Rico, at lower elevations; Vieques; St. Jan.—Dominica. The wood is nearly white, rather hard and heavy. BURRO BLANCO.

Capparis verrucosa Jacq. is recorded from St. Thomas by Grisebach and from the Virgin Islands by Eggers, but has not been detected on any island of the archipelago by recent collectors.

Capparis ferruginea L., a shrub or small tree of Jamaica, Cuba and Hispaniola, with oblong-lanceolate leaves densely covered with stellate hairs, was erroneously recorded by Krebs as found in St. Thomas.

Capparis tenuisiliqua Jacq., of the southern West Indies and northern South America, was also recorded by Krebs as found in St. Thomas; if so, it must have been planted there.

Capparis spinosa L. CAPER BUSH, native of the Mediterranean region, a spiny shrub, the flower buds of which, pickled, are the capers of commerce, also recorded by Krebs as found in St. Thomas, may have been planted there.

Capparis eustachiana Jacq., of St. Eustatius and recorded from Antigua, was also listed by Krebs as found in St. Thomas.

3. *MORISONIA* L. Sp. Pl. 503. 1753.

Unarmed trees or shrubs with simple coriaceous leaves. Calyx irregularly rupturing into 2 valves or 2-4-cleft. Petals 4. Stamens 6-20, the filaments subulate, inserted on the disc; anthers oblong. Ovary 1-celled, or the 4 parietal placentas meeting in the center and making it falsely 4- or 8-celled. Ovules ∞ ; stigma discoid; sessile. Berry subglobose. Seeds ∞ ; testa crustaceous; cotyledons fleshy, convolute; radicle fusiform. [Dedicated to Robert Morison, 1620-1683, professor of botany at Oxford.] About 5 species, natives of the West Indies and South America. Type species: *Morisonia americana* L.

1. *Morisonia americana* L. Sp. Pl. 503. 1753.

A shrub or small tree, sometimes 10 m. high, the twigs and foliage scaly when young, glabrous in age. Leaves coriaceous, oblong to oblong-elliptic, 8-25 cm. long, 2.5-9.5 cm. broad, rounded, obtuse or occasionally rather abruptly and bluntly acuminate at the apex, rounded and frequently subcordate at the base, finely and often rather indistinctly reticulate-veined on both surfaces; petioles 2-6 cm. long, slightly enlarged at both base and apex; corymbs short-stalked, the branches scaly; calyx closed in the ovoid bud, bifid by rupture, about half as long as the white petals; petals obovate, 1-1.2 cm. long, 5.5-6 mm. broad, scaly on the back, more or less downy within; ovary longitudinally striate; fruit subglobose, 3.5-4 cm. or more in diameter; seeds 7-10 mm. in diameter. [*M. americana subpellata* of Eggers.]

Wooded hillsides, Desecheo; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Lesser Antilles; northern South America. WILD MESPILL.

Crataeva Tapia L., GARLIC PEAR-TREE, of Jamaica and continental tropical America, was recorded by Krebs as formerly found in St. Thomas; if the record is correct, it must have been planted there. *Crataeva* differs from *Capparis* in having 3-foliolate leaves and globose berries.

Crataeva gynandra L., a similar tree, was also recorded by Krebs from St. Thomas, perhaps in cultivation.

Family 4. *MORINGACEAE* Dumort.

HORSERADISH-TREE FAMILY.

Trees with alternate, 2-3-pinnate, deciduous leaves, and perfect, slightly irregular flowers in large axillary panicles. Sepals 5, unequal, imbricated, reflexed or spreading, slightly united at the base. Petals 5, somewhat unequal, the lower one reflexed. Stamens 5, with slender filaments and 1-celled anthers alternating with as many staminodia. Ovary 1-celled, with

3 parietal placentae, bearing numerous pendulous ovules; style slender; stigma minute. Capsule elongated, angled, beaked, 3-valved. Seeds 3-winged or wingless; endosperm none; embryo straight, the cotyledons large. Only the following genus.

1. **MORINGA** Adans. Fam. Pl. 2: 318. 1763.

Characters of the family. [Malabar name.] Three known species, natives of Asia and Africa, the following typical.

1. **Moringa Moringa** (L.) Millsp. Field Mus. Bot. 1: 490. 1902.

Guilandina Moringa L. Sp. Pl. 381. 1753.

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

Moringa pterygosperma Gaertn. Fr. & Sem. 2: 314. 1791.

A tree, up to 9 m. high, the roots with the taste and odor of horseradish, the bark corky, rough, the puberulent twigs slender. Leaves 3-6 dm. long, their segments and leaflets opposite; leaflets numerous, thin, oblong to obovate, 1-2 cm. long, obtuse, entire; flowers numerous, fragrant; pedicels 5-10 mm. long; sepals linear to linear-oblong, 9-13 mm. long, reflexed; petals nearly white, a little larger than the sepals; capsule linear, 3-angled, pendulous, 2-4.5 dm. long, 1-2 cm. thick; seeds winged, 2.5-3 cm. long.

Spontaneous after cultivation in Porto Rico, and widely planted; Vieques; St. Thomas; St. Jan; St. Croix; Virgin Gorda:—Florida; West Indies and continental tropical America. Native of the East Indies. It yields the lubricating oil of ben. **HORSERADISH TREE. BEN. ANGELA. JASMIN FRANCES.**

Order 13. ROSALES.

Herbs, shrubs or trees. Leaves alternate, opposite or whorled, the blades simple or compound. Flowers perfect, occasionally monoecious, dioecious or polygamous, regular or irregular. Calyx of distinct or partially united sepals, or sometimes 2-lipped. Corolla of as many distinct petals as there are sepals, or of partially united petals, or rarely wanting. Stamens as many as the sepals and petals, or twice as many or more, the filaments distinct or partially united. Carpels one or more, distinct or sometimes united into a compound ovary. Fruit various. Seed with or without endosperm.

Flowers regular or nearly so.

Endosperm present, usually copious and fleshy.

Herbs; fruit of 4 follicles.

Shrubs or trees; capsule 2-valved.

Endosperm wanting or scant.

Seed with a fimbriate or rugose aril.

Seed without an aril.

Carpels several or numerous, or if solitary becoming an achene.

Carpel solitary, not becoming an achene.

Ovary with 2 ovules; leaf-blades simple;

fruit a drupe.

Ovary bearing several ovules; leaf-blades

pinnate.

Petals valvate in the bud.

Petals imbricate in the bud.

Flowers irregular.

Fruit a legume; upper petal enclosed by the lateral ones in the bud; leaves compound.

Fruit spiny, indehiscent; leaves mostly simple.

Fruit a legume or loment or indehiscent; upper petals enclosing the lateral ones in the bud; leaves compound, sometimes unifoliate.

Fam. 1. CRASSULACEAE.

Fam. 2. CUNONIACEAE.

Fam. 3. CONNARACEAE.

Fam. 4. ROSACEAE.

Fam. 5. AMYGDALACEAE.

Fam. 6. MIMOSACEAE.

Fam. 7. CAESALPINIACEAE.

Fam. 7. CAESALPINIACEAE.

Fam. 8. KRAMERIACEAE.

Fam. 9. FABACEAE.

Family 1. **CRASSULACEAE** DC.

ORPINE FAMILY.

Herbs, or somewhat shrubby plants, mostly fleshy or succulent, with cymose or rarely solitary regular or symmetrical flowers. Stipules none. Calyx persistent, free from the ovary or ovaries, 4-toothed or 4-parted in our species. Petals or corolla-lobes equal in number to the calyx-lobes or calyx-segments, usually persistent, rarely wanting. Stamens of the same number or twice as many as the petals or corolla-lobes; anthers longitudinally dehiscent. Receptacle with a scale at the base of each carpel. Carpels equal in number to the sepals or calyx-lobes, distinct, or united below; styles subulate or filiform; ovules numerous, arranged in 2 rows along the ventral suture. Follicles 1-celled, dehiscent along the ventral suture. Seeds minute; endosperm fleshy; embryo terete; cotyledons short. About 30 genera and 600 species, of wide geographic distribution.

Calyx inflated, 4-toothed.
Calyx 4-parted.

1. *Bryophyllum*.
2. *Kalanchoe*.

1. **BRYOPHYLLUM** Salisb. Par. Lond. *pl.* 3. 1805.

Upright herbs. Leaves opposite, simple or pinnately compound, the leaflets mostly toothed. Flowers perfect, often showy, nodding, in cymes or panicles opposite the branches. Calyx inflated, 4-toothed. Corolla nearly campanulate, or urn-shaped, the narrow limb with 4 spreading lobes. Stamens 8, in 2 series, adnate to about the middle of the corolla-tube; filaments filiform; anthers mostly exerted. Carpels 4, distinct or partially united. Ovules many. Follicles 4. Seeds numerous. [Greek, sprouting leaf.] Four known species of South Africa, Asia and Madagascar, the following typical.

1. **Bryophyllum pinnatum** (Lam.) Kurz, Jour. Asiat. Soc. Beng. 40²: 52. 1871.

Cotyledon pinnata Lam. Encycl. 2: 141. 1786.

Bryophyllum calycinum Salisb. Par. Lond. *pl.* 3. 1805.

Perennial, fleshy, glabrous. Stems 4–15 dm. tall, branched; leaf-blades often pinnately compound, 1–3 dm. long; leaflets oblong, oval or elliptic, obtuse, crenate, the terminal one several times longer than the lateral ones; panicles 1–4 dm. long, conspicuous; calyx bladder-like, finally oblong-campanulate, 3–3.5 cm. long, glabrous; corolla reddish, twice as long as the calyx or shorter, its lobes lanceolate or narrowly ovate, acute.

Banks and thickets in dry soil, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Anegada.—Florida; Bermuda. West Indies; continental tropical America; Old World tropics. Probably native of Asia. The plant is succulent and highly tenacious of life; buds form in the leaf-margins, and roots develop from small fragments. LIFE PLANT. BRUJA.

2. **KALANCHOË** Adans. Fam. Pl. 2: 248. 1763.

Erect herbs, sometimes a little woody, with opposite leaves and paniced flowers, often showy. Calyx 4-parted, shorter than the corolla. Corolla salverform, with a swollen tube and a spreading, 4-parted limb. Stamens usually 8, in 2 series on the corolla-tube, the filaments very short. Carpels 4, lanceolate, adnate to the base of the corolla-tube; ovules many. Follicles many-seeded. [Chinese name.] Twenty species or more, all but the following natives of Asia and Africa. Type species: *Cotyledon laciniata* L.

1. *Kalanchoe brasiliensis* Camb. in St. Hil. Fl. Bras. Mer. 2: 196. 1829.

Herbaceous, perennial, 3–10 dm. high, glandular-pubescent above. Leaves ovate to obovate, short-petioled, 5–10 cm. long, faintly pinnately veined, crenate-dentate, or the upper pairs lanceolate, much smaller and entire; inflorescence 1–3 dm. long, cymose-paniculate, its branches nearly erect, the bracts very small, flowers yellow, 12–16 mm. long; sepals lanceolate, glandular-pubescent, acute; corolla-tube 2–3 times as long as the calyx, the limb spreading; stamens borne on the corolla-tube a little above the middle, not exerted; follicles about 6 mm. long, the brown seeds oblong.

Spontaneous after cultivation in flower gardens, St. Thomas:—Bermuda; Bahamas; Cuba. Native of Brazil.

Species of the genus *Echeveria*, Mexican, with rosettes of fleshy, ovate to lanceolate leaves, the mostly red flowers racemose or paniced on erect scapes, the corolla 5-angled, are occasionally planted for ornament in Porto Rico and Virgin Island gardens.

Liquidambar styraciflua L., SWEET GUM, of eastern North America, a large tree with star-shaped leaves, the small monoecious flowers capitate, has been experimentally planted for forest purposes in Porto Rico. It is a member of the Family *Hamamelidaceae*. West Indian climates are probably too continuously warm for its successful development.

Family 2. **CUNONIACEAE** R. Br.

CUNONIA FAMILY.

Shrubs or trees. Leaves opposite, or rarely ternate or verticillate, stipulate, simple or compound. Flowers small, mostly perfect, sometimes polygamous or dioecious. Sepals 4 or 5. Petals 4 or 5. Stamens as many as the petals, twice as many, or sometimes more, inserted under the margin of the disk; filaments slender; anthers 2-celled. Carpels usually 2, united into a 2-celled ovary, or distinct; ovules usually numerous and in 2 rows on the placenta. Fruit mostly capsular or follicular. Seeds several or numerous, often winged; embryo small; endosperm present; cotyledons flat or convex. About 20 genera and 125 species, mostly of the southern hemisphere.

1. **WEINMANNIA** L. Syst. ed. 10. 1005. 1759.

Shrubs or trees with opposite, odd-pinnate or rarely simple leaves, the rachis often winged. Stipules deciduous. Inflorescence racemose, terminal or axillary. Flowers small, perfect or polygamo-dioecious. Sepals 4 or 5, imbricate. Petals inserted under the margin of a lobed disk, caducous. Stamens 8 or 10; filaments filiform; anthers small. Ovary superior, 2-celled, rarely 3-celled; styles 2, rarely 3, subulate, persistent, with simple stigmas. Ovules several or numerous, biseriate. Capsule small, 2-celled, septicidally 2-valved, few-seeded to many-seeded. Seeds oblong or reniform, the testa thin; embryo terete. [Dedicated to Johann Wilhelm Weinmann, druggist at Regensburg, died 1734.] About 75 species, natives of the West Indies, tropical and temperate South America, Australia, New Zealand, Malaya, Madagascar and Polynesia.

1. *Weinmannia pinnata* L. Syst. ed. 10. 1005. 1759.

Weinmannia hirta Sw. Prodr. 63. 1788.

Windmannia pinnata Kuntze, Rev. Gen. Pl. 228. 1891.

A shrub 2-4 m. high, or a tree sometimes 15 m. tall, the trunk up to 3 dm. in diameter. Leaves pinnate, short-petioled; leaflets 5-25, usually 9-17, oblong to ovate or somewhat obovate, sessile, obtuse at the apex, narrowed at the base, serrate, 6-25 mm. long, 4-12 mm. broad, glabrous above, pubescent on the veins beneath or sometimes glabrous on both sides; rachis narrowly or broadly winged; racemes usually longer than the leaves, many-flowered; pedicels filiform, 2-4 times as long as the calyx, appressed-pubescent; sepals ovate to ovate-lanceolate, acute, pubescent or glabrate, about 1 mm. long; petals obovate to oblong-obovate, 1-nerved; capsule ovoid, glabrous; seeds about 1 mm. long, pilose.

Mountain forests at high elevations, Porto Rico;—Cuba; Jamaica; Hispaniola; St. Kitts to St. Vincent; Mexico to Brazil. OREGANILLO.

Brexia madagascariensis Thouars, Madagascan, a small tree with stiff coriaceous large, linear to lanceolate, spiny-toothed or entire leaves and large greenish flowers in axillary clusters, has been grown at the Agricultural Station, Roadtown, Tortola. It is classified in the related family **Escalloniaceae**.

Family 3. **CONNARACEAE** R. Br.

CONNARUS FAMILY.

Trees, shrubs or vines, with alternate estipulate mostly odd-pinnate leaves. Flowers usually perfect, regular, racemose or paniculate. Calyx 5-lobed or 5-parted, often persistent at the base of the fruit. Petals 6, usually distinct. Stamens 5 or 10, those opposite the petals shorter; filaments often united at the base; anthers small, didymous. Carpels 5, distinct, 1-celled; ovules 2. Fruit a leathery or woody, 1-seeded rarely 2-seeded follicle, ventrally dehiscent. Seed erect; cotyledons foliaceous; endosperm fleshy or none. About 40 genera and 140 species of wide distribution.

1. **ROUREA** Aubl. Pl. Guian. 1: 467. 1775.

Woody vines, shrubs, or small trees. Leaves odd-pinnate, rarely unifoliate, evergreen. Twigs often terminating in a stout hook or coil. Flowers small, in axillary or terminal panicles. Calyx 5-lobed, enlarged and persistent in fruit. Petals 5. Stamens 10. Carpels 5, usually 1 only maturing, the others imperfect. Follicle sessile, 1-seeded; seed erect; endosperm none. [Named from Roura, a town of French Guiana.] About 40 species, natives of tropical America and Asia, one African. Type species: *Rourea frutescens* Aubl.

1. **Rourea surinamensis** Miq. Linnaea 26: 221. 1853.

Rourea glabra Griseb. Fl. Br. W. I. 228, in part, 1860. Not H. B. K. 1824.

A woody vine, 2-4 m. long or longer. Leaves long-petioled, glabrous; leaflets 3-5, oblong to ovate-elliptic, 3-12 cm. long, 2.3-7.5 cm. broad, shining above, dull beneath, acute or acuminate at the apex, rounded at the base; petiolules 2-6 mm. long; panicles 6-10 cm. long, shorter than the leaves; pedicels filiform, 2-8 mm. long; calyx about 3 mm. long, its lobes ovate to oval, ciliolate; petals obovate, white; stamens a little shorter than the petals; carpels villous; follicles obliquely short-cylindric, 1-1.7 cm. long, 4-6 mm. in diameter; seed dark-brown.

Forests in moist or wet districts, Porto Rico, ascending to higher elevations;—Cuba; Jamaica; Hispaniola; St. Lucia; Grenada; South America. Recorded by Bello and by Cook and Collins as *Rourea frutescens*. BEJUCO DE GARROTE. JUAN CALIENTE.

Family 4. **ROSACEAE** B. Juss.

ROSE FAMILY.

Herbs, shrubs, or trees, with alternate (in some exotic genera opposite) leaves, and regular perfect or rarely polygamo-dioecious flowers. Stipules commonly present, sometimes large. Calyx free from or adnate to the ovary, 5-lobed (rarely 4-9-lobed), often bracteolate. Disk adnate to the base of the calyx. Petals equal in number to the calyx lobes, distinct, or none. Stamens usually numerous, distinct; anthers small, 2-celled. Carpels 1- ∞ , distinct, or adnate to the calyx. Ovary 1-celled or rarely imperfectly 2-celled; style terminal or lateral. Ovules 1, 2, or several, anatropous. Fruit mostly follicles or achenes; endosperm none, or rarely copious. About 75 genera and over 1200 species, of wide geographic distribution.

Fruit of aggregate drupelets.
Achenes enclosed in the ripened calyx-tube.

1. *Rubus*.
2. *Rosa*.

1. **RUBUS** (Tourn.) L. Sp. Pl. 492. 1753.

Perennial herbs, shrubs or trailing vines, often prickly, with alternate simple lobed or 3-7-foliolate leaves, the stipules adnate to the petiole. Flowers terminal or axillary, solitary, racemose or paniced, white, pink or purple, perfect or sometimes dioecious. Calyx persistent, not bracted, deeply 5-parted, its tube short and broad. Petals 5, deciduous. Stamens numerous, inserted on the calyx, distinct. Carpels ∞ , rarely few, inserted on a convex or elongated receptacle, ripening into drupelets and forming an aggregate fruit. Ovules 2, one abortive. Style nearly terminal, slender. Seed pendulous. [The ancient name of the bramble, from *ruber*, red.] About 250 species, of wide geographic distribution, most abundant in the north temperate zone. Type species: *Rubus fruticosus* L.

Drupelets falling from the dry receptacle; lateral leaflets 1-3.2 cm. broad.

Drupelets coherent with the receptacle; lateral leaflets 3.8-6 cm. broad.

1. *R. rosaefolius*.
2. *R. florulentus*.

1. **Rubus rosaefolius** Smith, Pl. Ic. Ined. pl. 60. 1791.

Rubus rosaefolius coronarius Sims, Bot. Mag. pl. 1783. 1816.

Stems perennial, nearly terete, erect, about 1 m. high or less, often with recurved branches, pilose or glabrate, armed with small straight or recurved prickles. Leaves pinnately 3-15-foliolate; stipules filiform or subulate; petioles and rachis pilose, often armed with small prickles; lateral leaflets sessile or very short-petioluled, lanceolate to ovate, 2-7 cm. long, 1-3.2 cm. broad, doubly-serrate, sparingly pilose on both sides or glabrate, the terminal leaflet larger, long-petioluled; flowers solitary or in few-flowered cymes, terminal, often double; pedicels pilose; sepals lanceolate, long-acuminate; petals white, obovate, 1-2 cm. long; fruit thimble-shaped, 2-3.5 cm. long, bright red or orange, drupelets sometimes glandular.

Mountain slopes at middle elevation in moist districts of Porto Rico;—Cuba, Hispaniola; St. Kitts; Guadeloupe; Dominica; Martinique; St. Vincent. Native of southeastern Asia. Locally very abundant in Porto Rico, and its fruit collected and sold in large quantities; occasionally cultivated. MOUNTAIN RASPBERRY. ZARZA. ROSA MINADORA. ROSA DE NOVIA. FRESAS.

2. **Rubus florulentus** Focke, Abh. Nat. Ver. Bremen 11: 411. 1890.

Stems perennial, angled, climbing, sometimes 10 m. long, more or less pubescent, often rather sparingly armed with recurved prickles. Leaves ternate; stipules linear-lanceolate; petioles and petiolules puberulent or glabrous, often

armed with recurved prickles; lateral leaflets coriaceous, ovate to oval, 4-8 cm. long, 3.8-6 cm. broad, finely serrate, glabrous and lustrous above, dull, glabrate or hirsute at least on the veins beneath, acute or short-acuminate at the apex, cordate or subcordate at the base, their petiolules 3-6 mm. long; terminal leaflet somewhat longer and broader, long-petioluled; panicles many-flowered, the branches tomentose, armed with rather stout recurved prickles; pedicels often with 2 or 3 bracts; sepals ovate, 6-7.5 mm. long, reflexed, tomentose; petals white obovate, nearly twice as long as the sepals; drupelets glabrous.

Mountain forests near Maricao and Adjuntas. Endemic.

Rubus probus Bailey, planted at the Insular Experiment Station, Rio Piedras, studied there in 1924, resembles *R. rosaefolius* but is taller and has larger leaflets, and the scarlet fruit is depressed-globose, often twice as broad as high; it is supposed to be of hybrid origin.

Rubus trivialis Michx., LOW BUSH BLACKBERRY, North American, experimentally planted at the Insular Agricultural Experiment Station in 1923, is a prostrate prickly plant, up to 2 dm. long, with glabrous ovate to oblanceolate leaflets and black fruit 1-1.5 cm. long.

Rubus glaucus Benth., of the northern Andes of South America, also introduced at the Rio Piedras Station, is a glabrous and somewhat glaucous shrub 2-3 m. high, the obtuse leaflets green above, whitish-tomentose beneath, the dark purple fruit up to 2 cm. long.

Rubus ellipticus Smith, Asiatic, introduced at the Rio Piedras Station from Jamaica, where it is naturalized in the mountains, is an erect prickly shrub becoming about 5 m. high, the stems hispid with reddish hairs, the coriaceous leaflets dark green above, white-tomentose beneath, the hemispheric fruit yellow.

Rubus argutus Link, North American, also grown at the Rio Piedras Station, is a very prickly plant, the branches up to about 1 m. long, the 3 or 5 ovate or oblong, acuminate leaflets coarsely serrate.

2. **ROSA** [Tourne.] L. Sp. Pl. 491. 1753.

Erect or climbing shrubs, generally with subterranean rootstocks. Stems commonly prickly. Leaves alternate, odd-pinnate. Stipules adnate to the petiole. Flowers corymbose or solitary, red, pink, or white (in our species). Calyx-tube cup-shaped or urn-shaped, constricted at the throat, becoming fleshy in fruit, 5- (rarely 4-) lobed, the lobes imbricated, deciduous or persistent. Petals 5, (rarely 4), spreading. Stamens ∞ , inserted on the hollow annular disk. Carpels ∞ , sessile at the bottom of the calyx; ovaries commonly pubescent; styles distinct or united. Achenes numerous, enclosed in the berry-like fruiting calyx-tube. Seed pendulous. [The ancient Latin name of the rose.] A large genus, natives of the northern hemisphere. Type species: *Rosa cinnamomea* L.

Styles connate; stems climbing.
Styles distinct; stems erect.

1. *R. sempervirens*.
2. *R. indica*.

1. **Rosa sempervirens** L. Sp. Pl. 492. 1753.

Stems climbing, armed with scattered, curved prickles. Leaflets 3-7, elliptic to oval or ovate, acute or acuminate at the apex, usually rounded at the base, appressed-serrate, glabrous on both sides, or rarely pubescent on the veins beneath; flowers corymbose or sometimes solitary; pedicels glandular-hispid; hypanthium ellipsoid or subglobose, glandular-hispid; sepals ovate,

abruptly acuminate, petals glandular-hispid on the back, reflexed and deciduous, white; styles united, usually villous.

Locally subspontaneous after cultivation at middle elevations in Porto Rico. Native of southern Europe and northern Africa. Planted for ornament in Porto Rico and the Virgin Islands. *ROSA DE ITALIA*.

2. *Rosa indica* L. Sp. Pl. 492. 1753.

Stems erect, terete, armed with stout, flat, straight or somewhat curved prickles. Leaflets 3-5, rarely 7, ovate, acuminate at the apex, usually rounded at the base, finely serrate, dark-green and lustrous above, paler beneath, glabrous; flowers few, corymbose or solitary; pedicels glabrous or slightly glandular; hypanthium pear-shaped, acute at the base, glabrous; sepals lanceolate, caudate-acuminate; petals crimson, pink or white, styles exserted, distinct.

Locally subspontaneous after cultivation in Porto Rico:—Cuba; Jamaica; Mexico. Native of southeastern Asia. *ROSA VERDE*.

Rosa damascena Mill., DAMASK ROSE, Asiatic, occasionally planted for ornament in the Virgin Islands, but scarcely persistent, is a bushy, prickly rose, the somewhat pubescent leaves with 5 or 7 leaflets, the usually numerous and double flowers white or pink.

*
Rosa semperflorens Curtis, Chinese, recorded by Krebs as formerly grown in St. Thomas, is also a bushy rose, but often unarmed, the glabrous leaves with 3 or 5 shining leaflets, the crimson or pink flowers solitary or few together.

Many kinds of garden roses, especially hybrid teas, are grown in Porto Rico and the Virgin Islands; among the more successful mention may be made of Madam Eugene Marlitt, Etoile de Lyon, Souvenir de la Malmaison, Maris Van Houtte, Marechal Niel, Alexander Hill Gray and La France.

Various Polyantha and Baby Rambler Roses blossom freely at higher elevations in Porto Rico, but the long ramblers do not succeed.

A plant of the Green Rose (*Rosa chinensis viridiflora* Dipp., in which all the numerous petals are transformed into small narrow green leaves, was seen in the garden of Mrs. William McKinley, near Santuree, Porto Rico, in 1924.

Fragaria chiloensis Duchesne, STRAWBERRY, has been grown for its fruit in Porto Rico; an interesting experimental plantation was established at the Rio Piedras Agricultural Experiment Station in 1923-1924.

Malus Malus (L.) Britton [*Pyrus Malus* L.; *Malus communis* Poir.], APPLE, MANZANA, has been grown for its fruit at middle altitudes in Porto Rico, but the tree is not long-lived in the West Indies.

Eriobotrya japonica (Thunb.) Lindl., LOQUAT, JAPANESE MEDLAR, Japanese, has been experimentally planted in Porto Rico, but while growing to a height of 3 m. or more, it has not proved successful as a crop. It is a small tree, with oblong serrate leaves 10-20 cm. long, brownish woolly beneath; its white flowers are in dense woolly terminal panicles; the fruit is a yellow acid pome 3-4 cm. long [*Mespilus japonica* Thunb.].

Hydrangea hortensis Smith, Asiatic, of the related family **Hydrangeaceae** occasionally grown for ornament in Porto Rico and the Virgin Islands, is not persistent.

Family 5. **AMYGDALACEAE** Rehb.

PLUM FAMILY.

Trees or shrubs, the bark exuding gum, the foliage, bark and seeds often containing prussic acid, bitter. Leaves alternate, petioled, serrate, the small stipules early deciduous, the teeth and petiole often glandular. Flowers regular, mostly perfect. Calyx deciduous, free from the ovary, 5-lobed. Disk annular. Petals 5, inserted on the calyx. Stamens numerous, inserted with the petals. Pistil 1 in our genera; ovary 1-celled, 2-ovuled; style simple; stigma mostly small and capitate. Fruit a drupe. Seed 1, suspended; endosperm none; cotyledons fleshy. About 10 genera and 120 species, widely distributed, mostly abundant in the north temperate zone.

Style terminal.

Style basal or lateral.

Stamens 15 or more, short, in a complete circle.

Stamens 3-8, long-exserted; unilateral.

1. *Laurocerasus*.

2. *Chrysobalanus*.

3. *Hirtella*.

1. **LAUROCERASUS** Roem. Syn. Mon. 3: 89. 1847.

Evergreen trees or shrubs, with coriaceous or subcoriaceous leaves and small white flowers in axillary racemes. Calyx 5-lobed, the lobes deciduous. Petals 5, white, deciduous. Stamens 15-30, the filaments slender. Ovary sessile; ovules pendulous; style terminal. Drupe subglobose or ellipsoid, 1-seeded, the flesh thin, not pulpy. [Laurel-cherry.] About 20 species, of temperate and tropical regions. Type species: *Prunus Laurocerasus* L.

Flowers 5 mm. broad; fruit subglobose, 9-13 mm. in diameter.

Flowers 7 mm. broad; fruit ellipsoid, 2-2.5 cm. long.

1. *L. myrtifolia*.

2. *L. occidentalis*.

1. **Laurocerasus myrtifolia** (L.) Britton, N. A. Trees, 510. 1908.

Celastrus myrtifolius L. Sp. Pl. 196. 1753.

Prunus sphaerocarpa Sw. Prodr. 80. 1788.

Cerasus sphaerocarpa Loisel. in Nouv. Duham. Arb. ed. nov. 5: 4. 1812.

Prunus myrtifolia Urban, Symb. Ant. 5: 93. 1904.

A tree attaining a maximum height of about 12 m. with a trunk up to 4 dm. thick, the nearly smooth bark reddish brown. Leaves subcoriaceous, elliptic or elliptic-ovate, 5-11 cm. long, 2.5-4.8 cm. broad, acute, bluntish, or acuminate at the apex, narrowed or obtuse at the base, glabrous, shining above, dull beneath, entire-margined, the petioles about 1 cm. long; racemes mostly shorter than the leaves, rather densely flowered; pedicels 4-7 mm. long; calyx-lobes toothed; petals broadly obovate, about 2.5 mm. long; drupes globose, 9-13 mm. in diameter, orange-brown.

Forest, Monte Alegre, near Maricao, collected by Sintenis (according to Urban):—Florida; Bahamas; Jamaica; Cuba; Hispaniola. Also recorded from Mexico and Brazil.

2. **Laurocerasus occidentalis** (Sw.) Roem. Syn. Mon. 3: 89. 1847.

Prunus occidentalis Sw. Prodr. 80. 1788.

Cerasus occidentalis Loisel. in Nouv. Duham. Arb. ed. nov. 5: 4. 1812.

A tree sometimes 18 m. high. Leaves subcoriaceous, oblong-elliptic or elliptic, 9-20 cm. long, 4-7.5 cm. broad, acuminate at the apex, rounded or acute at the base, glabrous; racemes shorter than the leaves, 3-9 cm. long, densely flowered; pedicels 5-9 mm. long; calyx lobes triangular; petals obovate, about 3 mm. long; drupes ellipsoid 2-2.5 cm. long, 1.5 cm. or more thick.

Forests in moist districts, Porto Rico:—Cuba; Jamaica; Hispaniola; St. Kitts to St. Vincent. Also recorded from Guatemala and Panama. The light brown wood is hard, heavy, its specific gravity nearly 1.00; it is valued for cabinet work. ALMENDRILLO.

2. **CHRYSOBALANUS** L. Sp. Pl. 513. 1753.

Small trees or shrubs, with coriaceous, entire or undulate-margined leaves, and small, white or greenish, perfect flowers in terminal or axillary cymes or panicles. Calyx with a campanulate or turbinate tube and a 5-lobed limb, the lobes imbricated, nearly equal. Petals 5, deciduous. Stamens numerous, with slender filaments. Ovary sessile, 1-celled; ovules 2, erect; style filiform, basal or lateral. Drupe pulpy, with a hard 5-6 ridged stone. [Greek, golden date.] About 3 species, 2 of them American, the other African. Type species: *Chrysobalanus Icaco* L.

Fruit oval or globose; petals cuneate.
Fruit obovoid; petals spatulate.

1. *C. Icaco*.
2. *C. pellocarpus*.

1. **Chrysobalanus Icaco** L. Sp. Pl. 513. 1753.

An evergreen tree or shrub, attaining a maximum height of about 10 m., with a trunk sometimes 3 dm. in diameter, the thin bark brownish, the twigs glabrous or nearly so, reddish brown. Leaves elliptic to obovate or nearly orbicular, 4-8 cm. long, glabrous, rounded, obtuse or emarginate at the apex, narrowed at the base, dark green and shining above, dull beneath, the petioles short, stout; cymes peduncled, several-many-flowered, shorter than the leaves; calyx pubescent, its lobes triangular-ovate, acute, about 2.5 mm. long; petals white, cuneate, twice as long as the calyx-lobes; drupes various, globose or oval, pink, white or purple, 2-4 cm. long.

Thickets and hillsides, mostly at lower elevations near the coasts, Porto Rico; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; West Indies; Mexico to northern South America. Also recorded from tropical Africa. The fruit is used for preserves and dulces; the seeds are edible and yield an oil; the leaves and bark are astringent; the wood is light brown, hard and heavy, with a specific gravity of about 0.77. COCO-PLUM. HICACO. ICACO.

2. **Chrysobalanus pellocarpus** G. F. W. Meyer, Prim. Fl. Esseq. 193. 1818.

Chrysobalanus Icaco pellocarpus DC. Prodr. 2: 525. 1825.

Similar to the preceding species, but not attaining as large size, usually a shrub 2 m. high or less, sometimes a small tree. Leaves usually smaller, 6 cm. long or less, rounded or abruptly acute at the apex; cymes shorter than the leaves; petals spatulate; drupe mostly obovoid, or oblong-obovoid, 1.5-2 cm. long, purple to black.

Hillsides in moist districts, Porto Rico;—Florida; Bahamas; Cuba; Hispaniola; Guadeloupe; northern South America. Probably a race of the preceding species.

3. **HIRTELLA** L. Sp. Pl. 34. 1753.

Shrubs or trees with simple alternate entire leaves and small flowers in axillary and terminal panicles or racemes. Stipules caducous. Calyx-lobes 5, reflexed. Petals 5, deciduous. Stamens 3-10, or more, the perfect stamens on one side only of the receptacle, the staminodes on the other side; filaments united at the base, long exerted. Ovary 1-celled, inserted on one side of the receptacle; ovules 2; style nearly basal. Fruit drupaceous, dry. Seed erect; cotyledons fleshy; radicle inferior. [Latin, hairy, referring to the hairy twigs.] About 40 species, natives of tropical America, one in Madagascar. Type species: *Hirtella americana* L.

Leaves lanceolate to elliptic, acute or rounded at the base; pubescence appressed.
Leaves ovate, subcordate at the base; pubescence spreading.

1. *H. triandra*.
2. *H. rugosa*.

1. *Hirtella triandra* Sw. Prodr. 51. 1788.

Hirtella americana Jacq. Sel. Amer. 8. 1763. Not L. 1753.

A shrub 3-4 m. high, or a tree up to 15 m. or more, the slender young twig strigose. Leaves lanceolate to elliptic, rarely somewhat elliptic-obovate, 5-15 cm. long, 2.5-5.8 cm. broad, long-acuminate at the apex, acute or rounded at the base, the midvein hirsute-strigose; petioles 2-4 mm. long, hirsute-strigose; inflorescence usually 3.5 cm. or more long; sepals ovate to oval, about 3 mm. long, velvety-pubescent within, strigose-pubescent on the back; petals oval or broadly obovate, 4.6-5 mm. long, 3 mm. broad; filaments pink; fruit oblong-obovoid, 2-2.5 cm. long, 6-9 mm. broad, more or less hirsute.

Forests and hillsides and river-banks in wet or moist districts, Porto Rico, ascending to the higher elevations:—Jamaica: Cuba; Hispaniola; St. Kitts to Trinidad; Panama; northern South America. The light brown wood is hard, tough and heavy. TETA DE BURRA.

2. *Hirtella rugosa* Pers. Syn. 1: 250. 1805.

Hirtella portoricensis H. & B.; R. & S. Syst. 5: 274. 1819.

A small tree, up to 6 m. high, with long-hirsute drooping branches. Leaves lanceolate-ovate to broadly ovate, 3-9 cm. long, 1.6-4.6 cm. broad, acuminate at the apex, rounded and usually subcordate at the base, lustrous, reticulate-veined and often long-hirsute on the midvein above, long-hirsute on the veins beneath, the margin often ciliate; calyx-lobes elliptic to oval or somewhat ovate, 3.5-4 mm. long, densely appressed-puberulent within, densely puberulent on the back with long hairs intermixed; petals red, elliptic to elliptic-obovate, 5.5-6 mm. long, 3-3.5 mm. broad, rose-pink or red; fruit about 1.5 cm. long, red.

Mountain forests at middle and higher elevations, Porto Rico. Endemic. ICACILLO. TETA DE BURRA CIMARRON.

Family 6. **MIMOSACEAE** Rehb.

MIMOSA FAMILY.

Herbs, shrubs or trees, with alternate, commonly 2-3-pinnate leaves the stipules various, and small regular mostly perfect flowers in heads, spikes or racemes. Calyx 3-6-toothed or 3-6-lobed, the teeth or lobes mostly valvate in the bud. Corolla of as many distinct or united petals, also valvate. Stamens distinct, or monadelphous. Ovary 1-celled; style simple. Fruit a legume. Seeds without endosperm; cotyledons fleshy. About 40 genera and 1500 species, mostly tropical.

Filaments united below into a tube.

Leaves simply and abruptly pinnate.

Leaves bipinnate, the pinnae sometimes with only one pair of leaflets.

Pod curved or coiled, the valves twisted after dehiscence.

Pod straight, flat.

Valves of the pod coriaceous.

Valves not elastically dehiscent.

Valves elastically dehiscent from the apex and revolute.

Valves thin or papery.

Filaments distinct, or connate only at the base.

Stamens numerous, more than twice as many as the petals or corolla-lobes.

Ovary sessile; pods nearly terete, pulpy within.

Ovary stipitate; pods mostly thin, dry and flat.

Stamens as many or twice as many as the petals or corolla-lobes, distinct.

Anthers not glanduliferous.

Valves of the pod not separating from their margins.

Pod broadly linear, the seeds transversely placed.

Pod narrowly linear, the seeds longitudinally or obliquely placed.

1. *Inga*.

2. *Pithecellobium*.

3. *Samanea*.

4. *Anneslia*.

5. *Albizia*.

6. *Vachellia*.

7. *Acacia*.

8. *Leucacna*.

9. *Acuan*.

- Valves of the pod separating from their margins.
 Pod little flattened, subtetragonal, beaked.
 Pod flat, not beaked.
 Anthers glanduliferous, at least in the bud.
 Seeds with endosperm.
 Flowers capitate; herbs.
 Flowers spicate or racemose; trees or shrubs.
 Pod compressed, 2-valved.
 Pod thick, indehiscent.
 Seeds without endosperm.
 Trees or shrubs.
 High-climbing woody vines.
10. *Morongia*.
 11. *Mimosa*.
 12. *Neptunia*.
 13. *Adenanthera*.
 14. *Prosopis*.
 15. *Piptadenia*.
 16. *Entada*.

1. **INGA** [Plum.] Scop. *Introd.* 298. 1777.

Unarmed trees or shrubs with evenly pinnate leaves, the flowers spicate, capitate or racemose, usually perfect. Calyx tubular or campanulate, 5-toothed; corolla tubular or funnelform, the petals being united to the middle or beyond the middle. Stamens numerous, long-exserted; filaments united below into a tube; anthers very small; pollen-grains agglomerate. Ovary sessile; ovules numerous; style slender; stigma terminal. Pod linear, flat or 4-angled, or 4-ribbed, coriaceous, mostly indehiscent, usually pulpy within. [Aboriginal name.] About 150 species, natives of tropical America. Type species: *Mimosa Inga* L.

Pubescent; leaf-rachis winged; pod 4-costate.
 Glabrous; leaf-rachis wingless; pod flat.

1. *I. Inga*.
 2. *I. laurina*.

1. **Inga Inga** (L.) Britton, *Fl. Bermuda* 170. 1918.

Mimosa Inga L. *Sp. Pl.* 516. 1753.
Inga vera Willd. *Sp. Pl.* 4: 1010. 1806.

A tree, 15 m. high or higher, with pubescent twigs, the trunk up to 1 m. in diameter, the bark slightly fissured when old. Leaves 2-3 dm. long, the pubescent petioles 1-2.5 cm. long, the rachis winged between the leaflets; leaflets 3-5 pairs, oblong to elliptic, sessile, pubescent, 10 cm. long or less, acute or acuminate, darker green above than beneath; flowers few, sessile or nearly so, in short, peduncled spikes; peduncles pubescent, 1.5-6 cm. long; calyx tomentulose, about 1 cm. long, its teeth triangular-ovate, acute; corolla densely sericeous, somewhat longer than the calyx, its lobes acute; stamens white, long-exserted, 3-4 times as long as the corolla; pod tomentose, 4-costate, falcate, 1-1.5 dm. long.

Woodlands, hillsides and along streams at lower and middle altitudes, in moist or wet districts, and extensively planted for coffee-shade, Porto Rico;—Jamaica; Cuba; Hispaniola; continental tropical America from Mexico to Venezuela; its wood is light gray, hard, strong and rather heavy. GUABA.

2. **Inga laurina** (Sw.) Willd. *Sp. Pl.* 4: 1018. 1806.

Mimosa laurina Sw. *Prodr.* 85. 1788.
Fenillea laurina Kuntze, *Rev. Gen. Pl.* 184. 1891.

A tree, 15 m. high or more, glabrous throughout, the brown bark smooth. Leaves 1-2.5 dm. long, the petioles 1-2 cm. long; leaflets mostly 2 pairs, sometimes a single pair, firm in texture, oblong or elliptic, bluntly pointed or acute, sessile, 5-10 cm. long, shining above; spikes many-flowered, peduncled, 7-15 cm. long; flowers very nearly sessile; calyx only about 2 mm. long, its teeth short and broad; corolla white, about 6 mm. long, its lobes triangular-lanceolate, acute; stamens white, about 4 times as long as the corolla; pod linear, flat, 5-12 cm. long, about 2 cm. wide, with raised margins, transversely striate. [*Mimosa nodosa* of Sessé & Mocino, not of Linnaeus.]

Woodlands, hillsides and along streams at lower and middle elevations, mostly in moist districts; and extensively planted for coffee-shade, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Hispaniola; St. Kitts to Grenada. Also much planted for coffee-shade. The dark gray wood is hard, a little heavier than that of the preceding species. GUAMA. POMSROCK. SWEET PEA.

Inga edulis Mart., of tropical America, experimentally planted at the Mayaguez Agricultural Experiment Station, has tomentose leaves with 4 to 6 pairs of oblong acuminate leaflets, and usually with a winged petiole, the flowers spicate, the long pods subterete.

Inga fastuosa Willd., Venezuelan, also planted at the Mayaguez Station, is a tree, with reddish hispid twigs, the leaves with 4 or 5 pairs of ovate shining acute leaflets and a winged petiole, the flowers spicate, the villous pod up to 3 dm. long and 7 cm. wide.

Inga heterophylla Willd., listed by Krebs as found in St. Thomas, is a species of Trinidad and northern South America, certainly not native in the Virgin Islands.

2. **PITHECELLOBIUM** Mart. Hort. Monac. 188. 1829.

Shrubs or trees, often with spinescent stipules, the leaves bipinnate with few or many leaflets, the flowers in clustered or solitary heads or spikes. Calyx 5-toothed. Corolla tubular to funnelform, the petals being united to above the middle. Stamens long-exserted; filaments united below into a tube; anthers very small; pollen-grains agglomerate. Ovary many-ovuled; style filiform. Pod compressed or subterete, curved or coiled, the valves twisting after dehiscence. Seeds often with a fleshy aril. [Greek, monkey's-earring, referring to the contorted pods.] Twenty species or more, mostly tropical American. Type species: *Pithecellobium Unguis-cati* (L.) Mart. The generic name has been written *Pithecolobium* by subsequent authors.

Leaflets a single pair on each pinna; stipules spinescent; foliage glabrous.
Leaflets very numerous; stipules not spinescent; twigs and petioles pubescent.

1. *P. Unguis-cati*.
2. *P. arboreum*.

1. **Pithecellobium Unguis-cati** (L.) Mart. Hort. Monac. 188. 1829.

Mimosa Unguis-cati L. Sp. Pl. 517. 1753.

Inga Unguis-cati Willd. Sp. Pl. 4: 1006. 1806.

Fevillea Unguis-cati Kuntze, Rev. Gen. Pl. 144. 1891.

A shrub up to 6 m. high, rarely a small tree 8 m. high, usually armed with spinescent stipules 2 cm. long or less, the foliage glabrous. Petiole 5–20 mm. long; pinnae 2, each with one pair of obliquely obovate or oblong, obtuse, leaflets 1–5 cm. long; heads slender-peduncled, in terminal racemes; flowers sessile; calyx about 2 mm. long; corolla 5–6 mm. long; stamens 10–15 mm. long, yellowish or pinkish; pod coiled or curved, compressed, somewhat constricted between the seeds, 5–10 cm. long, about 7 mm. wide; seeds nearly black, shining, 4–6 mm. broad.

Coastal thickets, and on hillsides near the southern coast, extending up the valley of the Coamo River, Porto Rico; Vieques; Culebra; Desecheo; Mona; Icacos; St. Croix; St. Thomas; St. Jan; Virgin Gorda; Anegada;—West Indies; Florida; northern South America. UÑA DE GATO. ROLON. CRAB PRICKLE. BLACK BEAD. CAT'S-CLAW.

2. **Pithecellobium arboreum** (L.) Urban, Symb. Ant. 2: 259. 1900.

Mimosa arborea L. Sp. Pl. 510. 1753.

? *Mimosa filicifolia* Lam. Encycl. 1: 13. 1783.

Acacia arborea Willd. Sp. Pl. 4: 1064. 1805.

Pithecolobium filicifolium Benth. in Hook. Lond. Journ. Bot. 3: 205. 1844.

An unarmed tree up to 20 m. high, the twigs, petioles and leaf-rachises pubescent, the bark gray and smooth. Leaves bipinnate, 1.5–3 dm. long; pinnae 8–16 pairs, a small circular gland on the rachis between each pair; leaflets 20–40

pairs, obliquely oblong or oblong-lanceolate, glabrous or nearly so, 8–12 mm. long, 1.5–2 mm. wide, obtuse or acutish; peduncles clustered or solitary, pubescent, slender, 5–10 cm. long, axillary or at old internodes; heads globose, many-flowered; flowers sessile; calyx about 2 mm. long, glabrous, its teeth short and broad; corolla 6–8 mm. long; stamens 12–16 mm. long, whitish; pod curved or coiled, rather fleshy, constricted between the seeds, 5'–15' long, crimson within, puberulent when young, glabrous when old; seeds black, without a fleshy aril. [*Acacia Berteriana* of Bello and of Cook and Collins, not of Balbis.]

Woodlands and river banks at lower and middle altitudes, Porto Rico, mostly in moist districts:—Hispaniola; Cuba; Jamaica; Mexico and Central America. COJOBA. COJOBANA. ACACIA SYLVESTRE.

Pithecellobium dulce (Roxb.) Benth., of Central America, a tree, usually unarmed, with slender glabrous branches, the glabrous leaves with 2 or 4 oblong leaflets, the white globose heads of flowers paniced, has occasionally been planted in Porto Rico, and seedlings were seen at the St. Croix Agricultural Experiment Station in 1923. [*Mimosa dulcis* Roxb.]

Pithecellobium platylobum (Spreng.) Urban, a tree of northern South America and islands adjacent, listed by Krebs as found in St. Thomas prior to 1851, may, perhaps, have been planted there. [*Acacia platyloba* Spreng.]

Pithecellobium parvifolium (Willd.) Benth., endemic in Jamaica, was listed by Krebs from St. Thomas, evidently in error. [*Acacia parvifolia* Willd.]

3. SAMANEA Merrill, Journ. Wash. Acad. 6: 46. 1916.

Mostly unarmed trees or shrubs with bipinnate leaves and capitate or umbellate flowers. Calyx tubular to campanulate, 5-toothed. Corolla 5-toothed or 5-lobed, the petals being united to beyond the middle. Stamens many, long-exserted; filaments united below into a tube; anthers very small. Ovary several-many-ovuled; style slender, or filiform. Pod flat or compressed, mostly straight, the valves coriaceous or fleshy, not twisting after dehiscence, sometimes very tardily dehiscent. [From the South American name of the following typical species.] Perhaps 25 species, nearly all of tropical America.

1. **Samanea Saman** (Willd.) Merrill, Journ. Wash. Acad. 6: 47. 1916.

Mimosa Saman Jacq. Fragm. 15. 1809.

Inga Saman Willd. Sp. Pl. 4: 1024. 1806.

Inga cinerea H. & B.; Willd. Sp. Pl. 4: 1024. 1806.

Calliandra Saman Griseb. Fl. Br. W. I. 225. 1860.

Pithecolobium Saman Benth. In Hook. Journ. Bot. 3: 216. 1844.

Enterolobium Saman Praln, Journ. Asiat. Soc. Bengal, 66: 252. 1897.

A tree up to 20 m. high, or higher, with widely spreading branches, the twigs and leaves finely pubescent, the old bark grey, separating in strips, the leaves often 4 dm. long. Pinnæ 2–6 pairs, a small circular gland on the rachis between each pair; pinnules 2–8 pairs, obliquely oblong to obovate, 2–4 cm. long, pubescent beneath, becoming glabrous above, obtuse, finely reticulate-veined; umbels many-flowered; peduncles pubescent, 6–12 cm. long; pedicels 2–5 mm. long; calyx pubescent, 6 mm. long; corolla silky-villous, 10–12 mm. long; stamens 4–5 cm. long, pinkish, united toward the base; pod straight or a little curved, compressed, 10–20 cm. long, 10–18 mm. wide, about 6 mm. thick, very tardily dehiscent, pulpy within, the valves somewhat fleshy; seeds oblong, dull, 5–8 mm. long.

Roadsides and hillsides, Porto Rico, naturalized from continental tropical America; St. Thomas; St. Croix. Widely naturalized in the West Indies. Planted for shade; its pods furnish food for cattle; the reddish wood is hard and heavy, but not very durable. SAMAN. RAIN-TREE. GIANT THIBET. GUANGO. COW-BEAN TREE.

4. **ANNESLIA** Salisb. Parad. Lond. pl. 64. 1807.

Shrubs, or small trees, with bipinnate leaves and capitate flowers, the heads peduncled, axillary, or in terminal racemes. Calyx 5-toothed or 5-lobed. Corolla funnellform or campanulate, 5-lobed, the petals being united to the middle or above the middle. Stamens numerous; filaments united below, long-exserted, anthers small, glandular-hirsute or glabrous, the pollen-grains agglomerate. Ovary many-ovuled; style filiform. Pod linear, usually narrowed below the middle, flat, not pulpy within, straight or nearly so, elastically dehiscent from the apex, the valves stiff, with raised margins. Seeds obovate or orbicular, compressed. [Commemorates George Annesley (1769–1844), English botanist and traveller.] Over 100 species in tropical and subtropical regions. Type species: *Anneslia falcifolia* Salisb.

Pinnae 2–6 pairs; leaflets many, thin, linear to linear-oblong, 8–16 mm. long; stamens white; plant unarmed.

Pinnae 1 pair; leaflets few, coriaceous, oblong, 4–7 mm. long; stamens red; stipules spinescent.

1. *A. portoricensis*.

2. *A. haematostoma*.

1. **Anneslia portoricensis** (Jacq.) Britton, Mem. Brooklyn Bot. Gard. 1: 50. 1918.

Mimosa portoricensis Jacq. Icon. Rar. 3: 20, pl. 633. 1793.

Acacia portoricensis Willd. Sp. Pl. 4: 1069. 1806.

Calliandra portoricensis Benth. in Hook. Lond. Journ. Bot. 3: 99. 1844.

Acacia leucocephala Bertero; Spreng. Syst. 3: 139. 1826. Not Link.

Fenillea portoricensis Kuntze, Rev. Gen. Pl. 184. 1891.

A shrub, usually not over 3 m. high, rarely a tree up to 8 m. high, the twigs and foliage glabrous or pubescent. Leaves 7–18 cm. long, the slender petiole eglandular; pinnae 2–6 pairs; leaflets 10–30 pairs, linear or linear-oblong, straight or slightly curved, 8–16 mm. long, 2.5 mm. wide or less, few-veined, obtuse, thin; peduncles slender, clustered or solitary, 3–10 cm. long, glabrous or pubescent; heads globose; calyx 2 mm. long; corolla 3–4 mm. long; stamens white, 1.5–2 cm. long; pod 4–10 cm. long, 6–9 mm. wide, glabrous when mature, obtuse, narrowed toward the base; seeds oblong, oblique.

Thickets, hillsides and woodlands at lower and middle elevations, Porto Rico, in dry and moist districts; Culebra; Vieques; St. Jan; Tortola;—Hispaniola; Cuba; Jamaica; continental tropical America; western tropical Africa. COJOBILLO. ZARZA BOBA. WHITE ANNESLIA.

2. **Anneslia haematostoma** (Bertero) Britton, Mem. Brooklyn Bot. Gard. 1: 50. 1918.

Acacia haematostoma Bertero; DC. Mém. Lég. 448. pl. 68. 1825.

Calliandra haematostoma Benth. in Hook. Journ. Bot. 3: 103. 1844.

A much branched shrub 3 m. high or less, the twigs sparingly pilose or glabrous. Leaves small, 1–3 cm. long; petioles short; pinnae 1 pair; leaflets 3–8 pairs, oblong to obovate, 4–7 mm. long, obtuse or mucronulate, strongly few-nerved, coriaceous; peduncles mostly pubescent, usually shorter than the leaves, commonly clustered toward the ends of the branches; calyx striate, about 2 mm. long; corolla silky-pubescent, 5–7 mm. long; stamens red, 1–2 cm. long; pod pubescent, 5–8 cm. long, 6–8 mm. wide.

Calcareous rocks, Peñon, near Guayanilla, Porto Rico; St. Thomas;—Hispaniola; Bahamas; Cuba; Jamaica. RED ANNESLIA.

Anneslia purpurea (L.) Britton [*Mimosa purpurea* L.; *Calliandra purpurea* Benth.; *Inga purpurea* Willd.] Cultivated on St. Croix (according to West), and recorded from St. Thomas by Krebs as SOLDIER WOOD, is native in the Lesser Antilles from Guadaloupe to Grenada.

5. **ALBIZZIA** Durazz. Mag. Tosc. 3: 11. 1772.

Unarmed trees, or some species shrubs, with bipinnate leaves and solitary or paniced heads, umbels or rarely spikes of small, mostly perfect flowers. Calyx 5-toothed. Corolla funnelform, the petals united to about the middle into a tube. Stamens numerous, united below, long-exserted; anthers small; pollen-grains agglomerate. Pod broadly linear, flat, thin, not pulpy within. Seeds suborbicular to oblong. [In honor of the Italian naturalist Albizzi.] About 50 species, natives of the Old World. Type species: *Albizzia Julibrissin* Durazzini.

1. **Albizzia Lebeck** (L.) Benth. in Hook. Journ. Bot. 3: 87. 1844.

Mimosa Lebeck L. Sp. Pl. 516. 1753.

Acacia Lebeck Willd. Sp. Pl. 4: 1066. 1806.

Mimosa speciosa Jacq. Ic. Pl. Rar. 19. 1781.

A tree, up to 15 m. high, often flowering when not over 5 m., the foliage glabrous or sparingly puberulent. Leaves large, often 4 dm. long; petioles 2–10 cm. long, bearing an oblong, sessile gland; pinnae 2–4 pairs; leaflets 4–9 pairs on each pinna, thin, nearly sessile, obliquely oblong or the terminal pair obovate, obtuse, 2–4 cm. long, reticulate-veined; peduncles 3–10 cm. long; umbels subglobose; pedicels pubescent, 2–5 mm. long; calyx narrowly campanulate, pubescent, about 4 mm. long, its teeth short; corolla about 6 mm. long; stamens yellowish, about 3 cm. long; pod straight, broadly linear, narrowed at each end, 1.5–3 dm. long, 2–4 cm. wide, glabrous, shining, rattling in the wind; seeds about 1.5 cm. broad.

Roadsides, hills and fields, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; naturalized, after planting for shade. Native of Old World tropics. Widely naturalized in the West Indies. The dark brown wood is hard, strong and durable. AMOR PLATONICO. ACACIA AMARILLA. WOMEN'S TONGUES. THIBET TREE. Recorded by Urban as also called FLAMBOYAN in Porto Rico, but that name belongs to *Delonix regia*.

Albizzia stipulata Boiv., planted at Mayaguez, has many small linear falcate leaflets, smaller flowers and pods. It is native of tropical Asia.

Albizzia procera (Willd.) Benth., a species of tropical Asia, was listed by Krebs as found in St. Thomas, certainly not indigenous there. [*Acacia procera* Willd.]

6. **VACHELLIA** Wight & Arn. Prodr. 272. 1834.

Shrubs or small trees with spinescent stipules, bipinnate leaves, the leaflets small and numerous, and small polygamous flowers in peduncled, globose heads. Calyx 5-toothed. Corolla tubular-funnelform, 5-toothed, the petals being united nearly to their tips. Stamens numerous; filaments distinct, exserted; anthers minute. Ovary sessile, several-many-ovuled; style filiform. Pod nearly terete, pulpy within, the valves coriaceous, very tardily dehiscent. Seeds in 2 separate rows. [In honor of Rev. C. H. Vachell, missionary and botanical collector in China.] Species one or more, natives of tropical regions, the following typical.

1. **Vachellia Farnesiana** (L.) Wight & Arn. Prodr. 272. 1834.

Mimosa Farnesiana L. Sp. Pl. 521. 1753.

Acacia Farnesiana Willd. Sp. Pl. 4: 1083. 1803.

Acacia acicularis Willd. Enum. 1056. 1809.

Usually a shrub not over 3 m. high, rarely a small tree up to 9 m., much branched, the twigs glabrous or nearly so. Leaves 5–10 cm. long, with a small gland on the petiole; stipular spines whitish, 0.5–5 cm. long; pinnae 2–6 pairs;

petiole and rachis commonly pubescent; leaflets 10–25 pairs, linear, or linear-oblong, obtuse, 3–5 mm. long; peduncles slender, pubescent, 2–4 cm. long; heads of flowers about 12 mm. in diameter, fragrant, bright yellow; pod subterete, turgid, somewhat curved, glabrous, 4–7 cm. long, about 1 cm. thick.

Thickets at lower elevations, Porto Rico, mostly in dry districts; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida; West Indies; tropical continental America; Old World tropics. AROMA. CASHA.

7. **ACACIA** Willd. Sp. Pl. 4: 1049. 1806.

Trees or shrubs with bipinnate leaves, or the leaves reduced to phyllodes in Australasian species, the small flowers in heads or spikes. Calyx campanulate 4–5-toothed or of distinct sepals. Petals more or less united, rarely distinct. Stamens numerous, sometimes 50 or more, distinct, or united only at the base; anthers very small. Ovary mostly stipitate; style filiform. Pod linear to oblong, straight, contorted or curved, compressed or flat, usually dehiscent, the seeds not in two distinct rows. [Greek, referring to the spiny branches of some species.] A very large genus, of perhaps 450 species, widely distributed in tropical and warm-temperate regions. Type species: *Acacia nilotica* Delile.

Flowers spicate.

Leaflets 8–16 pairs, elliptic to oblong, 6–10 mm. wide; unarmed native tree.

Leaflets 25–50 pairs, linear, about 1 mm. wide; prickly naturalized tree.

Flowers capitate.

Climbing vine, armed with recurved prickles.

Trees or shrubs.

Leaflets 1 or 2 pairs, oblong or obovate.

Leaflets many pairs, linear.

Involucre subtending the heads of flowers.

Leaflets 15–40 pairs; pod somewhat flattened.

Leaflets 10–20 pairs; pod subterete.

Involucre at about the middle of the peduncle; pod flat, constricted between the seeds.

1. *A. muricata*.

2. *A. Suma*.

3. *A. riparia*.

4. *A. anegadensis*.

5. *A. macracantha*.

6. *A. tortuosa*.

7. *A. nilotica*.

1. **Acacia muricata** (L.) Willd. Sp. Pl. 4: 1058. 1806.

Mimosa muricata L. Syst. ed. 10, 1311. 1759.

Acacia nudiflora Willd. Sp. Pl. 4: 1058. 1806.

An unarmed tree up to 15 m. high, the young twigs finely pubescent. Leaves 2 dm. long or less, pubescent when young, becoming glabrous, or the petiole and rachis permanently pubescent; glands orbicular, scutellate, elevated; pinnae 4–6 pairs; leaflets 8–16 pairs, elliptic or oblong, inequilateral, 10–18 mm. long, 10 mm. wide or less, coriaceous, obtuse at the apex, rounded or subcordate at the base, dark green and shining above, paler and dull beneath; spikes slender, 7–15 cm. long, many-flowered, the rachis pubescent; flowers small, whitish; calyx about 1.5 mm. long, with 5 short teeth; pod broadly linear, short-stipitate, glabrous, dehiscent, coriaceous, straight or curved, flat, brown and transversely white-banded within, 5–15 cm. long, 10–20 mm. wide, the margins entire or crenate; seeds flat.

Hillsides, plains and woodlands at lower elevations, eastern and southern districts of Porto Rico; Vieques; Culebra; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Antigua; Guadeloupe; Dominica; Martinique. Recorded from Hispaniola. Its reddish brown wood is hard, heavy, strong and durable. TAMARINDO CIMARRON. ACACIA NUDOSA. SPINELESS ACACIA. AMARAT.

2. **Acacia Suma** (Roxb.) Kurz; Brandis, For. Fl. 187. 1874.

Mimosa Suma Roxb. Fl. Ind. 2: 563. 1832.

A tree up to 10 m. high, with hard and durable wood, the slender twigs pale grey or nearly white, the stipular spines conic, short or wanting. Leaves up to 2 dm. long, the pubescent petiole bearing a large elliptic gland; pinnae 10–40

pairs; leaflets 25–50 pairs, linear, 4–8 mm. long, acutish, 1-nerved, puberulent or glabrate; inflorescence tomentulose, the small, white flowers in axillary and terminal, slender spikes 6–10 cm. long; calyx tomentulose, about 2 mm. long; corolla about 3 mm. long; pod linear-boloug, flat, glabrous, finely reticulate-veined, 6–12 cm. long, 1–1.5 cm. wide. [*A. Catechu* of Krebs, of Eggers and of Millspaugh.]

Thickets and valleys, St. Croix:—Jamaica; Grenada. Native of the Old World tropics. CATECHU TREE.

3. ***Acacia riparia*** H. B. K. Nov. Gen. 6: 276. 1823.

Acacia Westiana DC. Prodr. 2: 464. 1825.

A vine, climbing or spreading, often 6 or 7 m. long or longer, or shrubby, and recorded as sometimes a tree, the branches armed with recurved prickles, glabrous. Leaves glabrous or nearly so, 7–15 cm. long, the petiole usually bearing a scutellate gland and sometimes 1 or 2 recurved prickles; pinnae 4–12 pairs; leaflets 15–40 pairs, glabrous, linear-oblong, thin, slightly inequilateral, 6–10 mm. long, obtuse or acutish at the apex, obliquely subtruncate at the base; heads globose, 1–1.5 cm. in diameter when in flower; flowers sessile or very nearly so; calyx about 1 mm. long; corolla 2–3 mm. long; stamens white; pod flat, 6–20 cm. long, slender-stipitate, 1.5–2.5 cm. wide, obtuse, acute, acuminate or apiculate at the apex, narrowed at the base, the valves chartaceous, finely tomentulose or glabrous. [*A. sarmentosa* of Krebs and of Grisebach, not of Desvauz; *Mimosa paniculata* of West.]

Hillsides, river-banks and thickets at lower and middle elevations, Porto Rico, ascending to about 700 meters on Monte Alegriño; Culebra; Vieques; St. Croix (according to West); St. Thomas; St. Jan; Tortola:—Hispaniola; Trinidad and tropical continental America. Recorded as sometimes forming a tree, but not so observed by us in the West Indies. The old stems become 8 cm. in diameter or thicker, with 4 rounded ridges. ZARZA. CATCH-AND-KEEP.

4. ***Acacia anegadensis*** Britton, Mem. N. Y. Bot. Gard. 6: 572. 1916.

An intricately branched tree, up to 8 m. high, the main branches widely spreading, the slender twigs tortuous, glabrous. Stipules a pair of rigid, acicular, persistent spines 5–15 mm. long; leaves 2–3 cm. long; petiole glabrous, or sparingly pubescent, 3–6 mm. long, channeled above, bearing a sessile, saucer-shaped gland about 0.5 mm. in diameter at the top; pinnae 1-pair; petiolules a little longer than the similar petiole, with a smaller, similar gland between the leaflets; leaflets 1-pair, rarely 2-pairs, sessile, obliquely oblong or oblong-obovate, coriaceous, glabrous, 10–16 mm. long, strongly and loosely reticulate-veined, rounded or emarginate at the apex, obliquely obtuse at the base, lustrous on both sides; peduncles solitary or 2–4 together in the upper axils, slender, loosely pubescent, shorter than the leaves; heads globose, in flower 5–6 mm. in diameter; flowers yellow; calyx minutely toothed, about 0.6 mm. long; corolla narrow, its teeth effiliate, much shorter than the tube; stamens about 20, 3–4 mm. long, the filaments filiform, the anthers minute; pod short-stipitate, linear, curved, apiculate, glabrous, veiny, 3–4 cm. long, swollen, the dry subcoriaceous valves very tardily deliscent; seeds compressed, suborbicular, brown, dull, 3–4 mm. in diameter, 1.5 mm. thick.

Abundant on the rocky plain, and occasional on the sandy plain near the West End, Anegada. Endemic.

5. ***Acacia macracantha*** H. & B.; Willd. Sp. Pl. 4: 1080. 1806.

Mimosa lutea Mill. Gard. Dict. ed. 8. 1768.

Acacia flexuosa H. & B.; Willd. Sp. Pl. 4: 1082. 1806.

Acacia obtusa Willd. loc. cit. 1087. 1806.

Acacia macracanthoides Bert.; DC. Prodr. 2: 463. 1825.

Acacia lutea Britton, Bull. Torr. Club **16**: 327. 1889. Not Leavenw. 1824.

Acacia macracantha glabrens Eggers, Bull. U. S. Nat. Mus. **13**: 49. 1879.

A widely branched tree, 5–15 m. high or sometimes a shrub, the young twigs slender, tomentose or pubescent, the tortuous branches armed with stipular spines 9 cm. long or less, or sometimes unarmed, the spines on the trunk sometimes longer. Leaves tomentose or pubescent, the short petiole bearing a sessile depressed gland or glandless; pinnae 15–40 pairs, short-stalked, 2–4 cm. long; leaflets 15–40 pairs, linear, 2–5 mm. long, obtuse, sessile, glabrous or nearly so; peduncles clustered or solitary in the upper axils, slender, pubescent, 1–3 cm. long; flowers yellow, capitate; heads globose, 8–10 mm. in diameter, subtended by an involucre; pod linear, tomentulose, turgid-compressed, 6–10 cm. long, straight or a little curved, continuous or more or less tortulose, somewhat pulpy.

Forming thickets on Vieques; St. Croix; St. Thomas; St. Jan; Tortola.—Bahamas; Cuba; Jamaica; Hispaniola; St. Martin; St. Eustatius; Guadeloupe; Martinique; Grenada; Margarita; continental tropical America. WILD TAMARIND. CACIA. STINK CASHA.

6. ***Acacia tortuosa*** (L.) Willd. Sp. Pl. **4**: 1083. 1806.

Mimosa tortuosa L. Syst. ed. 10, 1312. 1759.

A shrub or a small tree up to 8 m. high, the twigs pubescent, the branches tortuous, the stipular spines 1–4 cm. long. Leaves more or less pubescent, the short petiole bearing an oblong gland or glandless; pinnae 2–8 pairs, 3 cm. long or less; leaflets 10–20 pairs, linear-oblong, obtuse, glabrate, 4–7 mm. long; peduncles solitary or clustered, slender, pubescent, 2–4 cm. long; flowers yellow, capitate; heads globose, about 8 mm. in diameter, subtended by an involucre; pod subterete, linear, puberulent, at least when young, 8–15 cm. long, straight or curved, about 8 mm. thick.

Hillsides, St. Thomas; St. Croix; Tortola.—Jamaica; Hispaniola; St. Eustatius; Guadeloupe; Montserrat; Martinique; Bonaire; Curaçao; Aruba; continental tropical America. ACACIA BUSH. Called *Cassia* in the Virgin Islands.

7. ***Acacia nilotica*** (L.) Delile, Fl. Aegypt. 79. 1812.

Mimosa nilotica L. Sp. Pl. 521. 1753.

Acacia arabica Willd. Sp. Pl. **4**: 1085. 1806.

Mimosa arabica Lam. Encycl. **1**: 19. 1783.

A shrub or a tree up to about 8 m. high, the slender twigs pubescent or glabrate, with a pair of stipular, acicular or slender-subulate pale spines up to 4 cm. long at some or all of the nodes. Leaves petioled, 5–15 cm. long, more or less pubescent, the petiole and rachis usually bearing a few glands; pinnae 3–8 pairs; leaflets 10–30 pairs, linear-oblong, 5–8 mm. long, 1-nerved, obtuse; flowers yellow; in dense, globose, peduncled axillary heads about 1.5 cm. in diameter, the peduncle bearing an involucre at or above the middle; pod linear, nearly flat, 5–15 cm. long, white-tomentulose or glabrate, 8–15 mm. wide, constricted between the seeds, short-beaked.

Naturalized near dwellings on St. Croix and St. Thomas.—Jamaica; Cuba; Antigua; Guadeloupe; Montserrat; Martinique; Grenada; Native of tropical Africa. Occasionally planted for ornament in the Virgin Islands and on Porto Rico. GUM ARABIC TREE.

Acacia Senegal Willd., native of tropical Africa, a tree with bipinnate leaves, the numerous pale green oblong leaflets about 6 mm. long, the white flowers densely spicate, the very flat pod about 8 cm. long and 2 cm. wide, was found planted at Lamosure, St. Jan, in 1913.

Acacia nigricans R. Br., a species of Australia, was listed by Krebs as found in St. Thomas prior to 1851; it may, possibly, have been planted there.

Acacia macrostachya Rchb., native of western tropical Africa, was also recorded by Krebs from St. Thomas.

Acacia decurrens Willd., BLACK WATTLE, Australian, has been experimentally planted for forestry purposes in Porto Rico and planted by Mr. A. S. Fairchild at Louisenhøj, St. Thomas. It is an unarmed tree, the leaves with many small linear leaflets.

Under the Spanish name "Carbonero" a tree of very rapid growth, recorded as native of Colombia, has been experimentally planted at the Forest Station, Rio Piedras, Porto Rico; it attained in 1923, after about three year's growth, a height of 7 meters with a trunk up to 1 decimeter in diameter; it has bipinnate leaves of many small oblong leaflets and linear flat pods about 9 cm. long. It appears to be a species of *Acacia*.

8. **LEUCAENA** Benth. in Hook. Journ. Bot. 4: 416. 1842.

Unarmed trees or shrubs, with bipinnate leaves, the white flowers in peduncled heads. Calyx narrowly campanulate, 5-toothed. Petals 5, distinct, valvate. Stamens 10, distinct, exserted, the anthers not gland-bearing, often pilose. Ovary stipitate; ovules numerous; style filiform; stigma minute. Pod broadly linear, flat, membranous, completely 2-valved, the ovate or obovate flat seeds transverse. [Greek, referring to the white flowers.] About 10 species, mostly of tropical America, the following typical.

1. **Leucaena glauca** (L.) Benth. in Hook. Journ. Bot. 4: 416. 1842.

Mimosa glauca L. Sp. Pl. 520. 1753.

Acacia glauca Willd. Sp. Pl. 4: 1075. 1803.

Acacia leucocephala Link, Enum. 2: 444. 1822.

Usually a tree in Porto Rico, sometimes 20 m. high, but sometimes a shrub 3 m. high or less, the young twigs puberulent. Leaves 1-2 dm. long; petiole 3-6 cm. long, with or without a gland; pinnæ 3-10 pairs, the upper ones little shorter than the lower; leaflets 10-20 pairs to each pinna, oblong or lanceolate, thin, 8-15 mm. long, inequilateral, acute at the apex, obliquely narrowed at the base, light green above, pale beneath; heads globular, axillary or terminal, mostly clustered, 1.5-3 cm. in diameter; peduncles stout, puberulent or pubescent, 2-3 cm. long; calyx obconic, 1 mm. long, its short teeth blunt; petals linear-spatulate, pubescent; stamens about 3 times as long as the petals; ovary pubescent; pods several or numerous, linear, 10-15 cm. long, about 1.5 cm. wide, abruptly acute or mucronate at the apex, tapering at the base, the thin valves with raised margins. [*Acacia portoricensis* of Bello, not of Willdenow.]

Hillsides, woodlands and thickets at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—West Indies; Florida; tropical continental America and in the tropics of the Old World. Its brownish wood is hard and durable. Horses, browsing on the foliage, are reported to lose tails and manes. HEDIONDILLA. ACACIA PALIDA. CAMPECHE. WILD TAMARIND. TANTAN.

9. **ACUAN** Medic. Theod. 62. 1786.

Perennial herbs or shrubs, with bipinnate leaves, small stipules, and greenish or whitish small regular flowers in axillary peduncled heads or spikes. Flowers perfect, sessile, or the lowest sometimes staminate, neutral or apetalous. Calyx campanulate, its teeth short. Petals valvate, distinct, or slightly united or coherent below. Stamens 10 or 5, distinct, mainly exserted; anthers all alike. Ovary nearly sessile; ovules 2. Pod linear, straight or curved, acute, flat.

several-seeded, 2-valved, the valves coriaceous or membranous. [Name unexplained.] About 10 species, natives of warm and tropical America, one widely distributed in tropical regions of the Old World. Type species: *Mimosa virgata* L.

Pods 6-9 cm. long; plant erect or ascending.
 Pods 2-6 cm. long; plant diffuse.

1. *A. virgatum*.
 2. *A. depressum*.

1. **Acuan virgatum** (L.) Nedic. Theod. 62. 1786.

Mimosa virgata L. Sp. Pl. 519. 1753.

Desmanthus virgatus Willd. Sp. Pl. 4: 1047. 1806.

Desmanthus strictus Bertol. Giorn. Arcad. 21: 190. 1824.

Desmanthus virgatus strictus Griseb. Fl. Br. W. I. 218. 1860.

Acacia leptosperma Bello, Anales Soc. Esp. Hist. Nat. 10: 265. 1881.

Stem erect or ascending, glabrous, or sparingly pubescent above, branched, 0.5-2 m. high. Stipules subulate, 2.5-4 mm. long; leaves 2-8 cm. long, short-petioled, the petiole and rachis sometimes pubescent; pinnae 1-7 pairs, the gland between the lower pair usually oblong, conspicuous; leaflets 10-20 pairs, linear or linear-oblong, 4-9 mm. long, thin, obtuse or apiculate at the apex, subtruncate at the base; heads few-several-flowered; peduncles solitary in the axils, slender, 2-5 cm. long; flowers white; stamens 10, about twice as long as the petals; pod straight or slightly curved, 6-9 cm. long, 3-4 mm. wide, acute or apiculate, smooth.

Banks, thickets and hillsides at lower and middle elevations; Porto Rico; Icosos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—Florida; West Indies, south to Tobago, east to Anegada; continental tropical America. DESMANTO.

2. **Acuan depressum** (H. & B.) Kuntze, Rev. Gen. Pl. 158. 1891.

Desmanthes depressus H. & B.; Willd. Sp. Pl. 4: 1046. 1806.

Mimosa depressa Poir, in Lam. Encycl. Suppl. 1: 58. 1810.

Diffusely branched, prostrate or ascending, seldom over 3 dm. high, glabrous or sparingly pubescent. Stipules subulate, 3.5 mm. long or less; leaves short-petioled, 1.5-4 cm. long; pinnae 1-5 pairs, the gland between the lowest pair small, mostly orbicular; leaflets 10-20 pairs, linear, 3-5 mm. long, thin, obtuse at the apex, obtuse or subtruncate at the base; heads few-flowered, on solitary axillary peduncles; stamens 10, about 6 mm. long, twice as long as the petals; pod straight or slightly curved, 2-6 cm. long; about 3 mm. wide.

Hillsides at lower elevations, eastern and southern districts of Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; Bahamas; Jamaica; Cuba; Hispaniola; St. Thomas and St. Jan to Martinique; Curaçao; continental tropical America.

10. **MORONGIA** Britton, Mem. Torr. Club 5: 191. 1894.

Perennial herbs, or shrubs, arching, prostrate or procumbent, armed with recurved prickles. Leaves bipinnate, usually sensitive; leaflets numerous, small; stipules setaceous. Flowers regular, small, 4-5-parted, pink or purple, perfect or polygamous, in axillary peduncled heads or spikes. Stamens usually 8-12, distinct, or united at the base; anthers all alike. Ovary nearly sessile; ovules ∞ . Pod linear, acute or acuminate, spiny all over, at length 4-valved, several-seeded. [Named in honor of Thos. Morong, 1827-1894, American botanist.] About 10 species, natives of warm and tropical America, 1 in tropical Africa. Type species: *Schrankia aculeata* Willd.

1. *Morongia portoricensis* (Urban) Britton.

Schrankia portoricensis Urban, Symb. Ant. 2: 267. 1900.

A shrub, 2 m. high or less, glabrous or very nearly so, the long slender angled branches armed with numerous recurved prickles 1.5–2.5 mm. long. Stipules subulate, 6–12 mm. long; leaves 7–12 cm. long; petiole and rachis slender, armed with recurved prickles; pinnae 4–7 pairs, rather distant; leaflets 10–20 pairs, linear, thin, inconspicuously veined, 3–6 mm. long, or the lowest pair shorter, obtuse or acutish at the apex, obtuse at the base; heads axillary, solitary, about 8 mm. in diameter, on peduncles 1–2 cm. long; flowers yellowish, very nearly sessile; calyx about 0.5 mm. long; corolla glabrous, about 3 mm. long, its lanceolate lobes about as long as the tube; stamens 6 mm. long, the filaments united at the base; pod nearly terete, 8–18 cm. long, 4–5 mm. in diameter, its subulate beak 1–2 cm. long, its valves armed with few distant prickles; seeds rectangular-oblong, black, 4–5 mm. long. [*Schrankia leptocarpa* Bello, not DC.; *S. distachya* Stahl, not DC.; *Morongia leptoclada* and *M. distachya* of Cook and Collins.]

Thickets and woodlands, vicinity of Coamo, Porto Rico, apparently local. Endemic. ZARZARILLA.

11. *MIMOSA* L. Sp. Pl. 516. 1753.

Herbs, shrubs or rarely trees, mostly with 2-pinnate, often sensitive leaves, the small, regular, mostly 4–5-parted, perfect or sometimes polygamous flowers in axillary, peduncled heads or spikes. Calyx small, its teeth short. Petals valvate, connate below, hypogynous. Stamens as many as the petals or twice as many, distinct, exserted; filaments mostly filiform; anthers small, eglandular. Ovary 2–many-ovuled; style slender or filiform; stigma terminal, small. Pod linear or oblong, usually flat, often transversely jointed, 2-valved with the continuous margins persistent. Seeds compressed. [Greek, referring to the sensitive leaves of some species.] Over 300 species, natives of warm and tropical regions. Type species: *Mimosa sensitiva* L.

Low, herbaceous; pods jointed; stamens as many as the petals.
Climbing prickly vine; pods not jointed; stamens twice as many as the petals.

1. *M. pudica*.
2. *M. Ceratonia*.

1. *Mimosa pudica* L. Sp. Pl. 518. 1753.

Herbaceous, or a little woody, loosely pubescent with long hairs or glabrate, branched, 5 dm. high or less, the stems and branches armed with rather stout, somewhat curved prickles 2–4 mm. long. Stipules lanceolate, striate, acuminate, 3–6 mm. long; petioles slender, with a pulvinus at base, 2–6 cm. long, deflexed when touched; pinnae 1 pair or 2 approximate pairs, also with a pulvinus at base, 2–6 cm. long; leaflets 15–25 pairs, thin, linear, 6–10 mm. long, 1.5–2 mm. wide, folding when touched, acutish at the apex, obliquely rounded at the base; heads ovoid, axillary; peduncles 1–2 cm. long; calyx minute; petals and stamens 4; stamens pink, fading white; pods linear-oblong, 2–5-jointed, 1–1.5 cm. long, 3 mm. wide, constricted at the joints, the margins armed with slender straight prickles, otherwise glabrous.

Fields, banks and roadsides at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas.—Andros Island, Bahamas; Jamaica; Cuba to Trinidad; continental tropical America. Naturalized in tropical Asia and in Australasia. MORIVIVI. SENSITIVA. SENSITIVE PLANT.

2. *Mimosa Ceratonia* L. Sp. Pl. 523. 1753.

A glabrous woody vine, often 6 m. long, trailing or climbing, or sometimes shrubby, the angular branches and slender petioles armed with hooked prickles. Stipules subulate, 2–3 mm. long; pinnae 1–5 pairs, the rachis with small hooked

prickles, the petiolules 6–10 mm. long; leaflets 3–5 pairs, obliquely obovate, inequilateral, thin, 3-nerved, 1–2.5 cm. long, rounded at the apex, paler beneath than above; heads in terminal racemes or narrow panicles, often numerous; peduncles prickly, 2 cm. long or less; petals mostly 3; stamens mostly 6, white or pinkish, about 8 mm. long; pod oblong, straight or a little curved, 6 cm. long or less, 14–18 mm. wide, flat and thin, glabrous, shining, not jointed, its margins armed with hooked prickles. [? *M. sensitiva* of West.]

Hillsides and thickets, Porto Rico, ascending to at least 900 m.; Vieques; St. Croix(?); St. Thomas; St. Jan; Tortola.—Hispaniola to St. Vincent. ZARZA. BLACK AMBRET. CLIMBING MIMOSA.

Mimosa pigra L. (*M. asperata* L.) was recorded by Grisebach from St. Thomas, but the plant has not been found there by recent collectors; it is not known within the geographical range of this Flora, but occurs elsewhere in the West Indies.

Mimosa acantholoba (H. & B.) Polr., a species of Ecuador, recorded by Krebs as found in St. Thomas, must be an error in determination [*Acacia acantholoba* H. & B.].

12. NEPTUNIA Lour. Fl. Coch. 653. 1790.

Prostrate, diffuse or floating perennial herbs, some species a little woody, with bipinnate leaves, and axillary, solitary, long-peduncled heads of more or less imperfect and perfect flowers. Calyx campanulate, with 5 short teeth. Petals 5, distinct, or united below the middle. Stamens mostly 10, distinct, exerted, the anthers bearing a stalked gland. Ovary stipitate, several-many-ovuled; style filiform with a terminal capitate stigma. Pods broadly linear or narrowly oblong, stipitate, flat, commonly recurved, impressed between the ovate transverse seeds, 2-valved, the valves thin-coriaceous. [Dedicated to Neptune.] About 10 species, of America, tropical Asia and Australasia. Type species: *Neptunia oleracea* Lour.

1. *Neptunia plena* (L.) Benth. in Hook. Journ. Bot. 4: 355. 1842.

Mimosa plena L. Sp. Pl. 519. 1753.

Desmanthus plenus Willd. Sp. Pl. 4: 1045. 1806.

Desmanthus punctatus Willd. Sp. Pl. 4: 1047. 1806.

Glabrous, the slender branches prostrate or ascending, 3–6 dm. long. Stipules ovate to lanceolate, thin, oblique, 4–6 mm. long; leaves 4–10 cm. long, with slender petioles; pinnae 2–4 pairs; leaflets 12–20 pairs, linear, thin, faintly veined, 4–10 mm. long, obtuse; peduncles 6–12 cm. long, usually bearing 1 or 2 cordate bracts at or below the middle; heads ovoid; flowers yellow, the upper ones perfect, the lower staminate, or neutral with exerted staminodes; pods 2–5 cm. long, about 8 mm. wide, acute or apiculate, thickened on the margins.

Moist or wet sandy soil and in ponds, Porto Rico, local near the coasts:—Bahamas; Cuba; Hispaniola; Antigua to Grenada; Curaçao; tropical continental America. Recorded by Krebs as formerly found in St. Thomas. WATER NEPTUNIA. DESMANTO AMARILLO.

Neptunia pubescens Benth. was recorded by Baron Eggers as found on Buck Island, St. Thomas, many years ago; we failed to find it during two visits to Buck Island in 1913. Professor Paulsen informs us that no specimen is preserved in the Copenhagen herbarium.

13. **ADENANTHERA** L. Sp. Pl. 384. 1753.

Unarmed trees with bipinnate leaves and long narrow racemes of small flowers, axillary, or in terminal clusters. Calyx campanulate, 5-toothed. Petals 5, united below the middle or nearly distinct. Stamens 10, distinct, about as long as the corolla; filaments slender; anthers bearing a deciduous gland. Ovary many-ovuled, sessile; style filiform with a small, terminal stigma; pod linear, usually curved, compressed, but swollen over the seeds, at length 2-valved, the valves twisting after dehiscence; seeds thick, suborbicular, compressed, hard and shining, mostly red. [Greek, glandular anther.] Three or four species, natives of the Old World tropics, the following typical.

1. **Adenantha pavonina** L. Sp. Pl. 384. 1753.

A tree, up to 15 m. high, glabrous or very nearly so throughout. Leaves large, often 5 dm. long, stout-petioled; pinnae 2-5 pairs; leaflets 11-21, mostly alternate, oblong-elliptic, thin, obtuse at each end, or emarginate, or apiculate, 1.5-4 cm. long, with short petiolules; racemes narrow, erect, 10-18 cm. long; pedicels 1.5-2.5 mm. long; calyx about 1 mm. long; petals acutish, about 3 mm. long; pod somewhat fleshy, 1.5-2.5 dm. long, about 13 mm. wide; seeds compressed-lenticular, red, shining, suborbicular, about 8 mm. broad.

Occasionally planted and locally escaped from cultivation in Porto Rico; St. Thomas; St. Jan (according to Eggers);—naturalized in Jamaica and in the Lesser Antilles. Native of tropical Asia. The wood yields a red dye, and is used in cabinet work. MATO COLORADO. CORALITOS. PALO DE MATO. PERONILAS. COQUELICOT. CIRCISSIAN BEAN.

14. **PROSOPIS** L. Mant. 1: 10. 1767.

Trees, with bipinnate leaves, and small, nearly or quite sessile flowers, in axillary spikes or rarely capitate. Calyx campanulate, 5-toothed. Petals 5, valvate. Stamens 10, distinct, the anthers usually bearing a deciduous gland. Ovary many-ovuled; style filiform; stigma small and terminal. Pod linear, subterete or somewhat flattened, coriaceous, indehiscent, the mesocarp spongy. Seeds flattened. [Greek name of some plant.] About 15 species, natives of tropical and subtropical regions. Type species: *Prosopis spicigera* L.

1. **Prosopis juliflora** (Sw.) DC. Prodr. 2: 447. 1825.

Mimosa juliflora Sw. Prodr. 85. 1788.

Acacia salinarum DC. Prodr. 2: 456. 1825.

A tree, up to 13 m. high, but usually smaller, with widely spreading branches, armed with stipular slender straight spines 1-4 cm. long, the smooth bark brown, the slender twigs glabrous or nearly so. Leaves glabrous, or when young sparingly ciliate, 0.7-2 dm. long; petioles slender, 1-4 cm. long; pinnae 1 or 2 pairs, short-stalked; leaflets 12-20 pairs, linear-oblong, sessile, 7-16 mm. long, strongly few-veined, obtuse or mucronulate at the apex, obliquely obtuse at the base; flowers greenish or yellowish, in dense cylindrical peduncled spikes 5-10 cm. long, 7-8 mm. thick; calyx about 1 mm. long, its teeth short; petals about 2.5 mm. long, acute, villous within; ovary villous; pod compressed, falcate, 7-20 cm. long, 8-10 mm. wide, 5-7 mm. thick when mature.

Thickets, southern coastal plain of Porto Rico; St. Thomas (ex Krebs); hillsides, Tortola;—Cuba; Hispaniola; Montserrat; Bonaire; Curaçao; Aruba; continental tropical America, introduced into the Bahamas and naturalized in the Philippines. Commonly planted in Porto Rico, and occasionally in the Virgin Islands, for ornament and for the use of its pods as food for cattle. MESQUITE.

15. **PIPTADENIA** Benth. in Hook. Journ. Bot. 4: 334. 1842.

Trees or shrubs with bipinnate leaves, the white or greenish perfect or polygamous flowers spicate or capitate. Calyx campanulate, slightly 5-toothed. Petals 5, mostly united to about the middle. Stamens 10, exserted, distinct; anthers usually tipped by a deciduous gland. Ovary sessile, several-many-ovuled. Pod linear, flat, not jointed, 2-valved, not pulpy between the seeds, the valves entire. Seeds flat, without endosperm, with a filiform funicle. [Greek, deciduous gland.] About 40 species, mostly tropical American, a few in tropical Africa. Type species: *Piptadenia latifolia* Benth.

1. **Piptadenia peregrina** (L.) Benth. in Hook. Journ. Bot. 4: 340. 1842.

Mimosa peregrina L. Sp. Pl. 520. 1753.

Acacia peregrina Willd. Sp. Pl. 4: 1073. 1806.

Acacia angustifolia DC. Prodr. 2: 470. 1825.

An unarmed tree up to 20 m. high, the young twigs and leaves puberulent, the mature foliage glabrous or very nearly so, the bark of the trunk suberos-verrucose, nearly black. Pinnae numerous, up to 30 pairs or more, narrow; leaflets numerous, often 25 pairs or more, sessile, linear, 2-4 mm. long, very inconspicuously veined, acutish, approximate; heads usually numerous, globose, about 10 mm. in diameter, on slender puberulent peduncles 1-3 cm. long; flowers white; calyx very small; pod 8-17 cm. long, 10-18 mm. wide, somewhat constricted between the seeds, the valves coriaceous; seeds suborbicular, very thin and flat, black, shining, about 10 mm. wide.

Woodlands and hillsides, Porto Rico, at lower and middle elevations:—Hispaniola; Dominica; St. Vincent; Grenada; South America. The red-brown wood is hard, heavy, strong and durable. COJOBANA. COJOBILLO. PIPTADENIA.

16. **ENTADA** Adans. Fam. Pl. 2: 318. 1763.

High-climbing, unarmed vines, with bipinnate leaves, and small, perfect or polygamous flowers in clustered spikes. Calyx 5-toothed. Petals 5, distinct or coherent at the base. Stamens 10, distinct, slightly exserted, the anthers bearing a deciduous gland. Ovary many-ovuled; style filiform, with a small terminal stigma. Pod very large, flattened, transversely jointed within the continuous margins, coriaceous or woody, the joints 1-seeded. Seeds large, orbicular. [Malabar name.] About 10 species, natives of tropical regions. Type species: *Mimosa Entada* L.

1. **Entada polyphylla** Benth. in Hook. Journ. Bot. 2: 133. 1840.

Young twigs finely puberulent. Leaves 1.5-2.5 dm. long, the petiole-base somewhat swollen; pinnae 4-6 pairs, short-stalked; leaflets 10-20 pairs, oblong, sessile, 8-12 mm. long, glabrate or puberulent, obtuse or emarginate at the apex, narrowed or rounded at the base, pinnately veined, the midvein quite prominent beneath; spikes cylindric, brownish, 4-5 cm. long, about 3 mm. thick, very numerous in terminal racemes; pod coriaceous, about 6 cm. wide.

River bank near Fajardo and in sandy soil near Vega Baja, Porto Rico:—South America. TAMARINDILLO.

Enterolobium cyclocarpum (Jacq.) Griseb., of Jamaica and continental tropical America, a large spreading tree up to 20 m. high or higher, occasionally planted in Porto Rico for shade or ornament, has glabrous large bipinnate leaves, the numerous leaflets linear-oblong, glaucous beneath, 8-13 mm. long; the small

flowers are in axillary peduncled heads, the corolla about 5 mm. long; the large flat pod is curved into a complete circle 8-10 cm. broad. [*Mimosa cyclocarpa* Jacq.]

Lysiloma latisiliqua (L.) Benth., of the Bahamas, Cuba and Hispaniola, was listed by Krebs as found in St. Thomas, presumably in error. [*Acacia latisiliqua* L.; *Lysiloma Sabicu* Benth.]

Parkia biglandulosa W. & A., East Indian, seen in the collection of trees at the Agricultural Experiment Station at Mayaguez, forms an elegant tree at least 18 m. high, with spreading branches, the large bipinnate leaves velvety, the very numerous leaflets 6-8 mm. long and close together; the white flowers are in long-peduncled heads, those of the lower part of the head sterile, those of the upper part fertile.

Family 7. CAESALPINIACEAE Kl. & Gareke.

SENNA FAMILY.

Trees, herbs or shrubs, with alternate, simple or compound, mostly stipulate leaves. Flowers mostly clustered and perfect, sometimes monoecious, dioecious or polygamous, nearly regular, or irregular. Calyx mostly of 5 sepals or 5-toothed. Petals usually 5, imbricated, and the upper (unpaired) one enclosed by the lateral ones in the bud. Stamens 10 or fewer in our genera, the filaments distinct, or more or less united. Ovary 1-celled, 1-many-ovuled. Fruit a legume, mostly dehiscent into 2 valves. Seeds with or without endosperm. About 90 genera and 1000 species, mostly of tropical distribution.

- A. Leaves simple, entire or 2-lobed; calyx gamosepalous. 1. *Bauhinia*.
 B. Leaves pinnate or bipinnate, of 2 to many leaflets; calyx-segments separate nearly or quite down to the receptacle.
 a. Leaves simply pinnate or 2-foliate.
 *Anthers versatile, longitudinally dehiscent.
 Ovary free from the receptacle.
 Leaves glandless; stamens naked. 2. *Cynometra*.
 Leaves black-glandular beneath; filaments woolly. 3. *Stahlia*.
 Ovary, or its stipe, adnate to the receptacle.
 Leaflets a single pair; pod woody. 4. *Hymenaea*.
 Leaflets many; pod pulpy within. 5. *Tamarindus*.
 **Anthers basifixed, mostly opening by a terminal pore.
 †Pods elastically dehiscent. 6. *Chamaecrista*.
 ††Pods indehiscent, or not elastically dehiscent.
 1. Pods terete or subterete or tetragonal, not flattened.
 Pods woody, indehiscent; large trees; perfect stamens 7-10. 7. *Cassia*.
 Pods membranous or coriaceous; vines, shrubs or herbs; perfect stamens mostly 7.
 Pods dehiscent along one side or indehiscent.
 Pods dehiscent along one side; mostly vines; leaflets 4 only, broad. 8. *Chamaefistula*.
 Pods indehiscent or irregularly dehiscent; shrubs; leaflets 6 or more. 9. *Adipera*.
 Pods dehiscent along both sutures, very narrow; herbs. 10. *Emelista*.
 2. Pods flattened, turgid or 4-winged.
 Pods flattened or rarely turgid; herbs, shrubs or trees.
 Pods dehiscent along both sutures.
 Pods elongated, pointed, not crested.
 Pod-valves coriaceous, not impressed between the seeds. 11. *Ditremera*.
 Pod-valves chartaceous, impressed between the seeds. 12. *Peiranisia*.
 Pods short, rounded, crested over the seeds. 13. *Senna*.
 Pods indehiscent; trees. 14. *Isadrina*.
 Pods 4-winged; large shrub. 15. *Herpetica*.
 b. Leaves bipinnate (or some of them simply pinnate).
 * Shrubs or trees.
 Leaf-rachis very short, spine-tipped; pinnae very long, with many leaflets. 16. *Parkinsonia*.

- Leaf-rachis elongated.
 Calyx-segments valvate.
 Calyx-segments imbricated.
 Pod splitting at the middle of the valves.
 Pod dehiscent along the sutures or indehiscent.
 Stamens long-exserted.
 Stamens little longer than the petals.
 Pods straight, dehiscent.
 Pods curled or straight, indehiscent.
- ** Woody vines, mostly prickly.
 Pods swollen; seeds subglobose.
 Pods compressed; seeds compressed.
17. *Delonix*.
 18. *Haematoxylon*.
 19. *Poinciana*.
 20. *Caesalpinia*.
 21. *Libidibia*.
 22. *Guilandina*.
 23. *Biancaea*.

1. **BAUHINIA** [Plum.] L. Sp. Pl. 374. 1753.

Shrubs, trees or some species climbing vines, with broad, simple and entire, or more or less deeply 2-lobed leaves, sometimes cleft into 2 distinct leaflets, caducous stipules, and mostly large flowers in terminal racemes or corymbs. Calyx-tube short or elongated, the limb variously cleft or lobed, sometimes completely closed in the bud. Petals 5, somewhat unequal. Perfect stamens 10 or fewer; filaments distinct, or connate at the base; anthers versatile. Ovary mostly stipitate; style elongated or short, the stigma terminal. Pod linear to oblong, compressed, 2-valved or in some species indehiscent, the valves thin to coriaceous, often twisting after dehiscence. Seeds ovate to orbicular, compressed. [Commemorates Jean Bauhin, 1541-1613, and Caspar Bauhin, 1560-1624, famous Swiss botanists.] About 150 species, of tropical and warm temperate regions of the Old World and the New. Type species: *Bauhinia aculeata* L.

A short stout spine at the base of each petiole; petals elongated-linear. 1. *B. Pauletia*.
 Unarmed shrubs or trees; petals obovate.
 Perfect stamens 10; pods 1-1.5 cm. wide; leaves 3-6 cm. long. 2. *B. tomentosa*.
 Perfect stamen only 1; pods 2.5-3 cm. wide; leaves 8-20 cm. long. 3. *B. monandra*.

1. **Bauhinia Pauletia** Pers. Syn. 1: 455. 1805.

A shrub, or a small tree up to 5 m. high, with long branches, the young twigs villous-pubescent or puberulent, bearing a stout spine 2-4 mm. long at the base of each petiole. Leaves suborbicular, or a little broader than long, 2-lobed to about one-third their length, rounded or subcordate at the base, 6 cm. long or less, pubescent beneath or nearly glabrous, the lobes rounded, their petioles 1-2 cm. long; flowers racemose at the ends of the twigs, leafy-bracted, 6-10 cm. long; pedicels about 1 cm. long; calyx-tube 1.5-2 cm. long; petals and sepals elongated-linear; perfect stamens 5, about as long as the petals; pod linear, compressed, long-stipitate, velvety, 25 cm. long or less, about 13 mm. wide. [*Pauletia aculeata* Cav., not *Bauhinia aculeata* L.; *Bauhinia Krugii* of Stahl, not of Urban.]

Thickets and roadsides at low elevations, southwestern districts of Porto Rico, perhaps introduced:—Trinidad; Mexico to Venezuela. ARAÑA GATO.

2. **Bauhinia tomentosa** L. Sp. Pl. 375. 1753.

A shrub, or small tree, 4 m. high or less, with slender unarmed branches, the young twigs villous or pubescent. Leaves suborbicular, 2-lobed to about one-third their length, thin, subtruncate or subcordate at the base, 3-6 cm. long, villous beneath, the lobes rounded, the slender, pubescent or villous petioles 1.5-3 cm. long; peduncles opposite the leaves, villous, 1-3-flowered; calyx about 2.5 cm. long, closed in bud, puberulent, cleft in anthesis; petals yellow, with dark red bases, broadly obovate, obtuse, nearly equal, about 5 cm. long; stamens 10, unequal in length, all anther-bearing; pod linear, 1-1.5 cm. wide, about 10 cm. long, short-stipitate.

Roadsides, Porto Rico, escaped from cultivation: St. Croix; St. Thomas:—widely established by cultivation in the West Indies. Native of tropical Asia and Africa. MARIPOSA.

3. **Bauhinia monandra** Kurz, Journ. Asiat. Soc. Bengal, 42²: 73. 1873.

Bauhinia Kappleri Sagot, Ann. Sci. Nat. VI. 13: 317. 1882.

Bauhinia Krugii Urban, Ber. Deutsch. Bot. Gesell. 3: 83. 1885.

A large shrub or small tree 5–12 m. high, recorded up to 15 m. high, the young twigs pubescent, the bark gray and smooth. Leaves broadly ovate or suborbicular, 8–20 cm. long, rather thick, 2-lobed to about one-third their length, cordate or truncate at the base, pubescent on the veins beneath, glabrous above, the petiole rather stout, 6 cm. long or less, the pulvinus at the base of the blade conspicuous; flowers large, in short, pubescent racemes; calyx about 2 cm. long, tomentose, split along one side at flowering time, pointed in bud; petals obovate, 4–5 cm. long, long-clawed, rose-colored, one of them carmine-spotted; fertile stamen only 1, about 4 cm. long, the linear anther about 6 mm. long; pod linear, flat, 22 cm. long or less, about 2.5 cm. broad, the valves coriaceous, twisting after dehiscence; seeds about 1 cm. long, flat, black and shining. [*B. porrecta* of Stahl, not of Swartz.]

Roadsides, river-banks and thickets, Porto Ricò, naturalized after cultivation; Vieques; St. Croix; St. Thomas:—widely established in the West Indies; native of south-eastern Asia. Its wood is brown. FLAMBOYAN BLANCO. SEPLINA. NAPOLEON'S PLUME.

Bauhinia Ungala Jacq., recorded by Grisebach as found on St. Thomas, is probably an error in record.

Bauhinia grandiflora Juss., Peruvian, grown from seed by Mr. Thompson at the St. Croix Agricultural Experiment Station, is a shrub with stipular spines, the ovate leaves pubescent beneath, the large, racemose flowers with 10 stamens.

Bauhinia racemosa Vahl, East Indian, also grown from seed at the St. Croix Station, is a shrub with cordate, deeply 2-cleft leaves, the racemose flowers with 3 stamens.

Bauhinia variegata L., Asiatic, occasionally planted for ornament in Porto Rico and the Virgin Islands, is a shrub or small tree, with large nearly glabrous, cordate or subcordate leaves, 2-cleft to about the middle, the large variegated flowers with 5 stamens.

Bauhinia aculeata L. [*B. pubescens* DC.], a South American species, was listed by Krebs as found in St. Thomas, where it may, perhaps, have been planted.

2. **CYNOMETRA** L. Sp. Pl. 382. 1753.

Unarmed trees or shrubs, with evenly pinnate leaves of 1 pair or a few pairs of oblique leathery leaflets, the small flowers in axillary clusters. Calyx-tube very short, its 4 or 5 segments reflexed, imbricated, at least in the bud. Petals 5, nearly equal, or the lower 1 or 2 smaller than the others. Stamens mostly 10, distinct, the filaments glabrous. Ovary short-stipitate or sessile, not adnate to the receptacle; ovules 2; style filiform; stigma terminal. Pod usually oblique or curved, leathery, swollen or terete, at length 2-valved. Seeds without endosperm. [Greek, of no obvious application.] About 30 species, natives of tropical regions of both the Old World and the New. Type species: *Cynometra cauliflora* L.

1. **Cynometra portoricensis** Krug & Urban; Urban, Symb. Ant. 1: 312. 1899.

A tree, sometimes 15 m. high, densely leafy, the young twigs pilose, the wood tough. Petiole only 2.5 mm. long, or less; stipules none; leaflets a single pair, obliquely oblong-obovate, sessile, inequilateral, coriaceous, entire, 1.5–3

cm. long, obtuse or emarginate at the apex, pale green; flowers few, in small sessile axillary clusters subtended by ovate-orbicular striate bracts about 2 mm long; pedicels slender, densely pubescent, 4–6 mm. long; calyx-segments narrowly oblong, about 5 mm. long; petals shorter than the calyx-segments; anthers short-oblong; pod obliquely oblong, 2–3 cm. long, verrucose or at length smooth.

Wooded cliffs, Quebrado del Salto, near Rincon, and on a limestone hill five miles south of Arecibo, Porto Rico.—Hispaniola. OREGANILLO.

3. **STAHLIA** Bello, Anal. Soc. Esp. Hist. Nat. **10**: 255. 1881.

A large unarmed tree with alternate evenly pinnate leaves, the leaflets bearing scattered round black glands beneath, and rather large yellow, perfect flowers in terminal and axillary racemes. Calyx of 5, nearly equal, ovate sepals united at the base. Petals 5, nearly equal, papillose, oval-elliptic, the anterior short-clawed. Stamens 10, distinct, with woolly filaments and versatile anthers. Ovary sessile, not adnate to the receptacle, glabrous; ovules 2; style slender; stigma small, terminal. Pod ovoid, coriaceous, indehiscent, or, perhaps, at length 2-valved. [In honor of Dr. Augustin Stahl, 1842–1917, physician, collector, and author of "Estudios sobre la Flora de Puerto Rico."] A monotypic genus.

1. **Stahlia monosperma** (Tul.) Urban, Symb. Ant. **2**: 285. 1900.

Caesalpinia monosperma Tul. Arch. Mus. Nat. Paris **4**: 148. 1844.

Stahlia maritima Bello, Anal. Soc. Esp. Hist. Nat. **10**: 255. 1881.

A tree, up to 20 m. high, with glabrous twigs and leaves. Petioles 1–2.5 cm. long; leaflets 6–12, mostly opposite, short-stalked, 5–9 cm. long, ovate to ovate-lanceolate, entire or irregularly crenulate, shining above, dull beneath, acute or short-acuminate at the apex, truncate, obtuse or subcordate at the base; racemes 10–15 cm. long, the rachis, bracts, pedicels and calyx sparingly pilose; pedicels stout, recurved, 4–8 mm. long; sepals ovate, obtuse, about 6 mm. long; petals 10–12 mm. long; stamens deflexed, about as long as the petals; pod 5 cm. long or less, about 2.5 cm. wide and 1 cm. thick, purple, coriaceous, 1-seeded.

Coastal woodlands, eastern and southern districts of Porto Rico; Vieques. Endemic. [St. Lucia?]. Its nearly black wood is hard, heavy and strong, valued for furniture; the tree has become scarce. COBANA. POLISANDRO.

4. **HYMENAEA** L. Sp. Pl. 1192. 1753.

Large, unarmed resinous trees, with 2-foliolate, petioled, subcoriaceous leaves, the leaflets oblique, and large white flowers in terminal corymbose panicles. Calyx-segments 4, imbricated, the tube narrowly campanulate. Petals 5, slightly unequal, sessile. Stamens 10, distinct, glabrous; anthers longitudinally dehiscent. Ovary short-stipitate, its stipe adnate to the calyx-tube; style filiform; stigma small, terminal. Pod woody, thick, indehiscent. Seeds few, without endosperm, the testa bony. [Dedicated to Hymen, the god of marriage.] About 8 species of tropical regions, the following typical.

1. **Hymenaea Courbaril** L. Sp. Pl. 1192. 1753.

A tree, up to 20 m. high or higher, the trunk up to 2 m. in diameter, the bark smooth, the stout branches spreading, the twigs and leaves glabrous. Leaflets oblong to oblong-lanceolate, or oblong-ovate, 4–9 cm. long, very inequilateral, sessile, acute or acuminate; panicles several-many-flowered; pedicels short and

stout; calyx-tube (receptacle) about 8 mm. long; the segments oblong, densely puberulent, about 15 mm. long; petals thin, dotted, about as long as the calyx-segments; stamens white, about 3 cm. long; pod oblong, dark brown, compressed, roughened, 5-10 cm. long, few-several-seeded, the seeds oblong, 2-3 cm. long.

Forests and hillsides, mostly in moist or wet districts, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola.—Jamaica; Hispaniola; St. Barts to Trinidad; continental tropical America. Recorded from Cuba. The heavy wood, with specific gravity of nearly 1.00, is red, hard and tough, much used in carpentry and for furniture, wheels and cogs. ALGARROBO. WEST INDIAN LOCUST.

5. **TAMARINDUS** L. Sp. Pl. 34. 1753.

An unarmed tree, with evenly pinnate leaves, numerous and small leaflets, the minute stipules caducous, and yellow, racemose flowers. Calyx-tube turbinate, its 4 segments imbricated. Petals very unequal, the 3 upper ones large, nearly alike, the 2 lower ones minute, scale-like. Perfect stamens 3, monadelphous; anthers longitudinally dehiscent; staminodia minute. Ovary stipitate, few-many-ovuled, the stipe adnate to the calyx-tube; style long; stigma terminal, subcapitate. Pod linear or linear-oblong, curved, little compressed, indehiscent, the thin epicarp crustaceous, the mesocarp pulpy, the coriaceous endocarp septate between the obovate-orbicular seeds. Endosperm none; cotyledons thick. [Latin name of the tree.] A monotypic genus.

1. **Tamarindus indica** L. Sp. Pl. 34. 1753.

Tamarindus occidentalis Gaertn. Fr. & Sem. 2: 310. 1791.

A large tree, sometimes 20 m. high or higher, with a trunk up to 1.5 m. thick, the bark brown, rough, the branches widely spreading, the young twigs slender, puberulent. Leaves 6-12 cm. long, short-petioled, glabrous or nearly so; leaflets 10-18 pairs, thin, reticulate-veined, oblong, 12-25 mm. long, rounded or retuse at the apex, obliquely obtuse or subtruncate at the base; racemes few-several-flowered, mostly terminal and shorter than the leaves; pedicels slender, 6-10 mm. long; calyx 8-10 mm. long; larger petals a little longer than the sepals; stamens a little longer than the petals; pod 5-15 cm. long, about 2 cm. thick, the epicarp brown, scaly, the flesh acid, the brown, shining seeds about 1 cm. broad.

Hillsides and along roads, naturalized after planting, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola.—native of the East Indies; widely naturalized in tropical and subtropical regions. The yellow wood, with specific gravity of about 0.9, is hard and durable, used in construction, for the handles of tools and for furniture; the acid fruit yields a cooling drink. TAMARIND. TAMARINDO.

6. **CHAMAECRISTA** Moench. Meth. 272. 1794.

Herbs or low shrubs, with evenly pinnate leaves, often sensitive to the touch, mostly persistent strongly nerved stipules, and yellow flowers in small axillary clusters or solitary in or above the axils. Calyx-lobes acuminate. Corolla somewhat irregular, some of the five petals smaller than the others. Stamens 5-10, all usually with perfect anthers opening by terminal pores. Pods linear, flat, more or less elastically dehiscent, the valves twisting. [Greek, low crest.] About 100 species, widely distributed in temperate and tropical regions. Type species *Chamaecrista nictitans* (L.) Moench.

- A. Leaflets a single pair, obliquely obovate; peduncles long, filiform. 1. *C. diphylla*.
 B. Leaflets several or many pairs; peduncles short.
 1. Flowers 2-3 cm. broad.
 Leaflets membranous, finely veined.
 Pod 4-6 cm. long, 3-5 cm. wide; leaflets 8-12 mm. long. 2. *C. Swartzii*

- Pod 2.5 cm. long or less, 2–2.5 mm. wide; leaflets 4–6 mm. long.
 Leaflets thick or coriaceous; strongly veined.
 Foliage glabrous or merely puberulent.
 Leaflets glabrous, shining, callous-margined.
 Leaflets granular-puberulent, dull, not margined.
 Foliage densely pubescent.
2. Flower 8–15 mm. broad.
 Petiolar gland small, stalked.
 Petiolar glands large, sessile.
3. *C. mirabilis*.
 4. *C. portoricensis*.
 5. *C. granulata*.
 6. *C. grammica*.
 7. *C. Chamaecrista*.
 8. *C. aeschynomene*.

1. **Chamaecrista diphylla** (L.) Greene, *Pittonia* **4**: 28. 1890.

Cassia diphylla L. Sp. Pl. 376. 1753.

Herbaceous, glabrous, or the petioles and stipules ciliate, 5 dm. high or less; often much-branched, the branches spreading or diffuse. Stipules lanceolate; 5–8 mm. long, acuminate and subulate-tipped, cordate at base, striate-nerved; longer than the petiole; petiolar glands 1 or 2, nearly sessile; leaflets a single pair, obliquely obovate, rounded at the apex, 1–3 cm. long, flabellate-nerved, the rachis prolonged between them as a short sharp tip; peduncles solitary in the axils, filiform, longer than the leaves, 1-flowered; sepals scarious, finely many-nerved, 6–10 mm. long; petals about as long as the sepals; pod linear, pubescent with long hairs, 3–6 cm. long, 3–6 mm. wide; seeds transversely oblique, narrowed at base.

Grassy banks, sandy fields and cliffs, at lower elevations, Porto Rico:—Cuba; Hispaniola; Mexico to Brazil. Recorded from St. Kitts and St. Vincent. HEDIONDILLA. ZARZABACO.

2. **Chamaecrista Swartzii** (Wickstr.) Britton, *Bull. Torr. Club* **44**: 9. 1917.

Cassia Swartzii Wickstr. *Vetensk. Acad. Handl.* **1825**: 430. 1826.

Chamaecrista complexa Pollard, *Field Mus. Bot.* **2**: 47. 1900.

Cassia glandulosa Swartzii Macbride, *Contr. Gray Herb.* **II. 59**: 26. 1919.

Shrubby, more or less pubescent, 1.5 m. high or less, the branches slender. Stipules triangular-lanceolate, long-acuminate, striate-nerved, 4–8 mm. long. Petiole 4–8 mm. long, bearing a stipitate, sometimes long-stipitate gland, rarely 2; leaflets 15–25 pairs, linear-oblong to oblong-obovate, thin, 8–12 mm. long, obtuse and cuspidate at the apex, oblique at the base, the midvein nearly central, the lateral veins many, ascending; peduncles 1–3 in the axils, mostly longer than the petioles, 1-flowered; sepals membranous, scarcely nerved, 10–12 mm. long; petals about twice as long as the sepals, one of them much larger than the other four; pod linear, loosely pubescent or glabrate, 4–6 cm. long, 3–5 mm. wide. [*Cassia glandulosa* of West, of Krebs, of Stahl and of Urban, not of Linnaeus; ? *Cassia riparia* of Krebs; *Cassia glandulosa stricta* and *ramosa* of Eggers; *Chamaecrista glandulosa* and *C. glandulosa ramosa* of Millspaugh.]

Banks, hillsides and thickets at lower and middle elevations, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Hispaniola; St. Barts to Grenada. TAMARINDILLO.

3. **Chamaecrista mirabilis** Pollard, *Proc. Biol. Soc. Wash.* **15**: 19. 1902.

Cassia mirabilis Urban, *Symb. Ant.* **4**: 276. 1905.

Shrubby, low, prostrate, ascending or erect, 3–6 dm. long, glabrous, or finely pubescent above when young, the branches slender. Stipules linear-subulate, striate, 3–6 mm. long; petioles short, bearing 1–3 stalked discoid glands; leaflets 3–17 pairs, linear, 4–6 mm. long, cuspidate, thin, the midvein nearly central, the lateral veins numerous; peduncles mostly solitary in the axils, nearly filiform, sometimes as long as the smaller leaves, 1-flowered; sepals thin, 6–9 mm. long; petals longer than the sepals, one of them much larger than the other four; pod in ar, sparingly pubescent, 2–2.5 cm. long, 2–2.5 mm. wide.

In sand, northern coastal plain of Porto Rico. Endemic.

4. **Chamaecrista portoricensis** (Urban) Cook & Collins, Contr. U. S. Nat. Herb. 8: 113. 1903.

Cassia portoricensis Urban, Symb. Ant. 1: 317. 1899.

Cassia portoricensis callosa Urban, Symb. Ant. 1: 317. 1899.

Shrubby, usually bushy-branched, 6 dm. high or less, the branches short-pubescent. Stipules lanceolate, long-acuminate, 3-8 mm. long; petioles about as long as the stipules or shorter; leaflets 3-11 pairs, coriaceous, oblong or obovate-oblong, 6-15 mm. long, glabrous, shining, callous-margined, obtuse or acute, mucronate, strongly veined; petiolar gland with a short, stout stipe; peduncles 1-2-flowered, shorter than the leaves; sepals lanceolate or ovate-lanceolate, 6-8 mm. long, acuminate, thin, not striate-nerved; petals obovate, 10-15 mm. long; pod linear, short-pilose, 6 cm. long or less, 4-6 mm. wide.

Hillsides and serpentine slopes, western and southwestern districts of Porto Rico at lower and middle elevations. Endemic. RETAMA.

5. **Chamaecrista granulata** (Urban) Britton, Ann. Mo. Bot. Gard. 2: 41. 1915.

Cassia portoricensis granulata Urban, Symb. Ant. 1: 318. 1899.

Cassia granulata Macbride, Contr. Gray Herb. II. 59: 26. 1919.

Shrubby, often much branched, 1 m. high or less, the branches rather densely short-pubescent. Stipules lanceolate, acuminate, 3-5 mm. long; petioles about as long as the stipules or shorter, bearing a stipitate gland; leaflets 4-7 pairs, subcoriaceous, oblong or obovate, 6-12 mm. long, granular-puberulent, dull, obtuse, mucronate, not margined; peduncles 1-flowered, shorter than the leaves; sepals lanceolate, acuminate, 7-8 mm. long; petals obovate, about twice as long as the sepals; pod linear, loosely pubescent, 3-5 cm. long, 4-5 mm. wide.

Sand-dunes and limestone thickets near the coast, dry southwestern districts of Porto Rico; Mona; Muertos. Endemic.

6. **Chamaecrista grammica** (Spreng.) Pollard, Field Mus. Bot. 2: 47. 1900.

Cassia grammica Spreng, Neue Entd. 3: 55. 1822.

Shrubby, 6 dm. high or less, densely pubescent. Petiole short, bearing a stalked gland; leaflets 3-8 pairs, oblong to obovate, 6-12 mm. long, dull, acutish or obtuse, mucronate, their margins slightly thickened; stipules lanceolate, acuminate, about 5 mm. long; peduncles 1-flowered, shorter than the leaves or nearly as long; sepals lanceolate, pilose, about 8 mm. long; petals nearly twice as long as the sepals; pod linear, about 3 cm. long and 3 mm. wide, pubescent.

Coastal limestone hills near Ponce, Porto Rico; Vieques; Little St. James Island;—Cuba; Hispaniola. Similar to the preceding species, but densely pubescent.

7. **Chamaecrista Chamaecrista** (L.) Britton, Bull. Torr. Club 44: 12. 1917.

Cassia Chamaecrista L. Sp. Pl. 379. 1753.

Cassia diffusa DC. Mem. Soc. Phys. Genève 2: 130. 1824.

Chamaecrista diffusa Britton, Ann. Mo. Bot. Gard. 2: 41. 1915.

Low, slightly woody, diffusely branched, the branches slender, spreading or prostrate, pubescent or glabrate, sometimes 2-3 dm. long. Stipules lanceolate, acuminate, strongly few-veined, 3-6 mm. long; petioles about as long as the stipules, bearing a solitary, small, slender-stalked gland; leaflet 5-16 pairs, linear, 5-7 mm. long, inequilateral, thin, finely pubescent or glabrate, mucronate, the midvein eccentric; peduncles 1-flowered, not longer than the petioles; sepals thin, lanceolate, 3-4 mm. long; petals obovate, slightly longer than the sepals; stamens 5-7; pod linear, loosely pubescent or glabrate, 1.5-3 cm. long, 3 mm. wide. [*Cassia nictitans* of Krebs, of Eggers, of Urban and of Millspaugh, not of Linnaeus.]

Sand dunes and sandy soil along the coasts, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan.—West Indies, south to Grenada, Margarita and Curaçao.

8. *Chamaecrista aeschinomene* (DC.) Greene, *Pittonia* 4: 32. 1899.

Cassia aeschinomene DC.; Collad. Cass. 127. 1816.

Cassia mimosoides aeschinomene Benth. Trans. Linn. Soc. 27: 579. 1871.

Chamaecrista Millspaughii Pollard, Field Mus. Bot. 2: 47. 1900.

(?) *Cassia exunguis* Urban, Repert. 15: 312. 1918.

Slightly woody, erect or diffuse, branched or nearly simple, 1 m. high or less, the branches more or less pubescent, or glabrous. Stipules lanceolate or linear-lanceolate, 6–12 mm. long, striate-nerved, long-acuminate; petioles as long as the stipules or shorter, bearing a single, large, sessile, scutellate gland; leaflets 7–25 pairs, linear, 8–15 mm. long, thin, glabrous or pubescent, acute or obtuse, and mucronate, rather strongly veined; peduncles mostly 1-flowered, short; sepals lanceolate, acute or acuminate, glabrous or pubescent, 5–7 mm. long; petals obovate, a little longer than the sepals; stamens 5–7; pod linear, pubescent or nearly glabrous, 3–5 cm. long, 2.5–4 mm. wide. [*Cassia nictitans* of Urban in part, not of Linnaeus; ? *C. hecatophylla* of Krebs.]

Sand dunes, banks and hillsides at lower and middle elevations, Porto Rico:—Vieques; Desecheo:—Jamaica; Cuba; Hispaniola.

Chamaecrista serpens (L.) Greene, a species of Jamaica, Cuba and continental America, was recorded by Krebs from St. Thomas, presumably in error [*Cassia prostrata* H. & B.].

7. **CASSIA** [Tourn.] L. Sp. Pl. 376. 1753.

Mostly trees with evenly pinnate leaves and yellow or white flowers in drooping racemes. Sepals nearly equal, obtuse. Corolla nearly regular; petals 5, spreading, nearly equal, imbricated, clawed. Stamens usually 10, the 3 lower ones with elongated filaments; anthers of the lower stamens larger than the others. Pods woody, indehiscent, elongated, pendulous, septate. Seeds numerous, transverse. [Ancient name.] About 20 species, of wide distribution in warm and temperate regions. Type species: *Cassia Fistula* L.

Leaflets 4–8 pairs, ovate, glabrous, 7–20 cm. long.

Leaflets 7–20 pairs, oblong, pubescent, 6 cm. long or less.

1. *C. Fistula*.

2. *C. grandis*.

1. *Cassia fistula* L. Sp. Pl. 377. 1753.

A tree, up to 20 m. tall, the trunk up to 7 dm. in diameter, the twigs glabrous or very nearly so. Stipules linear-lanceolate, small, fugacious. Leaves often 4 dm. long or longer, the stout, eglandular petiole 10 cm. long or less; leaflets 4–8 pairs, short-stalked, chartaceous, ovate to ovate-oblong or ovate-lanceolate, 7–20 cm. long, acutish or bluntly acuminate at the apex, obtuse or narrowed at the base, finely pinnately veined with a prominent midvein, glabrous, bright green and somewhat shining above, paler green beneath; racemes drooping, 3–8 dm. long; pedicels very slender, 2–5 cm. long; sepals oval or oblong, obtuse, puberulent, 6–10 mm. long; petals bright yellow, oblong, obtuse, 2–3 cm. long; pods cylindrical, drooping, terete, nearly black, glabrous, 6 dm. long or less, about 2 cm. thick, pulpy within around the flat horizontal seeds.

Roadsides, pastures and hillsides, Porto Rico, escaped from cultivation and naturalized; Vieques; St. Croix:—widely planted and naturalized in the West Indies. Native of tropical Asia. The purgative pulp of the fruit yields the drug. The wood is reddish, hard, strong and durable, with specific gravity of about 0.93. **CANA FISTULA**.

2. *Cassia grandis* L.f. Suppl. 230. 1781.

Cassia brasiliiana Lam. Encycl. 1: 649. 1783.

A tree, up to 20 m. high, the young twigs pubescent. Stipules very small, linear, fugacious. Leaves about 3 dm. long or less, densely finely pubescent all over; petiole 2–6 cm. long, eglandular; leaflets 8–20 pairs, oblong, nearly sessile,

obtuse at both ends, or the upper ones narrowed at the base, 3-5 cm. long; racemes lateral or axillary, drooping, pubescent, 1-2 dm. long; pedicels 1-2 cm. long; sepals ovate-oblong, obtuse, canescent, 6-8 mm. long; petals orbicular, reddish or purplish, about 12 mm. broad; pod compressed-cylindric, indehiscent, transversely rugulose, septate between the seeds, 9 dm. long or less.

Hillsides in dry parts of the southwestern districts of Porto Rico; sometimes planted; naturalized on St. Thomas and St. Croix:—Hispaniola; Cuba; Jamaica; tropical continental America; planted in other West Indian islands. The red-brown wood, used in cabinet work and construction, is hard, strong and durable, with specific gravity of about 0.75. CAÑA FISTULA CIMARRON.

Cassia nodosa Hamilt., a tree of tropical Asia, has been experimentally planted for forestry purposes in Porto Rico. It has large leaves, of 6-10 pairs of leaflets, the rose-colored flowers in lateral racemes.

Cassia siamea Lam. (*C. florida* Vahl), East Indian, is planted for shade and ornament in the Virgin Islands, and is there sometimes spontaneous from seed. It is a rapidly growing tree of large size, the leaves with 6-10 pairs of oval-oblong, obtuse glabrous leaflets 4-6 cm. long, the yellow flowers in large panicles, the narrow flat elongated stiff, slightly curved pod at length dehiscent, the seeds transverse. It belongs with a group of Old World species, not strictly congeneric with the true *Cassias*.

Cassia triflora Vahl, collected on St. Croix by Rohr, is noted by Eggers as "a doubtful species," not the same as *Cassia triflora* Jacq., a prior name of a *Chamaecrista*.

8. CHAMAEFISTULA G. Don, Gen. Syst. 2: 451. 1832.

Woody vines, rarely shrub-like, the leaves with 2 pairs of broad leaflets, the large yellow flowers in terminal panicles or racemes. Sepals nearly equal, mostly obtuse. Petals 5, nearly equal, imbricated. Perfect stamens usually 7; staminodia usually 3; anthers all nearly alike, linear-oblong, opening by terminal pores. Pods mostly elongated, terete, dehiscent along the inner suture, somewhat coriaceous, the transverse seeds compressed, the pulp glutinous. [Greek, a low *Cassia*.] About 30 species of tropical America. Type species: *Cassia bacillaris* L.f.

A linear gland between each pair of leaflets.
An ovoid gland between the lower pair of leaflets.

1. *C. antillana*.
2. *C. bacillaris*.

1. *Chamaefistula antillana* Britton and Rose, sp. nov.

A vine, 8 m. long or more, the young twigs and inflorescence appressed-puberulent or glabrate, the branches 5-angled. Leaves 1-2 dm. long; petiole slender, 2-4 cm. long, eglandular; leaflets 2 pairs, with a linear gland between each pair, obliquely ovate, 3-10 cm. long, short-stalked, chartaceous, acute or acuminate at the apex, mostly obtuse at the base, shining above, glabrous on both sides or somewhat pubescent beneath; panicles several-many-flowered; pedicels slender, 2 cm. long or less; sepals oblong or ovate, obtuse, puberulent, 4-6 mm. long; petals bright yellow, orbicular-ovate, veiny, 1-2 cm. long; pod linear, turgid when mature, glabrous, 8-18 cm. long, 1-1.5 cm. thick, ultimately dehiscent along one suture; seeds obliquely oval, compressed, black, viscid, shining, 5-6 mm. long. [Referred by de Candolle and by Krebs to *Cassia viminea* L.; by Bello and by Stahl to *Cassia bacillaris* L.f., and by Urban to *Cassia quinqueangulata* L. C. Rich.]

Thickets and woodlands at lower and middle elevations in moist districts, Porto Rico, ascending into the Luquillo Mountains; St. Thomas; Tortola:—Type from St. Thomas (Britton and Marble, 400). HEDIONDILLA.

2. **Chamaefistula bacillaris** (L.f.) G. Don, Gen. Syst. 2: 451. 1832.

Cassia bacillaris L.f. Suppl. 231. 1781.

A vine, similar to the preceding species, the young shoots and inflorescence puberulent, the foliage glabrous or puberulent. Leaves 2.5 dm. long or less; petiole 2–5 cm. long; leaflets 2 pairs, with a short blunt ovoid gland between the lower pair, chartaceous, short-stalked, obliquely ovate, larger than those of *C. antillana*, 5–15 cm. long, the apex acuminate, the base rounded; panicles broad, several-flowered; pedicels slender, 1–3 cm. long; sepals obtuse, 6–7 mm. long; petals yellow, rounded, about 2 cm. long; pod linear, 2 dm. long or less; seeds compressed.

Sierra de Luquillo, Porto Rico (Eggers, 1395):—St. Vincent; Tobago; Trinidad; continental tropical America.

Chamaefistula macrophylla (Kunth) G. Don, a species of northern South America, was recorded by Krebs from St. Thomas, evidently in error.

9. **ADIPERA** Raf. Sylva Tell. 129. 1838.

Shrubs, the branches sometimes elongated and vine-like, the leaves with 3 or more pairs of leaflets, the rather large yellow flowers corymbose or racemose. Sepals 5, unequal. Petals nearly equal. Perfect stamens usually 7; staminodes usually 3; anthers narrowly oblong, opening by terminal pores. Pods mostly elongated, terete or subterete, subcoriaceous or membranous, indehiscent or irregularly bursting. Seeds transverse, compressed. [Greek, referring to the unlike stamens and staminodes.] About 8 species, of tropical America. Type species: *Cassia Herbertiana* Lindl.

Leaflets oblong to obovate, 1–4 cm. long, obtuse.

Pedicels short, 3–8 mm. long.

Pedicels slender, 1–3 cm. long.

Leaflets ovate, 4–8 cm. long, acute.

1. *A. bicapsularis*.

2. *A. Stahlii*.

3. *A. laevigata*.

1. **Adipera bicapsularis** (L.) Britton & Rose.

Cassia bicapsularis L. Sp. Pl. 376. 1753.

A shrub, up to 3.5 m. high, glabrous, or nearly so, throughout, the branches slender, sometimes vine-like. Stipules small, early deciduous; leaves 5–9 cm. long, slightly fleshy, bearing an oblong gland narrowed toward the base, between the lowest pair of leaflets; leaflets 3–5 pairs, 1–4 cm. long, short-stalked, rounded at the apex, the upper pair obovate, narrowed at the base, the others oblong to suborbicular, rounded at both ends; racemes axillary, few-flowered, as long as the leaves or longer; pedicels 3–8 mm. long; sepals oblong, obtuse, faintly veined, 8–12 mm. long; petals yellow, veiny, oblong-obovate, somewhat longer than the sepals; pod turgid, subterete, 8–15 cm. long, about 1 cm. thick; seeds leucicular, obliquely oval, brown, shining, about 5 mm. long, horizontal.

Thickets and hillsides at lower elevations, Porto Rico, mostly in dry districts; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—West Indies and tropical continental America; introduced into the Old World tropics. HOJA DE SEN. SEN DE PAIS. STYVER-BUSH. CHRISTMAS-BUSH.

2. **Adipera Stahlii** (Urban) Britton & Rose.

Cassia Stahlii Urban, Symb. Ant. 1: 316. 1899.

A shrub, 4 m. high or less, nearly glabrous throughout, or the inflorescence pubescent. Stipules linear-subulate, 1 cm. long or less, deciduous; leaves 5–8 cm. long, with an oblong-linear gland between the lowest pair of leaflets, or between all the pairs; leaflets 3–5 pairs, oblong, oval, or the lower suborbicular, rounded at each end, thin, 1–3 cm. long, the lower smaller than the upper; racemes axillary and terminal, several-many-flowered, bracts membranous, 6–10 mm.

long, usually deciduous; pedicels slender, 1–3 cm. long; sepals ovate or orbicular-ovate, 6–7 mm. long; petals obliquely obovate or suborbicular, nearly twice as long as the sepals, purplish-veined; pod turgid, subterete, 15 cm. long or less, 1–1.5 cm. thick. [*C. laevigata* of Bello, not of Linnaeus.]

Woodlands and stream-banks at middle altitudes in wet districts, Porto Rico. Endemic. VELAMUERTO.

3. **Adipera laevigata** (Willd.) Britton & Rose.

Cassia laevigata Willd. Enum. 441. 1809.

A glabrous shrub, 3 m. high or less. Stipules linear, about 3 mm. long, deciduous; leaves 1–2 dm. long, bearing oblong-linear glands between each pair of leaflets; leaflets 3 or 4 pairs, ovate to ovate-oblong or ovate-lanceolate, 4–8 cm. long, thin, short-stalked, acuminate at the apex, obtuse at the base; racemes axillary and terminal, mostly long-peduncled and shorter than the leaves, few-several-flowered; bracts linear-lanceolate, 1 cm. long or less, deciduous; pedicels slender, 5–15 mm. long; sepals oblong, obtuse or acutish, 6–8 mm. long, veiny; petals obovate, yellow, about twice as long as the sepals; pod turgid, subterete, 6–8 cm. long, about 1 cm. thick.

Thickets and river-valleys at middle altitudes in moist districts, Porto Rico;—Jamaica; continental tropical America; introduced into the Old World tropics. HEDIONDA MACHO.

10. **EMELISTA** Raf. Sylva Tell. 127. 1838.

Herbs, the leaves with several pairs of broad leaflets, the rather large flowers axillary, in few-flowered racemes, or solitary. Sepals obtuse. Petals nearly equal. Perfect stamens 6 or 7; staminodes 3. Pods narrowly linear, tetragonal or subterete, dehiscent along both sutures. Seeds longitudinal. [Derivation not cited.] A few species, of tropical and subtropical America. Type species: *Cassia obtusifolia* L.

1. **Emelista tora** (L.) Britton & Rose.

Cassia tora L. Sp. Pl. 376. 1753.

Cassia obtusifolia L. Sp. Pl. 377. 1753.

Annual, herbaceous, glabrous, or sparingly pubescent, 1 m. high or less. Stipules linear-subulate, sometimes ciliate, 1–1.5 cm. long, at length deciduous; leaves 8–15 cm. long; petioles 1–4 cm. long, a linear gland between or above the lower pair of leaflets; leaflets 2–4 pairs, very short-stalked, obovate, thin, 1.5–5 cm. long, obtuse and often mucronate at the apex; flowers axillary, few or solitary; peduncles commonly shorter than the petioles; sepals 5–8 mm. long, obtuse, often ciliate; petals yellow, about twice as long as the sepals; pods narrowly linear, strongly curved, 2 dm. long or less, 3–5 mm. wide, tetragonal-compressed, dehiscent; seeds oblong, compressed, shining, about 5 mm. long, parallel with the valves of the pod.

Hillsides, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Vieques; St. Croix; St. Thomas; Tortola;—southeastern United States; West Indies; tropical continental America; Old World tropics. DORMIDERA.

11. **DITREMEXA** Raf. Sylva Tell. 127. 1838.

Herbs, shrubs or trees, the leaves various, the flowers mostly in axillary or lateral clusters. Sepals mostly obtuse. Petals nearly equal. Perfect stamens usually 7, with 3 staminodes. Pods flattened or rarely turgid, dehiscent along both sutures, the valves coriaceous or subcoriaceous. Seeds transverse or oblique. [Derivation not cited.] Species 100 or more, widely distributed in both temperate and tropical regions. Type species: *Cassia occidentalis* L.

Herbaceous species; pods flat.

Hirsute; pods only about 5 mm. wide.

Glabrous or nearly so; pods 6-9 mm. wide.
Shrub; pods turgid.

1. *D. hirsuta*.
2. *D. occidentalis*.
3. *D. Sophera*.

1. *Ditremexa hirsuta* (L.) Britton & Rose.

Cassia hirsuta L. Sp. Pl. 378. 1753.

Perennial, herbaceous, hirsute, malodorous, 0.5-1.5 m. high. Stipules linear, acuminate, 1 cm. long or less; leaves up to 3 dm. long; petioles 3-8 cm. long, bearing a stout, oblong-cylindric gland near the base; leaflets 3-5 pairs, very short-stalked, ovate to ovate-lanceolate, 4-7 cm. long, acute or acuminate, the base narrowed or obtuse; flowers yellow, in short axillary racemes; peduncles much shorter than the petioles; bracts short, deciduous; sepals oblong, obtuse, about 9 mm. long, hirsute; petals about twice as long as the sepals; pods linear, hirsute, somewhat curved, compressed, 12-20 cm. long, about 5 mm. wide.

Recorded by Eggers as found at Sugar Estate in St. Thomas prior to 1876:—Jamaica; Guadeloupe; Martinique; Trinidad; continental tropical America.

2. *Ditremexa occidentalis* (L.) Britton & Rose.

Cassia occidentalis L. Sp. Pl. 377. 1753.

Annual or perennial, herbaceous or slightly woody, erect, 2 m. high or less, glabrous, or very sparingly pubescent. Stipules linear-lanceolate, acuminate, 4-6 mm. long, caducous; leaves 1-2 dm. long; petiole 3-5 dm. long, bearing a large sessile capitate gland near the base; leaflets 4-6 pairs, very short-stalked, thin, ovate to ovate-lanceolate, acute or acuminate at the apex, rounded at the base, 7 cm. long or less; racemes axillary, short-peduncled, few-flowered; bracts lanceolate, acuminate, 1-1.5 cm. long, caducous; sepals 6-9 mm. long; petals yellow, fading whitish, nearly twice as long as the sepals; pods linear, flat or compressed, usually a little curved, 6-12 cm. long, 6-9 mm. wide, dehiscent, the valves chartaceous, their margins thickened; seeds compressed, obovoid, brown, dull, about 4 mm. long, parallel to the dissepiments of the pod.

Banks, hillsides, waste and cultivated grounds at lower and middle elevations, Porto Rico; Desecheo; Mona; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—West Indies; southeastern United States and Mexico; continental tropical America and Old World tropics. HEDIONDA. COFFEE SENNA. STINKING WEED.

3. *Ditremexa Sophera* (L.) Britton & Rose.

Cassia Sophera L. Sp. Pl. 379. 1753.

A shrub, 1-2.3 m. high, nearly glabrous throughout, with slender branches. Leaves 1-1.5 dm. long; petiole 1-3 cm. long, bearing a sessile round gland near the base; leaflets 5-10 pairs, ciliate, at least when young, membranous, lanceolate to oblong-lanceolate, acute or acuminate at the apex, mostly rounded at the base; flowers in short racemes in the upper axils; pedicels 8-15 mm. long; calyx about 8 mm. long; petals about twice as long as the sepals; pod linear, straight, turgid or subterete, 5-10 cm. long, 7-9 mm. thick, pointed, glabrous; seeds dull, brown, 4-5 mm. long.

Roadside, near the settlement, Anegada:—Bahamas; West Indies; continental tropical America and Old World tropics. Perhaps this is the plant recorded by Krebs from St. Thomas as *Cassia frutescens* Mill.

Ditremexa ligustrina (L.) Britton & Rose [*Cassia ligustrina* L.; *C. occidentalis glabra* Stahl] of Florida, Bahamas, Jamaica, Cuba and Hispaniola, occasionally planted for ornament in Porto Rico gardens, is a glabrous perennial 1-2 m. high, the leaves with 6 or 8 pairs of lanceolate acute leaflets 3-6 cm. long, the yellow flowers paniced, the flat, somewhat curved pods 7-15 cm. long, 6-10 mm. wide. PRIVET SENNA.

12. **PEIRANISIA** Raf., Sylva Tell. 127. 1838.

Trees or shrubs, the leaves often fasciated at the nodes of the branches, with several or many pairs of small membranous leaflets, with or without glands on the petiole or rachis, the large yellow flowers slender-pedicelled in small clusters. Petals nearly alike. Perfect stamens usually 7, two or three of the lower ones beaked, 1-porose; staminodes usually 3. Pod flattened, elongated, narrow, dehiscent along both sutures, tipped or pointed, the valves chartaceous, impressed between the transverse seeds; their margins thickened. [Derivation not cited.] About 25 species, of tropical America. Type species *Cassia aversifolia* Hook.

1. **Peirania polyphylla** (Jacq.) Britton & Rose.

Cassia polyphylla Jacq. Coll. 4: 104. 1790.

Usually a shrub 3 m. high or less, or a tree up to 4 m., but recorded as sometimes becoming a tree up to 15 m. high, the young twigs loosely and sparingly pubescent, the branches slender. Leaves 2-6 cm. long, pubescent when young, nearly sessile, fasciated at the nodes; stipules subulate, 2-3 mm. long; leaflets very small, 5-15 pairs, nearly sessile, obovate, oblong-obovate, or oblong, 4-10 mm. long, obtuse, retuse or mucronulate at the apex, 3-nerved and pinnately few-veined, somewhat pubescent when young, becoming glabrous; peduncles axillary, slender, shorter than the leaves, 1-2-flowered; flowers showy; sepals oval, unequal, obtuse; petals obovate, short-clawed, bright yellow, about 1.5 cm. long; pod linear, nearly straight, 8-15 cm. long, 6-8 mm. wide, stipitate, short-tipped, drooping, dehiscent, impressed between the seeds, the chartaceous valves brown, becoming black, shining; seeds compressed. [*Cassia biflora angustisiliqua* of Eggers; *C. biflora* of Bello and of Stahl, not of Linnaeus.]

Hillsides and thickets at low and middle elevations, Porto Rico, mostly in dry parts of the southern and southwestern districts; St. Thomas; St. Croix; Anegada;—Hispaniola. Elegant when in bloom; sometimes planted for ornament. RETAMA PRIETA.

13. **SENNA** [Tourn.] Mill. Gard. Diet. Abr. ed. 4. 1754.

Herbs with eglandular leaves with 3 to 8 pairs of broad and thin leaflets, the flowers in axillary racemes, the membranous bracts caducous. Petals yellow, rather large. Perfect stamens usually 7, with 3 staminodes. Pod thin, flat, short, broad, curved, obtuse or rounded, dehiscent along both sutures, crested over the seeds. [The name is said to be of Arabic origin.] A few species of the Old World tropics. Type species: *Cassia Senna* L.

1. **Senna obovata** (Collad.) Batka, Mon. Senn. 32, 46. 1866.

Cassia obovata Collad. Hist. Cass. 92. 1816.

Glabrous, glaucous, erect, 0.5-1.2 m. high. Stipules lanceolate, 4-6 mm. long, acuminate; leaves 8-15 cm. long; petioles slender, 2-5 cm. long; leaflets 3-7 pairs, obovate or oblong-obovate, 1-4 cm. long, nearly sessile, the apex rounded and mucronulate, the base narrowed; racemes mostly as long as the leaves or longer, several-many-flowered, slender-peduncled; bracts 4-7 mm. long; petals bright yellow, nearly alike, about twice as long as the sepals; pod oblong, very flat, rounded at both ends, 3-6 cm. long, about 1.5 cm. wide.

Naturalized on St. Thomas (according to Krebs and to Eggers);—Jamaica; Hispaniola; St. Martin; St. Eustatius; Margarita; Aruba; Curaçao; Venezuela. Native of the Old World tropics. SENNA. PORT ROYAL SENNA.

Senna angustifolia (Vahl) Batka, was planted on St. Croix, according to West. It is a species of tropical Africa, not otherwise known in America. [*Cassia angustifolia* Vahl.]

14. **ISANDRINA** Raf. *Sylva Tell.* 126. 1838.

Trees or shrubs, the glandless leaves with broad leaflets, the flowers axillary or lateral, racemose or corymbose-paniculate. Petals nearly alike. Perfect stamens 7, with 3 staminodes. Pods flattened, narrow, elongated, drooping, coriaceous, indehiscent, their margins somewhat thickened. Seeds flattened. [Derivation not cited.] A few species of tropical America. Type species *Cassia emarginata* L.

1. **Isandrina emarginata** (L.) Britton & Rose.

Cassia emarginata L. Sp. Pl. 376. 1753.

Cassia elliptica H. B. K. Nov. Gen. 6: 356. 1823.

Isandrina arborescens Raf. *Sylva Tell.* 126. 1838.

A tree, up to 15 m. high, or sometimes shrubby, the young twigs densely pubescent, the branches rather stout. Leaves 2 dm. long or less, pubescent; petioles stout, eglandular, 2–5 cm. long; leaflets 2–5 pairs, broadly oblong or oval, short-stalked, obtuse at each end, or acutish, mucronulate or emarginate at the apex, 2–10 cm. long, pinnately veined; stipules setaceous, 2–4 mm. long, deciduous; racemes as long as the leaves or shorter, axillary, peduncled, several-many-flowered; sepals oblong, obtuse or acutish, 5–7 mm. long; petals 2–3 times as long as the sepals; pod linear, glabrous, straight or nearly so, compressed, 3 dm. long or less, 8–12 mm. wide. [*Cassia glandulosa* of Cook and Collins.]

Hillsides and woodlands at lower elevations in dry parts of the south-central districts of Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Mexico to Venezuela.

15. **HERPETICA** Raf. *Sylva Tell.* 123. 1838.

A large shrub, the large glandless leaves with broad obtuse leaflets, the showy yellow flowers racemose, terminal or in the upper axils, large-bracted. Petals nearly alike. Perfect stamens 7. Staminodes 3. Pods elongated, chartaceous, longitudinally 4-winged, longitudinally dehiscent. Seeds flat, transverse. [Derivation not cited.] A monotypic genus.

1. **Herpetica alata** Raf. *Sylva Tell.* 123. 1838.

Cassia alata L. Sp. Pl. 378. 1753.

A shrub, 4 m. high or less, the young foliage puberulent, the branches stout. Leaves large, 3–10 dm. long; stipules lanceolate, acuminate, 1–2 cm. long; petioles stout, 1.5–4 cm. long, glandless; rachis angular, puberulent, flat above; leaflets 6–12 pairs, very short-stalked, chartaceous, broadly oblong, 5–17 cm. long, elliptic, the upper pairs obovate and often much larger than the lower, all obtuse at both ends, somewhat inequilateral, distinctly pinnately veined; racemes large, elongated; pedicels very short; bracts ovate-orbicular, obtuse, 1–1.5 cm. long, caducous; sepals about 1 cm. long; petals obovate, clawed, 2 cm. long or less; pod linear, straight or nearly so, many-septate, 10–15 cm. long, about 1.5 cm. wide, dehiscent, the valves chartaceous, nearly black, shining, each with a broad, crenulate, longitudinal wing; seeds parallel with the dissepiments, 4-sided, compressed, brown, about 5 mm. long.

Hillsides, river-banks and waste grounds, Porto Rico, at lower and middle elevations; Vieques; Culebra; St. Croix; St. Thomas; St. Jan:—West Indies (except Bahamas); continental tropical America; introduced into the Old World tropics. TALANTALA. CARRION CROW. RINGWORM TREE.

16. **PARKINSONIA** L. Sp. Pl. 375. 1753.

A spiny shrub or small tree, with nearly sessile bipinnate leaves, the common rachis very short and spinulose-tipped, the 1 or 2 pairs of pinnae elongated, with

several-many small leaflets, the showy yellow flowers in racemes. Calyx-tube short, the 5 narrow segments nearly equal. Petals 5, spreading, nearly equal. Stamens 10, distinct; filaments villous at the base; anthers all alike, versatile, the sacs longitudinally dehiscent. Ovary short-stipitate, many-ovuled; style nearly filiform; stigma small and terminal. Pod linear, coriaceous, torulose, striate-veined, 2-valved. Seeds oblong, longitudinally placed, hard; endosperm horny; cotyledons flat. [Commemorates John Parkinson, an English botanist, herbalist to James I, who died in 1750.] A monotypic genus, or, perhaps, a second species in Africa.

1. **Parkinsonia aculeata** L. Sp. Pl. 375. 1753.

A shrub, or a tree up to about 9 m. high, with brown bark slightly fissured into small plates, and slender, spreading or drooping branches, the young twigs pubescent, the stipular spines 3 cm. long or less. Pinnæ 1 or 2 pairs, appearing like sessile pinnate leaves, 2-4 dm. long, the rachis flat, narrowly winged, bearing 10-25 pairs of short-petioluled linear to obovate leaflets 1.5-8 mm. long, or sometimes without leaflets; racemes few-several-flowered, as long as the leaves or shorter; pedicels very slender, 0.5-2 cm. long; calyx 6-8 mm. long; petals nearly orbicular, about twice as long as the calyx; stamens about one-half as long as the petals; pods drooping, linear-cylindric, 5-15 cm. long, much constricted between the seeds, which are oblong-cylindric, about 1 cm. long.

Plains and wet soil at lower elevations, eastern and southern districts near the coasts of Porto Rico, ascending the Coamo Valley nearly to Coamo Springs; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—southern United States; West Indies; continental tropical America and Old World tropics. Often planted for ornament, and grows luxuriantly in regions of low rainfall, highly decorative when in bloom. PALO DE RAYO. JERUSALEM THORN. HORSEBEAN.

17. **DELONIX** Raf. Fl. Tell. 2: 92. 1836.

Unarmed trees, with evenly bipinnate, estipulate leaves of numerous small leaflets, and large showy, orange to scarlet flowers in terminal or axillary corymbose racemes. Calyx deeply 5-lobed, the nearly equal lobes valvate. Petals 5, long-clawed, the blade nearly orbicular. Stamens 10, declined; filaments distinct; anthers longitudinally dehiscent. Ovary sessile, many-ovuled; style slender or short; stigma truncate, ciliolate. Pod broadly linear, flat, woody, 2-valved, nearly solid between the oblong, transverse seeds. Endosperm present; cotyledons thick. [Greek, referring to the long-clawed petals.] About 3 species, natives of Africa, the following typical.

1. **Delonix regia** (Bojer) Raf. Fl. Tell. 2: 92. 1836.

Poinciana regia Bojer; Hook. Bot. Mag. pl. 2884. 1829.

A widely branched tree, reaching a maximum height of about 12 m. with a trunk up to 9 dm. in diameter, flanged at the base, the thin bark gray-brown, the twigs somewhat pubescent. Leaves 3-5 dm. long; petiole stout, reddish or yellow, 7-12 cm. long; pinnæ 10-25 pairs, short-stalked, 8-15 cm. long, the rachis pubescent; leaflets 20-40 pairs, oblong, puberulent on both sides, 4-10 mm. long, inequilateral, rounded at both ends; pedicels stout, 4-8 cm. long; calyx about 2 cm. long; petals spreading and reflexed, 5-7 cm. long, orange to scarlet and mottled; stamens shorter than the petals; pod 4-6 dm. long, 5-7 cm. wide, dark brown.

Roadsides, Porto Rico, occasionally spontaneous after planting; St. Croix; St. Thomas. Native of Madagascar. Widely planted for ornament in tropical and subtropical regions. Its most elegant bloom is in summer, but an occasional tree flowers as early as April first. The nearly white wood is weak, soft and light. FLAMBOYAN. FLAMBOYANT. ROYAL POINCIANA. FLAME TREE.

18. **HAEMATOTOXYLON** L. Sp. Pl. 384. 1753.

Trees or shrubs, with red or yellow wood, evenly pinnate leaves, the leaflets obcordate, the spinescent stipules persistent or deciduous, the showy yellow, minutely bracted flowers in loose, axillary racemes. Calyx-tube very short, its 5 segments imbricated, somewhat unequal. Petals 5, oblong, spreading, somewhat unequal. Stamens 10, distinct; filaments pilose at the base; anthers all alike. Ovary short-stipitate, 2-3-ovuled, style filiform; stigma terminal, small. Pod flat, membranous, oblong or lanceolate, not dehiscent along the sutures, but splitting through the middle of the valves. Seeds transverse, oblong; endosperm none; cotyledons 2-lobed. [Greek, bloodwood.] Two known species, the following typical.

1. **Haematoxylon campechianum** L. Sp. Pl. 384. 1753.

A glabrous tree up to about 8 m. high, or sometimes shrubby, with spreading branches, the trunk ridged, the bark smooth and light gray, the twigs slender. Stipular spines 5-15 mm. long; leaves petioled, 5-10 cm. long; petiolules very short; leaflets 2-4 pairs, chartaceous, cuneate-obovate, 1-3 cm. long, finely many-veined, usually rather deeply emarginate, shining above; racemes several-many-flowered, short-peduncled, 2-5 cm. long; pedicels filiform, spreading, 4-6 mm. long; stamens about as long as the petals; pod oblong, delicately veined, 2-5 cm. long, 8-12 mm. wide, very thin, pointed at both ends.

Hillsides and coastal woods, southern and western districts of Porto Rico at lower elevations; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; Central America. The red, hard, strong and durable wood yields the dye haematoxylin. LOGWOOD. CAMPECHE.

19. **POINCIANA** L. Sp. Pl. 380. 1753.

Shrubs or small trees, sometimes prickly, with evenly bipinnate leaves, and orange or yellow, showy flowers in panicles or racemes, the bracts early deciduous or none. Calyx-tube short, the 5 lobes imbricated, unequal, the lowest one the largest. Petals 5, unequal. Stamens 10, distinct, long-exserted; anthers longitudinally dehiscent. Ovary sessile, several-ovuled; style slender; stigma small, terminal. Pod linear or linear-oblong, flat, 2-valved. Seeds transverse; endosperm none. [In honor of Poinci, a governor of the West Indies.] A few species, of tropical and subtropical distribution, the following typical.

1. **Poinciana pulcherrima** L. Sp. Pl. 380. 1753.

Caesalpinia pulcherrima Sw. Obs. 166. 1791.

A glabrous shrub or small tree up to about 5 m. high, the branches prickly. Leaves 3 dm. long or less, unarmed, the petiole and lower part of the rachis stout, the upper part of the rachis very slender; pinnae 3-9 pairs, short-stalked; leaflets 5-12 pairs, thin, very short-stalked, oblong to oblong-obovate, bright green above, pale beneath, 1-2 cm. long, 7-10 mm. wide, rounded or subtruncate and mucronulate at the apex, obtuse at the base; racemes large, terminal and axillary; pedicels slender 5-8 cm. long; sepals unequal, the larger about 1.5 cm. long; petals orange or yellow, 1.5-2.5 cm. long; stamens 5-6 cm. long; pod flat, broadly linear, 12 cm. long or less, 14-18 mm. wide, somewhat oblique, pointed at both ends, its valves subcoriaceous, glabrous, twisting after dehiscence; seeds compressed.

Roadsides and thickets, Porto Rico, escaped from cultivation; St. Croix; St. Thomas:—commonly planted for ornament in Porto Rico and the Virgin Islands; widely distributed through cultivation in all tropical regions, its origin unknown. CLAYELLINA. BARBADOS PRIDE. DOODLE-DO. DUL-DUL.

Poinciana Gilliesii Hook., *ESPIGO DE AMOR*, native of Argentina, occasionally planted for ornament in Porto Rico gardens, is a climbing or straggling shrub, with long slender branches, the bipinnate leaves with numerous small black-punctate leaflets, the inflorescence densely glandular, the large yellow flowers racemose, with filaments three or four times as long as the petals, the flat pod 6–10 cm. long, about 2 cm. wide. [*Caesalpinia Gilliesii* Wall.]

20. **CAESALPINIA** L. Sp. Pl. 380. 1753.

Unarmed or prickly shrubs or trees, with evenly bipinnate or simply pinnate leaves and racemose bracted flowers, the bracts commonly early deciduous or none. Calyx-tube short or none, the segments or sepals imbricated, the lower one often cucullate. Petals 5, broad, imbricated, more or less unequal. Stamens 10, distinct, declined, short-exserted; anthers all alike, longitudinally dehiscent. Ovary sessile; style mostly filiform; stigma terminal. Pod linear to oblong, dehiscent, flat or compressed. Seeds transverse; endosperm none. [Commemorates Andreas Caesalpinus, 1519–1603, famous Italian physician and botanist.] Twenty species or more, of tropical and subtropical regions. Type species: *Caesalpinia brasiliensis* L.

1. **Caesalpinia monensis** Britton, sp. nov.

A branched shrub, about 2 m. high, the twigs rather copiously armed with paired straight stipular prickles 5–9 mm. long. Leaves unarmed; petioles only about 2 mm. long; pinnae a single pair; petiolules longer than the petioles; leaflets 1–3 pairs, 5–8 mm. long, elliptic to obovate-elliptic, chartaceous, glabrous, emarginate, pinnately few-veined; racemes terminal, 8–16-flowered, bractless; pedicels secund, very slender, curved, 2–3 cm. long, glabrous; flowers greenish yellow; calyx-tube broadly campanulate, 5 mm. long, the lower segment cucullate, about 8 mm. long, and twice as long as the others; petals shorter than the calyx-segments; filaments pubescent, nearly twice as long as the lower calyx-segment.

On the limestone plateau, Mona:—Endemic. At first doubtfully recorded as *C. domingensis* Urban.

Caesalpinia elata Sw., a species of the Old World tropics, was recorded by Eggers in 1876 as found on St. Croix, but he did not include it in his Flora of St. Croix and the Virgin Islands, published in 1879.

Caesalpinia glandulosa Bert., a little known species of Hispaniola, was recorded by Krebs from St. Thomas, presumably in error.

Caesalpinia vesicaria L. [*C. bijuga* Sw.], of Jamaica, Cuba and the Bahamas, was erroneously recorded as Porto Rican by Grosourdy.

21. **LIBIDIBIA** Schl. Linnaea 5: 192. 1830.

Unarmed trees, with unevenly bipinnate leaves, the leaflets small and numerous, the small bractless yellow flowers in axillary and terminal racemes or panicles. Calyx with a turbinate tube and 5 recurved nearly equal segments. Petals 5, about as long as the calyx, one of them reflexed. Stamens 10, somewhat longer than the petals; anthers all alike. Stigma terminal. Pod oblong, twisted, curled or straight, several-seeded, indehiscent. Seeds oblong, compressed-turgid, smooth. [From the aboriginal name.] A few species of tropical America, the following typical.

1. *Libidibia coriaria* (Jacq.) Schl. *Linnaea* 5: 193. 1830.*Poinciana coriaria* Jacq. *Sel. Stirp. Am.* 123.*Caesalpinia coriaria* Willd. *Sp. Pl.* 2: 532. 1799.*Caesalpinia thomaea* Spreng. *Syst.* 2: 343. 1825.

A tree, up to 10 m. high, with spreading, crooked branches, the slender brown twigs glabrous or puberulent. Leaves 1-2 dm. long; petioles and rachis tomentulose; pinnae 4-10 pairs and a terminal one, short-stalked; leaflets 12-28 pairs, 4-8 mm. long, linear-oblong, obtuse at the apex, subcordate or truncate at the base, glabrous and dull on both sides, usually with one or more black dots beneath; flower-clusters shorter than the leaves; pedicels glabrous, 2-4 mm. long; calyx about 5 mm. long; petals spatulate; pod 3-6 cm. long, 1-2 cm. wide; seeds 6-7 mm. long.

Hillsides, St. Thomas and planted on St. Croix.—Bahamas (spontaneous after cultivation); Jamaica; Hispaniola; St. Martin; St. Eustatius; Saba; Montserrat; Trinidad (naturalized after cultivation); Margarita; Bonaire; Curaçao; Aruba; continental tropical America. The characteristic pods are astringent, containing much tannin, used in tanning leather and in pharmacy. DIVI-DIVI. LIBI-LIBI.

Libidibia punctata (Willd.) Britton. QUEBRAHACHA, Venezuelan, a tree 12 m. high or higher, the ridged bark smooth and gray, with glabrous bipinnate leaves up to 3 dm. long, the leaflets 3-5 pairs, elliptic or obovate, rounded or obtuse, 1-2 cm. long, the numerous yellow flowers in long-stalked racemes, one petal orange-variegated, the woody, straight, oblong pod about 5 cm. long has long been growing in the park at St. Thomas; three fine trees were studied there in 1924. [*Caesalpinia punctata* Willd.]

22. **GUILANDINA** L. *Sp. Pl.* 381. 1753.

Woody vines, the stems and branches mostly armed with stout recurved prickles. Leaves large, petioled, bipinnate, the leaflets often punctate. Flowers rather large, yellow, racemose or paniculate, the narrow bracts deciduous. Calyx-lobes 5, imbricated, longer than the tube. Petals 5, nearly alike, spreading. Stamens 10, the filaments pubescent below, the anthers longitudinally dehiscent. Pods oval or elliptic, not much longer than wide, subcoriaceous, compressed, usually prickly, splitting along the sutures. Seeds hard, globose or ovoid, yellow, gray or black, smooth, scarcely flattened. [Commemorates Melchior Guilandinus, a German traveller and botanist who died in 1590.] About 12 species, mostly West Indian. Type species: *Guilandina Bonduc* L.

Stipules usually large, broad, often foliaceous, sometimes wanting;

seeds gray; bracts reflexed.

Stipules none or subulate, 3 mm. long or less.

Seeds yellow.

Leaflets 4-8 cm. long; bracts erect.

Leaflets 1-3 cm. long; bracts, or their tips, spreading.

Seeds black or dark brown.

Seeds nearly black; leaflets ovate.

Seeds dark brown; leaflets oval-orbicular.

1. *G. Crista*.2. *G. Bonduc*.3. *G. divergens*.4. *G. melanosperma*.5. *G. portoricensis*.1. **Guilandina crista** (L.) Small, *Fl. SE. U. S.* 591. 1903.*Caesalpinia Crista* L. *Sp. Pl.* 380. 1753.*Guilandina Bonducella* L. *Sp. Pl.* ed. 2. 545. 1762.*Caesalpinia Bonducella* Fleming, *Asiatic Res.* 11: 159. 1810.*Guilandina Bonduc minus* DC. *Prodr.* 2: 480. 1827.

A vine, up to 6 m. long, trailing or climbing, the twigs and leaves armed with hooked prickles, the twigs also more or less densely bristly. Stipules usually foliaceous, thin, usually incised, persistent, sometimes 5 cm. broad, rarely wanting; leaves 3-8 dm. long, more or less pubescent; pinnae 4-8 pairs, short-stalked;

leaflets 4-8 pairs, short-stalked; leaflets 4-8 pairs, oblong to ovate-oblong or elliptic, rather thin, 2.5-7 cm. long, obtuse, retuse or short-acuminate and often mucronate at the apex, nearly sessile, rounded or subcordate at the base; racemes axillary, pubescent, many-flowered, sometimes 3 dm. long; bracts linear-acuminate, reflexed, or spreading, 1-1.5 cm. long, deciduous; pedicels 1 cm. long or less; calyx 7-9 mm. long; petals oblong-ovate, about 1 cm. long; pod 5-10 cm. long, 6 cm. wide or less, usually densely prickly; seeds grey, shining, obovoid-oval, lightly compressed, 2-2.5 cm. long, about 1.5 cm. wide.

Coastal sands and sand-dunes, Porto Rico; Mona; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda.—Florida; Bermuda; West Indies; continental tropical America; Old World tropics. GRAY NICKERS. MATO DE PLAYA. MATO AZUL.

2. **Guilandina Bonduc** L. Sp. Pl. 2, 545. 1753.

Caesalpinia Bonduc Roxb. Hort. Beng. 32. 1814.

A trailing or climbing vine, armed with hooked prickles. Stipules none; leaves often 6 dm. long, stout-petioled; pinnae 3-6 pairs; leaflets 4-8 pairs, ovate to elliptic-ovate, 4-8 cm. long, acute or short-acuminate at the apex, rounded or obtuse at the base, subcoriaceous, somewhat shining above, glabrous or very nearly so when old; racemes 3 dm. long or less, many-flowered; bracts linear-lanceolate, erect, early deciduous; pedicels 4-8 mm. long; calyx about 6 mm. long; petals 1.5 cm. long or less; pod 6-12 cm. long, about one-half longer than wide, rather loosely prickly; seeds bright yellow, 1.5-2.5 cm. long. [*Caesalpinia Bonduc* Roxb.]

Recorded by Urban as found at Isabela, Porto Rico, by Stahl, the determination from a leaf only.—Florida; Bahamas; Cuba; Jamaica; Central America; tropical Asia. YELLOW NICKERS.

3. **Guilandina divergens** (Urban) Britton, Ann. Mo. Bot. Gard. 2: 41. 1915.

Caesalpinia divergens Urban, Symb. Ant. 2: 271. 1900.

Prickly, or sometimes unarmed, usually much branched, up to 4 m. long or longer, the young twigs and leaf-rachises puberulent. Stipules only 1-3 mm. long or wanting; leaves 1.5-2.5 dm. long; pinnae 4-7 pairs; leaflets 5-7 pairs, broadly oval, ovate or oval-obovate, 1.5-3 cm. long, chartaceous, inequilateral, rounded or emarginate at the apex, obtuse, rounded, or the upper ones narrowed at the base, shining above, dull beneath, puberulent on the veins but otherwise glabrous; racemes peduncled, as long as the leaves or shorter, the rachis, pedicels and calyx puberulent; bracts linear-lanceolate, erect with spreading tips, about 8 mm. long; sepals 7-8 mm. long; petals yellow, about as long as the calyx; pod 6-7 cm. long, about 5 cm. wide, loosely prickly; seeds yellow or grayish-yellow, fading whitish, 1.5-2.5 cm. long, horizontally striate. [*Guilandina Bonduc* of Schlechtendal and of Eggers.]

Coastal thickets, Mona; Icaos; (?) Muertos; Culebra; St. Croix; St. Thomas; St. Jan; Virgin Gorda. SMALL YELLOW NICKERS.

4. **Guilandina melanosperma** Eggers, Bull. U. S. Nat. Mus. 13: 46. 1879; Britton, Ann. Mo. Bot. Gard. 2: 41. 1915.

Caesalpinia melanosperma Urban, Symb. Ant. 2: 276. 1900.

A vine-like shrub, with long branches, the twigs densely puberulent, armed with scattered, short recurved prickles. Stipules none. Leaves 2 dm. long or longer, the rachis densely puberulent, prickly; pinnae about 4 pairs; leaflets 5-7 pairs, ovate, inequilateral, nearly glabrous, 2 cm. long or less, shining above, obtuse or rounded, the base subtruncate; racemes several-many-flowered, shorter than the leaves, densely puberulent; bracts subulate, erect or ascending, about 4 mm. long; petals yellow, about 8 mm. long; pod 6 cm. long, 4 cm. wide, the sides

smooth, the margins sparingly prickly; seeds nearly black, shining, about 2 cm. long and 1.5 cm. broad.

Coastal thickets, Mona; St. Croix; Tortola (according to Eggers). Endemic. BLACK NICKERS.

5. **Guilandina portoricensis** Britton & Wilson, sp. nov.

Stems unarmed, up to 6 m. long, the twigs puberulent. Stipules none; leaves about 1.5 dm. long, the rachis puberulent; pinnae 3-5 pairs, bearing a few short prickles; leaflets 3-5-pairs, oval-orbicular, 1-2 cm. long, chartaceous, inequilateral, light green, dull, glabrous, rounded or emarginate at the apex, rounded at the base; pod 5-6 cm. long, about 4 cm. wide, unarmed or with a few short marginal prickles; seeds dark brown to nearly black, 1.5-2 cm. long, shining, smooth, not horizontally striate.

Limestone bench, Salinas de Guanica, Porto Rico (Britton, Cowell & Brown, 4916). In fruit March, 1915.

23. **BIANCAEA** Todaro, Nuov. Gen. 21. 1858-61.

Prickly woody vines, rarely small trees, with evenly bipinnate leaves and racemose deflexed, yellow or yellowish flowers. Calyx-tube broadly urceolate, the 5 segments petaloid, deciduous. Petals 5, short-clawed, longer than the calyx-segments. Stamens 10; filaments densely woolly below, a little longer than the petals. Ovary sessile; style slender; stigma subtruncate. Pod flat, unarmed, oblong or falcate, few-seeded, tardily dehiscent or indehiscent. Seeds with thick cotyledons. [Commemorates Guiseppe Bianca, a student of the Sicilian flora.] A few species of the Old World tropics, the following typical.

1. **Biancaea sepiaria** (Roxb.) Todaro, Hort. Bot. Panorm. 3. 1876.

Caesalpinia sepiaria Roxb. Hort. Beng. 32. 1814.

Biancaea scandens Todaro, Nuov. Gen. 22. 1858-61.

A much-branched very prickly vine-like shrub 3 m. high or less, the young twigs and foliage puberulent. Petiole stout, tapering into the rachis, which is very slender above; stipules half-sagittate, early deciduous; leaves 1-5 dm. long; pinnae 4-10 pairs, short-stalked; leaflets 7-12 pairs, thin, oblong, rather dark green above, pale green beneath, 8-20 mm. long, rounded or retuse at the apex, obtuse at the base, very short-stalked; racemes axillary and terminal, puberulent, usually many-flowered; flowers deflexed at anthesis; pedicels 1.5-3 cm. long; calyx about 1.5 cm. long, puberulent; petals suborbicular, about 1.5 cm. broad; filaments about as long as the petals; filaments densely woolly below; pod oblong, compressed, glabrous, unarmed, 5-8 cm. long, 2-2.5 cm. wide, abruptly long-beaked, 6-8-seeded; seeds oblong-ovoid, black and variegated, nearly 1 cm. long, 5-6 mm. thick.

Roadsides and thickets, Porto Rico, at lower and middle elevations:—Jamaica; Cuba to Grenada; native of the East Indies. ZARZA DE CERCAS. WAIT-A-BIT.

Biancaea Sappan (L.) Todaro, East Indian, a small, slightly prickly tree, the leaves with numerous obliquely oblong leaflets about 2 cm. long, the flowers in large terminal panicles, the flat shining indehiscent pod 7-10 cm. long, 3-4 cm. wide, with a short recurved beak, is occasionally planted for ornament in the Virgin Islands. [*Caesalpinia Sappan* L.]

Schizolobium excelsum Vogel, Brazilian, grown from seed by Mr. Thompson at the St. Croix Agricultural Experiment Station, forms a very large tree, its leaves bipinnate, its flowers racemose.

Peltophorum Linnaei Benth. BRASILETTO, Jamaican, planted at the University of Porto Rico, Rio Piedras, forms a large tree with bipinnate leaves, the elliptic leaflets puberulent, 2-5 cm. long, the yellow flowers racemose, with one of the calyx-lobes larger than the others, the flat broad pod 6-10 cm. long.

Peltophorum ferrugineum (Dcne.) Benth., Australian, young trees of which were seen in the Governor's Garden, Rio Piedras, Porto Rico, 1923, is also a large tree, the numerous leaflets oblong, rounded or subtruncate, about 2 cm. long, the racemes ferruginous-pubescent, the flat pod about 10 cm. long. [*Caesalpinia ferruginea* Dcne.]

Gleditsia triacanthos L., HONEY LOCUST, North American, and **Gleditsia sinensis** Lam., Chinese, were grown from seed at the Porto Rico Forest Station, Rio Piedras, in 1922, reaching a height of about 1.5 m. by the end of the year. The climate is presumably too continuously warm for their establishment.

Phyllocarpus septentrionalis Donnell Smith, Guatemalan, sent by the Bureau of Plant Industry to the Forest Station at Rio Piedras at the end of 1921, has attained a height of over 3 meters by the spring of 1923 from seedlings.

Copaiva hymenaefolia (Moric.) Kuntze, a Cuban species, was erroneously listed as also Porto Rican by Cook and Collins. [*Copaifera hymenaefolia* Moric.]

Copaiva officinalis Jacq., of the southern West Indies and Venezuela, was erroneously recorded from Porto Rico by Grosourdy and by Cook and Collins. [*Copaifera officinalis* L.]

Hermesius coccinea (Jacq.) Kuntze, ROSA DEL MONTE, Venezuelan, was planted in St. Croix prior to 1797, according to West. It is a tree, with evenly pinnate leaves of 4 or 6 oblong, acuminate, glabrous leaflets, the clustered scarlet flowers about 4 cm. long, the calyx 4-5-lobed, the 5 petals clawed. [*Brownea coccinea* Jacq.]

Family 8. **KRAMERIACEAE** Dumort.

KRAMERIA FAMILY.

Shrubs or perennial herbs, mostly tomentose or silky, with alternate, simple and entire, or rarely 3-foliolate leaves, and rather large, irregular flowers, axillary or in terminal bracted racemes. Sepals 4 or 5, unequal. Petals 5, the 3 upper ones long-clawed, distinct or partly united, the 2 others much smaller, thick, sessile. Stamens 3 or 4; filaments united at base or up to the middle; anthers 2-celled, the sacs dehiscent by a pore. Ovary 1-celled; ovules 2, collateral, pendulous, anatropous; style cylindrical, acute. Fruit globose, indehiscent, spiny, 1-seeded. Seeds with thick cotyledons and no endosperm. The family consists of the following genus only.

1. **KRAMERIA** Loefl.; L. Sp. Pl. ed. 2, 177. 1762.

Characters of the family [Commemorates J. G. H. Kramer, Austrian botanist]. About 15 species, of tropical and warm-temperate America, the following typical.

1. *Krameria Ixina* L. Sp. Pl. ed. 2, 177. 1762.

A shrub about 1 m. high or less, irregularly branched, the stiff slender branches whitish-tomentose. Leaves simple, entire, narrowly oblong or oblong-lanceolate, 1–2.5 cm. long, tomentose, the apex spinulose-acuminate, the base narrowed, the slender petioles 2–6 mm. long; flowers in short terminal bracted racemes; pedicels very short; sepals ovate, acuminate, silky, about 6 mm. long; larger petals lavender or purple, a little longer than the sepals; body of the fruit pubescent, 5–6 mm. in diameter, the slender numerous spines 4–6 mm. long, retrorsely barbed above.

Coastal thickets and hillsides near the coast, dry southwestern districts of Porto Rico; Mona; St. Thomas;—Hispaniola; St. Eustatius; Antigua; Bonaire; Curaçao; Colombia.

Family 9. **FABACEAE** Rchb.

PEA FAMILY.

Herbs, shrubs, vines or trees, with alternate mostly compound stipulate leaves, and irregular (papilionaceous) perfect or sometimes polygamodioecious flowers, mainly in spikes, heads, racemes or panicles. Calyx 4–5-toothed, or 4–5-cleft, sometimes 2-lipped. Petals more or less united, or separate, perigynous or hypogynous, usually consisting of a broad upper one (standard, banner), two lateral ones (wings), and two front ones more or less united (forming the keel); the standard enclosing the wings in the bud. Stamens monadelphous, diadelphous, or sometimes separate, 10 in most of the genera, sometimes 9, rarely 5. Pistil simple, superior; ovary mainly 1-celled, sometimes 2-celled by the intrusion of the sutures, or several-celled by cross partitions; style simple; ovules 1–many, anatropous or amphitropous. Fruit a legume, 1–many-seeded, dehiscent into 2 valves, or indehiscent, in one tribe a loment. Seeds mostly without endosperm; cotyledons thick. About 325 genera and over 5000 species, most abundant in temperate and warm regions.

1. Stamens 10, distinct (SOPHOREAE).
 - Pod flat, winged, 1-seeded at the apex.
 - Pod wingless, 2–many-seeded.
 - Pod 2-valved; trees.
 - Pod indehiscent; shrubs.
 2. Stamens monadelphous or diadelphous.
 - A. Herbs, shrubs, or trees; (*Securidaca* and *Barbieria* vine-like).
 - a. Pod 2-valved (indehiscent in *Parosela*).
 - *Leaves digitately 3-foliolate or 1-foliolate or simple.
 - Stamens monadelphous (GENISTEAE).
 - Stamens diadelphous (TRIFOLIEAE).
 - Flowers spicate or racemose.
 - Flowers capitate or umbellate.
 - **Leaves pinnate (GALEGEAE).
 - †Anther-connective appendaged by a gland or penicillate; pod turgid or terete.
 - ††Anther-connective unappendaged.
 - ‡Foliage glandular-dotted; pod small, 1–2-seeded, indehiscent.
 - ‡‡Foliage not glandular-dotted; pod several-seeded, dehiscent.
 - §Racemes terminal or opposite the leaves, or axillary in *Barbieria*.
 - Calyx short; petals short-clawed.
 - Calyx long-tubular; petals long-clawed.
 - §§Inflorescence axillary.
 - Pod continuous, not septate between the seeds.
 - Style subulate; stigma terminal.
 - Leaves unevenly pinnate.
 - Leaves evenly pinnate, the rachis terminating in a tip; pod slender-stipitate.
1. *Myrospermum*.
 2. *Ormosia*.
 3. *Sophora*.
 4. *Crotalaria*.
 5. *Medicago*.
 6. *Trifolium*.
 7. *Indigofera*.
 8. *Parosela*.
 9. *Cracca*.
 10. *Barbieria*.
 11. *Gliricidia*.
 12. *Sabinea*.
 13. *Corynella*.

- Pod septate between the seeds.
 Leaves unevenly pinnate; style bearded on the inner side. 14. *Benthamantha*.
 Leaves evenly pinnate; style not bearded. Flowers yellow, or mottled, small; calyx-lobes acute or acuminate; standard broad; herbs or shrubs. 15. *Sesban*.
 Flowers large, white to red; calyx-lobes broad and short; standard narrow; tree. 16. *Agati*.
- b. Pod jointed (a loment), or indehiscent.
 *Pod a loment, except in *Arachis* (HEDYSAREAE).
 †Shrubs or small trees with pinnate, bristle-tipped leaflets. 17. *Pictetia*.
 ††Herbaceous plants; leaflets not bristle-tipped. Sheath of the stamens partly split, dividing the filaments into 2 clusters; leaves pinnate. Stamen-sheath not split; leaves 3-foliolate or pinnately few-foliolate. 18. *Aeschynomene*.
 Leaflets not stipellate. Calyx-tube elongated. Flowers small, terminal, capitate; pod small, hooked. Flowers large, axillary, solitary, the peduncle elongating, and the fruit ripening underground. Calyx-tube short; leaflets 2 or 4. 19. *Stylosanthes*.
 Leaflets stipellate. Loment-joints flat. Flowers paniced or racemose. Flowers 1-4 together, axillary or opposite the leaves. 20. *Arachis*.
 Loment-joints terete. 21. *Zornia*.
 22. *Meibomia*.
 23. *Sagotia*.
 24. *Alysicarpus*.
- **Pod not a loment, indehiscent; trees, shrubs or woody vines (DALBERGIEAE).
 Pod papery or leathery, not drupaceous. Leaflets alternate, or only one. Anthers terminal, opening by a terminal slit. Stamens 9, in 2 fascicles of 4 and 5; leaflets 3-5. Stamens 10; leaflet only one. Anthers versatile, opening longitudinally. Calyx obtuse at base; pod coriaceous. Calyx acute at base or turbinate; pod chartaceous. 25. *Securidaea*.
 26. *Ecastophyllum*.
 Leaflets opposite or mostly so. Pod flat, wingless. Pod with 4 membranous wings. 27. *Drepanocarpus*.
 28. *Pterocarpus*.
 29. *Lonchocarpus*.
 30. *Ichthyomethia*.
 31. *Andira*.
- B. Herbaceous or woody vines, pod 2-valved (*Erythrina* trees; *Cicer* herbaceous; *Cajan* shrubby; some of the Phaseoleae bushy).
 *Leaves pinnate; leaflets dentate (CICERINAE). 32. *Cicer*.
 **Leaves 3-foliolate or pinnate; leaflets entire. †Leaves evenly pinnate, the rachis terminating in a bristle (in other genera in a tendril) VICIAEAE. 33. *Abrus*.
 ††Leaves 3-foliolate, or unevenly pinnate (PHASEOLEAE). ‡Flowers normally papilionaceous. §Nodes of the inflorescence not swollen. ¶Leaves stipulate or leaflets stipellate. Style longitudinally bearded. Leaves pinnate; legume-valves ecostate, flat. Leaves 3-foliolate; legume-valves convex or ridged with a prominent midvein. 34. *Clitoria*.
 35. *Martusia*.
 Style glabrous. Bracts persistent; standard large, spurred or gibbous. Bracts deciduous; flowers small; standard unappendaged. 36. *Bradburja*.
 37. *Teramnus*.
 ¶¶Leaves estipulate; leaflets mostly estipellate. Pod several-many-seeded; erect shrub. 38. *Cajan*.
 Pod 2-3-seeded; vines. 39. *Dolicholus*.
 §§Inflorescence nodose-racemose (scarcely nodose in *Cacara*). ¶¶Style glabrous or sometimes pubescent at the base. Vexillar stamen free. Upper calyx-lobe 2-toothed. Calyx-lobes 4. 40. *Calopogonium*.
 41. *Galactia*.

- Vexillar stamen more or less united with the others.
 Calyx nearly equally 4-cleft. 42. *Dioclea*.
 Calyx 2-lipped. 43. *Canarali*.
- ¶¶Style bearded on the inner side, at least above.
 Keel a complete spiral or coil. 44. *Phascolus*.
 Keel not a complete spiral.
 Stigma oblique or lateral.
 Style not flattened above. 45. *Vigna*.
 Style flattened above, the lateral
 stigma globose. 46. *Cacara*.
 Stigma terminal. 47. *Dolichos*.
- ‡‡Either the standard or the keel very large; flowers large and showy.
 Keel the largest of the petals; pods mostly with stinging hairs.
 Perennial woody vines; seeds with a thick testa and linear hilum. 48. *Mucuna*.
 Annual herbaceous vines; seeds with a thin testa and short hilum. 49. *Stizolobium*.
 Standard the largest of the petals.
 Twining woody vine. 50. *Neorudolphia*.
 Trees, rarely shrubs. 51. *Erythrina*.

1. **MYROSPERMUM** Jacq. Enum. 4. 1760.

A tree, with unevenly pinnate leaves, the oblong or oval leaflets lineolate-punctate, and rather large white racemose flowers. Calyx turbinate, oblique and incurved, its membranous limb nearly truncate. Standard obovate, the other 4 petals nearly alike, lanceolate, curved, acute. Stamens 10, distinct; filaments filiform, elongated; anthers very small, oblong. Ovary stipitate; ovules 2 or several; style subulate, slightly curved; stigma very small. Pod flat, winged, indehiscent, bearing a single oblong seed at the apex. [Greek, balsam seed.] A monotypic genus of central and northern South America.

1. **Myrospermum frutescens** Jacq. Enum. 20. 1760.

A tree, up to 20 m. high, or often shrubby, the twigs glabrous. Leaves 1–2 dm. long, sparingly puberulent when young, glabrous when old, estipulate. Leaflets 11–17, thin, short-stalked, oblong, ovate-oblong or oval, 1.5–3 cm. long, rounded or retuse at the apex, obtuse, subtruncate, or narrowed at the base; racemes terminal, or in the upper axils, several-flowered, 7–10 cm. long; standard about 1.5 cm. long; pod 5–8 cm. long, stipitate, somewhat curved, including the wings about 1 cm. wide; seed compressed, about 1 cm. long.

Roadsides and woodlands, spontaneous after cultivation in Porto Rico and naturalized; St. Thomas (according to Krebs); St. Croix (according to Eggers);—Trinidad; continental tropical America. CERCPO.

2. **ORMOSIA** Jacks. Trans. Linn. Soc. 10: 360. 1811.

Trees, with large pinnate leaves, and rather large white to purple, paniced or racemose flowers. Calyx campanulate or oblong, its 2 upper teeth partly united. Standard nearly orbicular; wings obliquely obovate-oblong; keel-petals similar to the wings, distinct. Stamens 10, distinct, unequal; anthers versatile. Ovary nearly sessile, with 2–several ovules; style filiform, its apex involute; stigma lateral, introrse. Pod linear or oblong, coriaceous or woody, compressed, not winged, 2-valved. Seeds compressed, shining, red or spotted. [Greek, a necklace, referring to this use of the seeds.] About 20 species in tropical regions both the Old World and the New. Type species: *Robinia coccinea* Aubl.

1. **Ormosia Krugii** Urban, Symb. Ant. 1: 320. 1899.

A forest tree, up to 25 m. high, the twigs, foliage and inflorescence brownish-puberulent, the young bark corrugated, the old bark smooth. Leaves 5–10 dm. long, the petiole and rachis stout; leaflets 5–9, stout-stalked, oval or elliptic, coriaceous, 7–20 cm. long, strongly pinnately veined, obtuse or abruptly short-acuminate at the apex, obtuse or the terminal one narrowed at the base, glabrous above, puberulent beneath; panicles 3 dm. long or less, many-flowered, terminal and axillary; calyx pilose, about 1 cm. long; petals dark violet; wings and keel-petals about 15 mm. long; pod 5–10 cm. long, about 2 cm. wide across the seeds and deeply constricted between them, pointed at both ends; seeds suborbicular, red or black-spotted, about 1 cm. broad. [*O. dasycarpa* Bello, not Jacks.]

The wood is light, soft and weak. Primeval forests at higher and middle elevations Porto Rico;—Dominica. PALO DE MATOS, PERONIA.

Ormosia dasycarpa Jacks., listed by Krebs as found in St. Thomas, where it may, perhaps, have been planted, is a tree native in the southern Lesser Antilles.

3. **SOPHORA** L. Sp. Pl. 373. 1753.

Leaves odd-pinnate. Flowers white, yellow or violet, in terminal racemes or panicles. Calyx generally campanulate, its teeth short. Standard obovate or orbicular; wings obliquely oblong; keel oblong, nearly straight. Stamens all distinct or very nearly so; anthers versatile. Ovary short-stalked; style incurved. Pod stalked, coriaceous or fleshy, terete, constricted between the seeds, mainly indehiscent. [Name Arabic, yellow.] About 25 species, of herbs, shrubs and trees, natives of warm and tropical regions. Type species: *Sophora alopecuroides* L.

1. **Sophora tomentosa** L. Sp. Pl. 373. 1753.

A shrub 1–3 m. tall, with silky-tomentose foliage. Leaves 1–2 dm. long; leaflets 11–17, the blades leathery, oblong, oblong-obovate or oval, inequilateral, becoming glabrous and revolute-margined; racemes elongating, 1–4 dm. long; pedicels 5–10 mm. long; calyx oblong or oblong-funnelform, 5–8 mm. long, constricted at the base, undulate or indistinctly 5-lobed; corolla yellow; standard with an ovate blade fully 1 cm. broad, and over 1.5 cm. long; keel-petals 20 mm. long; pods 5–10 cm. long, strongly constricted between the seeds, long-stalked.

Coastal sands and thickets, southwestern districts of Porto Rico; St. Croix; St. Thomas; Tortola; Anegada;—Florida; Bermuda; West Indies; continental tropical America and Old World tropics.

4. **CROTALARIA** L. Sp. Pl. 714. 1753.

Herbs, sometimes slightly woody, with simple, or in many tropical species 3–7-foliolate leaves, and racemose yellow flowers. Calyx 5-toothed, slightly 2-lipped; standard orbicular or ovate, often cordate; wings oblong or obovate; keel curved. Stamens monadelphous, their sheath deeply cleft; anthers of 2 forms, alternating with each other, the one small, versatile, the other larger; style more or less curved; pod oblong or globose, inflated, many-seeded, the seeds loose at maturity. [Greek, a rattle.] About 250 species, mainly of tropical regions, called CAJABELILLO and RATTLEBOX. Type species: *Crotalaria lotifolia* L.

Leaves trifoliolate.

Herbaceous; racemes terminal, long-peduncled.

Racemes several-flowered; keel short-beaked.

Racemes many-flowered; keel subulate-beaked.

1. *C. incana*.

2. *C. striata*.

- Shrubby; racemes axillary, short-peduncled, few-flowered. 3. *C. lotifolia*.
 Leaves simple.
 Flowers blue; stipules lunate. 4. *C. verrucosa*.
 Flowers yellow.
 Stipules none or minute.
 Leaves linear; pods pubescent. 5. *C. juncea*.
 Leaves oblanceolate; pods glabrous. 6. *C. retusa*.
 Stipules present, at least with some of the leaves decurrent on
 the stem, their tips free above.
 Flowers few; pod sessile; stipules narrow. 7. *C. maritima*.
 Flowers several; pod stipitate; stipules broad. 8. *C. stipularia*.

1. ***Crotalaria incana*** L. Sp. Pl. 716. 1753.

Annual or biennial, herbaceous, usually branched, 1.3 m. high or less, the branches, petioles and racemes densely pubescent. Stipules subulate, 5 mm. long or less, deciduous, or wanting; petioles 2–8 cm. long; leaflets 3, obovate, oval or obovate-orbicular, short-stalked, 1–5 cm. long, thin, obtuse and often mucronulate at the apex, obtuse or narrowed at the base, pubescent beneath, glabrate above; racemes terminal, long-peduncled, several-flowered; calyx-segments lanceolate, acuminate, 7–9 mm. long; corolla yellow or greenish-yellow, 10–13 mm. long; pods oblong, pendent, pubescent, 2–3.5 cm. long, about 1 cm. thick.

Banks, fields and waste grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; Tortola; Virgin Gorda;—Florida; Bahamas; Jamaica; Cuba to Trinidad; Curaçao; continental tropical America and Old World tropics. SHAKE-SHAKE.

2. ***Crotalaria striata*** DC. Prodr. 2: 131. 1825.

Perennial, herbaceous or slightly woody, puberulent or finely pubescent, 1–2 m. high, the stem somewhat ridged. Leaves slender-petioled; leaflets 3, thin, elliptic to elliptic-obovate, obtuse, emarginate or acute at the apex, narrowed at the base, 4–10 cm. long, very short-stalked, about as long as the petioles; stipules usually none; racemes many-flowered, terminal, sometimes 3 dm. long; calyx 2-lipped, the lobes ovate or ovate-lanceolate, acuminate, about 5 mm. long; corolla yellow, purplish-veined, about 1 cm. long, the keel strongly curved, subulate-beaked, nearly twice as long as the wings; pods linear-oblong, short-stipitate, puberulent, or at length glabrous, deflexed, about 4 cm. long and 7 mm. thick, abruptly short-beaked.

Near Bayamon, Porto Rico (*Stevenson 2492*):—Jamaica; Tobago; native of the Old World tropics.

3. ***Crotalaria lotifolia*** L. Sp. Pl. 715. 1753.

Shrubby, branched, 6 dm.–2 m. high, slender and sometimes vinelike and up to 3 m. long, the branches and petioles appressed-pubescent. Stipules minute, deciduous; petioles slender, 2–6 cm. long; leaflets 3, oblong to elliptic, thin, 1–4 cm. long, obtuse at the apex, mostly narrowed at the base, short-stalked, silky-pubescent or glabrate beneath, usually glabrous above; racemes axillary, short-peduncled, few-flowered, as long as the leaves or shorter; calyx-segments lanceolate, acuminate, 5–7 mm. long; corolla yellow, about twice as long as the calyx, the standard reddish-veined; pod narrowly oblong, beaked, 2–3 cm. long, about 6 mm. thick, finely appressed-pubescent.

Hillsides and thickets at lower elevations in dry parts of the southern and eastern districts of Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda; Anegada;—Bahamas; Jamaica; Cuba; Hispaniola.

4. ***Crotalaria verrucosa*** L. Sp. Pl. 715. 1753.

Annual, 3–8 dm. high, branched, the branches zigzag, angled, finely appressed-pubescent. Leaves simple, broadly ovate or ovate-elliptic, obtuse, rounded or acute and mucronulate at the apex, narrowed at the base, 3–7 cm.

long, glabrous or nearly so above, finely appressed-pubescent beneath, short-petioled, the rounded stipules 3–6 mm. long; racemes several-flowered, longer than the leaves, the peduncle and rachis angled; calyx deeply cleft, its upper lobes ovate, the lower lanceolate; corolla blue, variegated, 1–1.5 cm. long, about twice as long as the corolla; pod sessile, oblong, beaked, appressed-pubescent with long hairs, 3–4 cm. long, 9–12 mm. thick.

Waste and cultivated grounds, St. Croix; St. Thomas; St. Jan; Tortola.—Bahamas; Jamaica; Cuba; St. Martin to Tobago; Panama; Colombia; Old World tropics. Abundant as a weed in the Virgin Islands, not observed in Porto Rico.

5. *Crotalaria juncea* L. Sp. Pl. 714. 1753.

Annual, erect, silky-pubescent, up to 2 m. high or higher, few-branched, virgate. Leaves simple, linear to linear-oblong, very nearly sessile, 4–10 cm. long, 5–10 mm. wide, acute; stipules minute or none; racemes terminal, elongated, several-many-flowered; pedicels stout, densely pubescent, 1 cm. long or less; calyx about 1.5 cm. long, deeply 5-parted, the segments linear-lanceolate; petals bright yellow; pods oblong, pubescent, 3–4 cm. long.

In a field at Bassin, St. Croix; recorded by West as cultivated on St. Croix prior to 1793; now cultivated in Porto Rico and St. Croix as a nitrogen-fixing plant. Naturalized in Jamaica. Native of the Old World tropics.

6. *Crotalaria retusa* L. Sp. Pl. 715. 1753.

Annual, appressed-pubescent, usually branched, 4–10 dm. high. Stipules minute or wanting; leaves simple, oblanceolate, spatulate or oblong, short-petioled, 4–8 cm. long, rounded or retuse at the apex, cuneate at the base, glabrous above, appressed-pubescent beneath; racemes terminal, peduncled, loosely several-many-flowered, 2 dm. long or less; pedicels 6–10 mm. long; calyx 2-lipped, about 10 mm. long; petals nearly twice as long as the calyx, yellow, the standard variegated; pod oblong, 2.5–3.5 cm. long, about 1 cm. thick, short-beaked, glabrous.

Fields, roadsides, waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda.—Florida; West Indies; continental tropical America and Old World tropics. MATRACA. SONAJUELAS. YELLOW LUPIN.

7. *Crotalaria maritima* Chapm. Fl. S. U. S. Suppl. 614. 1883.

Perennial by a deep root; branches several or many, slender, prostrate, pubescent with appressed hairs. Leaves simple, nearly sessile, oblong to oblanceolate, or the lower ones oval, 3 cm. long or less, the apex obtuse or acutish, the base narrowed, both surfaces appressed-pubescent; stipules narrow, decurrent, their tips linear-lanceolate, 6–7 mm. long; flowers lateral, few or solitary, long-peduncled; calyx appressed-pubescent; corolla small, yellow; pods oblong, glabrous, 1.5–3 cm. long. [*C. sagittalis* of Urban, not of Linnaeus.]

White sand, northern coastal plain of Porto Rico; near Yauco (according to Urban):—southeastern United States.

8. *Crotalaria stipularia* Desv. Journ. Bot. 3: 76. 1914.

Annual, or of longer duration, herbaceous, or somewhat woody below, erect, branched, 6–9 dm. high, pubescent with rather long hairs. Leaves simple, sessile, oblong or lanceolate, 2–7 cm. long or those of branches sometimes smaller; stipules broad, decurrent, up to 5 cm. long, their free tips incurved; flowers few or several, yellow, about 1 cm. wide, in long-stalked lateral racemes; calyx deeply 5-cleft, its segments lanceolate, long-hairy, about as long as the corolla; pod oblong, glabrous, 2–3 cm. long.

Banks, hillsides and fields, Porto Rico at lower and middle elevations:—Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.

Crotalaria laburnifolia L., was formerly cultivated on St. Croix, according to West. It is an Asiatic species with 3-foliolate glabrous leaves, yellow racemose flowers, and long-stipitate, pendulous pods.

Crotalaria mucronata Desv., described in 1814 from the "Antilles," was recorded by Krebs in 1851 as found in St. Thomas; it is otherwise known only to modern botanists from the original incomplete description.

5. **MEDICAGO** [Tourn.] L. Sp. Pl. 778. 1753.

Herbs, with 3-foliolate leaves, and small yellow or violet flowers in axillary spikes or racemes. Leaflets commonly dentate, the veins terminating in the teeth. Calyx-teeth short, nearly equal; standard obovate or oblong; wings oblong; keel obtuse; stamens diadelphous, the 1 opposite the standard separate from the other 9; anthers all alike; ovary 1-several-ovuled; style subulate; pod curved or spirally twisted, reticulated or spiny, indehiscent, 1-few-seeded. [Greek, *Medike*, from *Medea*, whence the *Medic*, or *Lucerne*, was derived.] About 50 species, natives of Europe, Asia and Africa, the following typical.

1. **Medicago sativa** L. Sp. Pl. 778. 1753.

Decumbent or ascending, 3-5 dm. high, the young shoots and leaves with some scattered hairs. Leaflets oblanceolate or obovate, 4-25 mm. long, dentate, obtuse, truncate or emarginate and often mucronate, narrowed or cuneate at the base; stipules entire; peduncles 1-5 cm. long, bearing a short raceme of violet flowers; petals about 5 mm. long; pod pubescent, twisted into 2 or 3 spirals.

Waste grounds, Mayaguez; occasionally cultivated for fodder and persistent for a few years in the Virgin Islands and in Porto Rico, and widely in the temperate zones; naturalized in North America. Native of Europe. ALFALFA. LUCERNE.

6. **TRIFOLIUM** [Tourn.] L. Sp. Pl. 764. 1753.

Herbs, with mostly 3-foliolate (occasionally 4-11-foliolate) denticulate leaves, the flowers in dense heads or umbels. Stipules adnate to the petiole. Calyx-teeth nearly equal. Petals commonly persistent, their claws adnate to the stamen-tube. Stamens diadelphous, or the tenth one separate for only a portion of its length. Ovary few-ovuled. Pod often included in the calyx, membranous, indehiscent or tardily dehiscent by 1 suture, 1-6-seeded. [Latin, referring to the 3 leaflets.] About 275 species, most abundant in the north temperate zone. Type species: *Trifolium pratense* L.

1. **Trifolium pratense** L. Sp. Pl. 768. 1753.

Perennial, pubescent, 1.5-6 dm. high. Leaves long-petioled; stipules ovate, strongly veined, subulate-tipped, 12-20 mm. long; leaflets short-stalked, oval, oblong or obovate, narrowed at base, hardly cuneate, obtuse and sometimes emarginate at the apex, often dark-spotted near the middle, finely denticulate, 1-3.5 cm. long; heads globose or ovoid, rarely slightly peduncled, about 2.5 cm. long; flowers red (rarely white), about 12 mm. long, remaining erect in fruit; calyx sparingly hairy, its subulate teeth shorter than the corolla.

Waste grounds, San Juan, 1914;—Bermuda; Cuba. Widely naturalized in the north temperate zone. Native of the Old World. RED CLOVER.

7. **INDIGOFERA** L. Sp. Pl. 751. 1753.

Herbs, or rarely shrubs, often canescent with hairs affixed by the middle, with odd-pinnate leaves, small stipules, and pink or purple, spicate or racemose flowers. Calyx-teeth oblique, nearly equal, or the lower longer; standard ovate or orbicular, sessile or clawed; wings oblong; keel erect, somewhat gibbous, or spurred; stamens mainly monadelphous; ovary 1- α -ovuled; style slender; pod linear, 4-angled or subterete, septate between the seeds. [Name from the yield of indigo by some species.] About 275 species, natives of warm and temperate regions, known as ANIL and INDIGO. Type species: *Indigofera tinctoria* L.

Pods 5-15 mm. long.

Pods curved, falcate, on reflexed pedicels.

Pods straight, on spreading pedicels.

Pods 2.5-3.5 cm. long.

Pods nearly straight; leaflets glabrous above.

Pods curved; leaflets pubescent on both sides.

1. *I. suffruticosa*.

2. *I. guatemalensis*.

3. *I. tinctoria*.

4. *I. sumatrana*.

1. **Indigofera suffruticosa** Mill. Gard. Dict. ed. 8, no. 2. 1768.

Indigofera Anil L. Mant. 2: 272. 1771.

Indigofera truxillensis H. B. K. Nov. Gen. 6: 456. 1823.

Anila tinctoria vera Kuntze, Rev. Gen. Pl. 160. 1891.

A shrub, 1-1.5 m. high, usually much-branched, the branches slender, tough-whitish appressed-pubescent and grooved when young. Leaves 5-12 cm. long; stipules filiform-setaceous, very small; leaflets 9-17, oblong or oblong-obovate, 3 cm. long or less, obtuse or acutish and mucronate at the apex, mostly narrowed at the base, pale green, appressed-pubescent on both sides, or glabrous above, darkening in drying; racemes narrow, several-many-flowered, 2-5 cm. long; pedicels about 1 mm. long, about equalling the campanulate pubescent calyx, reflexed in fruit; corolla yellowish, 3.5-4.5 mm. long; pod falcate, appressed-pubescent when young, glabrous when old, 8-15 mm. long, 2 mm. thick, ridged on the sutures, 3-8-seeded.

Thickets, fields, hillsides and river-banks at lower and middle elevations, Porto Rico; Vieques; Mona; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—southeastern United States; West Indies; tropical continental America; introduced into tropical regions of the Old World.

2. **Indigofera guatemalensis** Moç. & Sessé; Prain & Baker, Journ. Bot. 40: 67. 1902.

Indigofera tinctoria brachycarpa DC. Prodr. 2: 224. 1825.

A shrub, similar to the preceding species. Leaves sometimes smaller; leaflets 9-13, oblong or obovate, 2 cm. long or less, appressed-pubescent on both sides; racemes and flowers much like those of *I. suffruticosa*, but the pedicels spreading or scarcely reflexed in fruit; pod straight, sometimes shorter than that of *I. suffruticosa*, sometimes as long, 2 mm. thick.

Hillsides and fields, at lower elevations in the western districts of Porto Rico; St. Thomas;—continental tropical America. Sometimes cultivated.

3. **Indigofera tinctoria** L. Sp. Pl. 751. 1753.

A shrub, up to 2 m. high, with slender branches, the twigs minutely appressed-pubescent. Leaves 6-10 cm. long; stipules minute; leaflets 7-13, oblong to oblong-obovate, 1-2 cm. long, darkening in drying, glabrous or nearly so above, appressed-canescent beneath, the apex rounded, mucronulate, the base narrowed or obtuse; racemes several-many-flowered, 2-7 cm. long; pedicels very short, not longer than the pubescent calyx, reflexed in fruit; corolla 5-6 mm. long, red-

dish or purplish; pod linear, straight or but little curved, glabrous when old, 2.5–3.5 cm. long, 2 mm. wide, 8–15-seeded.

Thickets, Quebradillas, Porto Rico; Vieques; St. Croix; St. Thomas; formerly cultivated in the Virgin Islands for the dye indigo:—Florida; Jamaica; Cuba; Hispaniola; St. Martin to Grenada; Curaçao. Native of the Old World tropics.

4. *Indigofera sumatrana* Gaertn. Fr. & Sem. 2: 317. 1791.

A shrub, similar to *I. tinctoria*, about as large, the slender twigs minutely pubescent, the leaves of about the same size. Leaflets 7–11, obovate, pubescent on both sides; racemes 3–8 cm. long; corolla reddish, about 5 mm. long; pod linear, about 3 cm. long and 2.5 mm. wide, strongly curved, 8–12-seeded.

Thickets and roadsides. St. Thomas; St. Jan; Virgin Gorda:—Jamaica; Venezuela. Native of tropical Asia.

8. *PAROSELA* Cav. Descr. Pl. 185. 1802.

Herbs, or sometimes shrubs, with usually glandular-punctate foliage, odd-pinnate leaves, minute stipules, and small flowers in terminal or lateral spikes or racemes. Calyx-teeth nearly equal, the tube 10-ribbed, campanulate; standard cordate or auriculate, clawed; wings and keel mainly exceeding the standard, adnate by their claws to the lower part of the stamen-tube; stamens 10 or 9, monadelphous; ovules 1–3; style subulate; pod included in the calyx, membranous, mostly indehiscent and 1-seeded. [Anagram of *Psoralea*.] About 170 species, natives of America. Type species: *Psoralea mutabilis* Cav.

1. *Parosela domingensis* (DC.) Millsp. Field Mus. Bot. 1: 21. 1895.

Dalea domingensis DC. Prodr. 2: 246. 1825.

Shrubby, usually much-branched, 5 dm.–2 m. high, the slender branches ascending, the young twigs pubescent. Leaves 3–6 cm. long, short-petioled; leaflets 7–15, oblong to obovate, 5–13 mm. long, some pubescent or glabrous, rather copiously black-dotted, retuse or rounded at the apex, narrowed or obtuse at the base; spikes many, dense, oval, 1–2 cm. long; bracts ovate-oblong, acuminate, deciduous; calyx about 1 cm. long, its setaceous plumose teeth about as long as the ridged, campanulate tube; corolla purple to white, a little longer than the calyx, the standard cordate; pod about as long as the calyx-tube. [*Dalea phymatodes* of Eggers, not of Willdenow; the Porto Rico plant was referred by Rydberg to *P. emphysoles* (Jacq.) Rydb.]

Fields, hillsides and thickets at low elevations in the dry southern districts of Porto Rico; St. Jan:—Cuba; Hispaniola; northern South America.

9. *CRACCA* L. Sp. Pl. 752. 1753.

[*TEPHROSIA* Pers. Syn. 2: 328. 1807.]

Herbs, sometimes slightly shrubby, with odd-pinnate and punctate leaves, and purple, red or white flowers in racemes or short clusters. Stipules small; leaflets entire. Calyx-teeth usually nearly equal. Petals all clawed; standard orbicular or broadly ovate; wings obliquely obovate or oblong; keel curved; stamens monadelphous or diadelphous; ovules several or many. Pod linear, flat, 2-valved, several-seeded. [Latin, vetch.] About 120 species, mainly natives of warm and tropical regions. Type species: *Cracca villosa* L.

Prostrate or ascending; leaflets 9–15, acutish or obtuse and mucronate; corolla about 1 cm. long.

Erect; leaflets 5–9, mostly retuse; corolla 7–8 mm. long.

1. *C. cinerea*.
2. *C. cathartica*.

1. **Cracca cinerea** (L.) Morong, Ann. N. Y. Acad. Sci. 7: 79. 1892.

Galega cinerea L. Syst. ed. 10, 1172. 1759.

Tephrosia cinerea Pers. Syn. 2: 328. 1807.

Galega littoralis L. Syst. ed. 12, 497. 1767.

Tephrosia cinerea littoralis Benth. In Mart. Fl. Bras. 15: 48. 1859.

Cracca villosa cinerea Kuntze, Rev. Gen. Pl. 173. 1891.

Cracca littoralis Rydb. N. A. Fl. 24: 178. 1923.

Rootstock thick, sometimes long, woody; stems slender, usually branched, ascending, or diffuse, about 1 m. long or less, more or less pubescent. Leaves 5–8 cm. long; petioles 1.5 cm. long or less; stipules subulate; leaflets 9–15, mostly oblanceolate, sometimes narrowly oblong, 1.5–2.5 cm. long, obtuse to acutish at the apex, often mucronate, cuneate or narrowed at the base, appressed-pubescent, at least beneath; racemes few, several-flowered, peduncled, mostly opposite the leaves; calyx about 5 mm. long, its teeth acuminate; petals about twice as long as the calyx, purple or purplish, the standard about 10 mm. broad; pod 3–6 cm. long, 3.5–4 mm. wide, finely pubescent, containing 10 seeds or fewer.

Banks, thickets, sandy plains, fields and hillsides, Porto Rico, at lower and middle elevations; Mona; Icos; Vieques; Muertos; Desecheo; St. Croix; St. Thomas; St. Jan. Tortola; Virgin Gorda;—West Indies; continental tropical America. ANIL CENIZO; Races differ in pubescence, shape and size of leaflets and color of flowers.

2. **Cracca cathartica** (Sessé & Moc.) Britton & Millspaugh, Bahama Fl. 181. 1920.

Galega cathartica Sessé & Moc. Fl. Mex. ed. 2, 175. 1894.

Cracca Schottii Vail, Bull. Torr. Club 22: 25. 1895.

Tephrosia cathartica Urban, Symb. Ant. 4: 283. 1905.

Root deep, elongated; stem erect, often much branched, 8 dm. high or less, the branches ascending or diffuse, slender, tough, 2–4 dm. long. Leaves 5–8 cm. long; petioles slender, 2 cm. long or less; stipules linear-subulate; leaflets 5–9, oblong-obovate, 1.5–4 cm. long, appressed-pubescent on both sides or glabrate above, mostly retuse at the apex, narrowed at the base; racemes terminal and opposite the leaves, few-flowered, short or elongated; calyx about 4 mm. long; its teeth acuminate; petals purple or red-purple, the standard about 8 mm. broad; pod 3–4 cm. long, 4–5 mm. wide, 5–7-seeded. [*Tephrosia leptostachya* of Bello, not of Linnaeus; *Cracca leptostachys* of Cook and Collins.]

In sandy soil at lower elevations near the coasts of Porto Rico; Virgin Gorda;—Bahamas; Hispaniola; Saba; St. Eustatius; St. Kitts; Cayman Islands; Colombia. Sometimes cultivated, ANIL RACEMILLO.

Cracca caudida (Roxb.) Kuntze, of southern Asia, was recorded by Krebs as found in St. Thomas. It is an erect plant with large white flowers about 2 cm. broad, established in Jamaica and St. Kitts [*Kierseria sericea* Reinw.].

Cracca purpurea L. [*Galega purpurea* L.] was formerly cultivated on St. Croix, according to West, and is listed as occurring in Porto Rico by Cook and Collins. It is shrubby, 6 dm. high or less, glabrate, the leaves with 13–21 narrowly oblong or oblanceolate leaflets, finely silky beneath, the flowers in short racemes, the calyx minutely pubescent, the pod 3–4 cm. long, glabrous or strigillose. It is native of the East Indies.

Cracca brevipes (Benth.) Kuntze [*Cytisus sessiliflorus* Poir.; *Tephrosia brevipes* Benth.] was attributed to Porto Rico by Poiret, in error; the plant inhabits Trinidad and northern South America.

10. **BARBIERIA** DC. Mem. Leg. 6: 241. 1825.

A slender shrub, or woody vine, with unequally pinnate, thin leaves, narrowly triangular-lanceolate stipules, setaceous stipels and oblong leaflets, the large

red flowers in short terminal and axillary, long-peduncled racemes. Calyx long-tubular, its long narrow teeth nearly equal. Standard oblong, long-clawed; wings oblong, adnate to the keel; keel blunt, nearly as long as the standard. Stamens monadelphous, 1 free, 9 united; anthers all alike. Ovary many-ovuled, sessile; style slender, longitudinally bearded on the inner side; stigma small, terminal. Pod linear, straight, flat, 2-valved, septate between the black transverse oblong seeds. [Commemorates J. B. G. Barbier, French pharmacologist.] A monotypic genus of the West Indies and South America.

1. **Barbieria pinnata** (Pers.) Baill, Hist. Pl. 2: 263. 1870.

Galactia pinnata Pers. Syn. 2: 302. 1807.

Clitoria polyphylla Poir. in Lam. Encycl. Suppl. 2: 300. 1811.

Barbieria polyphylla DC. Mem. Leg. 242, pl. 39. 1825.

Much-branched, the slender, elongated branches villous-pubescent when young. Leaves 1–2 dm. long; stipules about 1 cm. long; petioles 1–2 cm. long; leaflets 13–21, 5 cm. long or less, 10–17 mm. wide, thin, obtuse at each end, mucronate, dark green and glabrous, or nearly so above, appressed-pubescent and pale beneath, the filiform-setaceous stipels 4–6 mm. long; peduncles slender, pubescent, 4–10 cm. long; racemes few-flowered; calyx about 3 cm. long, villous, the long-acuminate teeth about half as long as the tube; standard about 5 cm. long; pod about as long as the standard, 6 mm. wide, pilose.

Thickets and hillsides at lower and middle elevations in moist districts, Porto Rico:—Cuba; Hispaniola; Central and South America. ENREDADERA.

11. **GLIRICIDIA** H. B. K. Nov. Gen. 6: 393. 1823.

Trees or shrubs with unequally pinnate leaves, small stipules, entire stalked leaflets without stipels, and rather large pink or rose-colored flowers in lateral or axillary racemes. Calyx obliquely campanulate, its teeth short, broad, the two upper ones partly united. Standard broad, reflexed; wings oblong, curved, distinct; keel incurved, blunt. Stamens diadelphous (1 and 9); anthers all alike. Ovary stipitate; ovules numerous; style subulate, inflexed; stigma small, terminal. Pod flat, broadly linear, dehiscent, continuous, its valves coriaceous. [Greek, mouse-killer.] About 4 species, of tropical America, the following typical.

1. **Gliricidia sepium** (Jacq.) Steud. Nom. 688. 1841.

Robinia sepium Jacq. Enum. 28. 1760.

Lonchocarpus maculatus DC. Prodr. 2: 260. 1825.

A tree, up to 10 m. high, the young twigs silky-pubescent. Leaves 4 dm. long or less; petioles 1–4 cm. long; leaflets 7–17, ovate to ovate-lanceolate, 3–7 cm. long, sparsely short-pubescent, or glabrate, obtuse to acuminate at the apex, rounded or narrowed at the base, their rather stout stalks pubescent; racemes commonly numerous, 10–15 cm. long; calyx about 5 mm. long; standard 1.5–2 cm. long; ovary glabrous; pod 10–20 cm. long, 1–2 cm. wide.

Recorded as spontaneous near Añasco, Porto Rico; occasionally planted for ornament in Porto Rico and the Virgin Islands. Native of Central America and northern South America. Naturalized in Jamaica, Cuba, Hispaniola, Trinidad and Curaçao.

12. **SABINEA** DC. Ann. Sci. Nat. I. 4: 92. 1825.

Shrubs or small trees, with equally pinnate leaves, the rachis terminating in a tip, the small leaflets entire, short-stalked, and rather large pink to rose-colored flowers solitary or clustered on twigs or branches of previous seasons. Calyx

thin, turbinate or campanulate, nearly truncate. Standard broad; wings oblong, somewhat curved; keel inflexed, blunt. Stamens diadelphous (1 and 9), equal in length or 5 of them shorter than the others; anthers all alike. Ovary stipitate, many-ovuled; style very slender, incurved or nearly straight; stigma small and terminal. Pod narrowly linear, stipitate, continuous, dehiscent, its thin valves twisting; seeds compressed. [Commemorates J. Sabine, English botanist.] Three known species, the following, and one in Dominica. Type species: *Robinia florida* Vahl.

The 5 posterior stamens half as long as the others; style incurved; calyx turbinate; flowers lavender.

Stamens all of nearly the same length; style nearly straight; calyx campanulate; flowers pink to carmine.

1. *S. florida*.

2. *S. punicea*.

1. **Sabinea florida** (Vahl) DC. Ann. Sci. Nat. I. 4: 92. 1825.

Robinia florida Vahl; West, Bidr. St. Croix 300. 1793.

A small tree, up to 6 m. in height, the young twigs appressed-pubescent, the branches wand-like. Stipules lanceolate-subulate, 4–6 mm. long; leaves 4–11 cm. long, short-petioled; leaflets 5–15 pairs, oblong or elliptic, or the end pair obovate-oblong, 8–15 mm. long, obtuse at both ends, mucronulate, plunately few-veined, glabrous above, sparingly appressed-pubescent or glabrous beneath, the slender rachis channelled on the upper side; pedicels mostly clustered at the nodes, nearly filiform, 6–10 mm. long; calyx broadly turbinate, about 5 mm. long; flowers lavender to pale purple; standard 1.5–1.8 cm. broad; wings obovate, 1.5–2 cm. long, short-clawed; keel obliquely obovate, the tip heliotrope colored; stamens of two lengths, 5 of them about half as long as the others; style strongly incurved; pod slender-stipitate, 7–10 cm. long, 4–7 mm. wide. [*Sabinea dubia* DC. in part.]

Thickets, banks and hillsides at lower and middle elevations in moist districts of Porto Rico; Culebra; Vieques; St. Thomas; St. Jan; Tortola; Virgin Gorda. Endemic. Occasionally planted for ornament and very decorative, its long branches crowded with the beautiful fugacious flowers. RETAMA. WATTAPAMA.

2. **Sabinea punicea** Urban, Symb. Ant. 1: 323. 1899.

A shrub, up to 2 m. high, the young twigs pubescent or glabrate. Foliage closely similar to that of the preceding species; leaves 10 cm. long or less; leaflets 5–10 pairs; oblong to obovate-oblong, obtuse at both ends or retuse at the apex, mucronulate, firm in texture and reticulate-veined; pedicels filiform, mostly clustered, about 10 mm. long; flowers pink to carmine; calyx campanulate, about 5 mm. long, oblique; standard 13–15 mm. broad; wings oblong, 1.5–2 cm. long; keel oblong; stamens all of nearly the same length; style nearly straight; pod slender, stipitate, 6–9 cm. long, 5–7 mm. wide. [*S. florida* of Bello, not of de Candolle.]

Shaded banks, hillsides and ravines at lower and middle elevations in moist parts of the central and western districts of Porto Rico. Endemic. CARACOLILLO.

13. **CORYNELLA** DC. Ann. Sci. Nat. I. 4: 93. 1825.

Shrubs, with pinnate leaves, and rather small, violet blue or purple flowers in lateral clusters or solitary, appearing with or before the leaves of the season, the stipules subulate, small and rigid. Calyx campanulate, its teeth short or subulate, the 2 upper connate. Standard ovate or suborbicular, clawed, reflexed; wings lanceolate to elliptic; keel curved, its petals partly united. Stamens diadelphous (1 and 9); anthers all alike. Ovary stipitate, many-ovuled; style slender, hooked at the apex, stigmatic on the inner side below the apex. [Greek, a little

club.] Two or three species, natives of the West Indies. Type species: *Robinia polyantha* Sw.

1. **Corynella pauciflora** DC. Ann. Sci. Nat. I. 4: 93. 1825.

A shrub, 2 m. high or less, with slender branches, the young twigs pubescent. Stipules stiff, 3–4 mm. long; leaves 2–4 cm. long, short-petioled, evenly pinnate, the rachis sparingly pubescent, channelled above; leaflets 3–5 pairs, oblong or obovate, 5–15 mm. long, pubescent on the midvein beneath when young, soon glabrous, shining and reticulate-veined above, obtuse or acutish and mucronulate at the apex, narrowed or rounded at the base; flowers violet, commonly numerous and clustered on the old twigs; pedicels slender, pubescent, 3–6 mm. long; calyx pubescent, its teeth short; standard suborbicular, about 8 mm. broad; wings elliptic; keel-petals obtuse at the apex; style a little thickened upward; pod linear, narrowed below, about 5 cm. long and 7 mm. wide.

Thickets, banks and hillsides at lower elevations in dry parts of the southern districts of Porto Rico.—Hispaniola. RETAMA.

14. **BENTHAMANTHA** Alefeld, Bonplandia 10: 264. 1862.

Slender shrubs or somewhat woody perennial herbs, with unevenly pinnate leaves, the stipules subulate, the leaflets minutely stipellate, and rather large white or yellowish flowers, few in axillary racemes. Calyx 5-cleft, the narrow lobes nearly equal. Standard orbicular, or broader than long, reflexed; wings obovate-oblong; keel broad, incurved, acute or beaked. Stamens diadelphous (1 and 9); anthers alike. Ovary sessile, many-ovuled; style incurved, longitudinally bearded on the inner side; stigma terminal. Pod narrowly linear, nearly flat, sessile in the calyx, 2-valved, septate between the seeds. [In honor of George Bentham, 1800–1884, a distinguished British taxonomist.] About 6 species, of tropical and warm temperate America. Type species: *Cracca glandulifera* Benth.

1. **Benthamantha caribaea** (Jacq.) Kuntze, Rev. Gen. Pl. 3^e: 53. 1898.

Galega caribaea Jacq. Sel. Amer. 212. 1763.

Tephrosia caribaea DC. Prodr. 2: 251. 1825.

Tephrosia aniloides Bello, Anal. Soc. Hisp. Hist. Nat. 10: 258. 1881.

Cracca caribaea Benth.; Oerst. Kjob. Vid. Med. 1853: 9. 1853.

Cracca aniloides Cook & Collins, Contr. U. S. Nat. Herb. 8: 128. 1903.

Brittonamra caribaea Kuntze, Rev. Gen. Pl. 164. 1891.

A shrub, 2 m. high or less, the branches very slender, appressed-pubescent when young. Stipules 4–7 mm. long; leaves 5–12 cm. long, short-petioled; leaflets 13–19, thin, 1–3 cm. long, oblong, acutish or obtuse and mucronate at the apex, mostly obtuse at the base, appressed-pubescent and pale beneath, sparingly pubescent and green above; peduncles slender, as long as the leaves or shorter; flowers few, white, purple-veined; calyx-lobes longer than the tube; standard about 1 cm. broad; wings nearly as long as the standard; pod 4–6 cm. long, 2.5–3 mm. wide, finely pubescent, its sutures slightly thickened, impressed between the nearly quadrate seeds.

Thickets, banks and hillsides at lower elevations, Porto Rico, mostly in dry districts; Culebra; Desecheo; St. Croix; St. Thomas; Tortola.—Hispaniola; St. Martin to Trinidad; Central America and northern South America. ANIL FALSO.

15. **SESBAN** Adans. Fam. Pl. 2: 327. 1763.

Herbs or shrubs, with evenly pinnate leaves, the leaflets numerous, entire, not stipellate, or the stipels minute. Flowers in axillary racemes, the slender

pedicels with 2 deciduous bractlets under the calyx. Calyx campanulate, nearly equally 5-toothed. Standard broad, ovate or orbicular; wings oblong, falcate; keel blunt. Stamens diadelphous (9 and 1). Ovary mostly stipitate, many-ovuled; style glabrous; stigma small. Pod elongated-linear, wingless, compressed, partitioned between the oblong seeds. [Name Arabic.] About 15 species, natives of warm and tropical regions. Type species: *Aeschynomene Sesban* L.

Leaves silky-pubescent beneath.

1. *S. sericea*,

Leaves glabrous.

Calyx 4-5 mm. long; corolla less than 1.5 cm. long; pod torulose.

2. *S. Sesban*,

Calyx 6-7 mm. long; corolla 1.5-2 cm. long; pod not torulose.

3. *S. emerus*.

1. **Sesban sericea** (Willd.) DC. Prodr. 2: 266. 1825.

Coronilla sericea Willd. Enum. 773. 1809.

Stem slightly woody, 1-2 m. tall, silky-pubescent, at least above. Leaves 1-2.5 dm. long, the rachis pubescent; leaflets 10-20 pairs, linear-oblong, 1.5-2.5 cm. long, obtuse and mucronate at the apex, usually densely silky-pubescent beneath, glabrous or nearly so above, sometimes nearly glabrous on both sides; peduncles few-flowered, much shorter than the leaves; pedicels very slender, 1 cm. long or less; calyx about 4 mm. long, its teeth triangular, very acute; wings yellow; standard 10-12 mm. long, yellow, brown-spotted; pod 10-16 cm. long, biconvex, 3 mm. wide, short-beaked, not constricted between the seeds.

Wet grounds at lower elevations, Porto Rico; St. Croix; St. Thomas;—Bahamas; Hispaniola; Jamaica; Antigua to Martinique; Trinidad.

2. **Sesban Sesban** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 54. 1918.

Aeschynomene Sesban L. Sp. Pl. 714. 1753.

Sesbania aegyptiaca Pers. Syn. 2: 316. 1807.

Shrubby, branched, 1.5-3 m. high, finely pubescent above when young, or glabrous. Leaves 8-15 cm. long; leaflets 10-20 pairs, narrowly oblong, 1.5-2.5 cm. long, pale green, obtuse at each end, mucronulate at the apex; racemes commonly as long as the leaves or longer, several-flowered; pedicels very slender, about 1 cm. long; calyx broadly campanulate, 4-5 mm. long, its short triangular teeth acute; corolla 1.2-1.5 cm. long, the petals variously colored, the standard yellow to white, sometimes streaked with red, purple, orange or scarlet; pod 1-2 cm. long, about 3 mm. thick, torulose.

Waste grounds, Porto Rico, sparingly naturalized after planting; planted on St. Croix. Native of the Old World tropics. Introduced by cultivation into Jamaica, Cuba, St. Kitts and Guadeloupe.

3. **Sesban emerus** (Aubl.) Urban, Report. 16: 149. 1919.

Aeschynomene emerus Aubl. Pl. Gulan. 2: Tab. noms. 1; 775 no. 4. 1775.

Sesbania occidentalis Pers. Syn. 2: 316. 1807.

Coronilla occidentalis Willd. Sp. Pl. 3: 1147. 1803.

Emerus Sesban occidentalis Kuntze, Rev. Gen. Pl. 181. 1891.

Shrubby, 3 m. high or less, branched, glabrous, or sparingly pubescent above when young. Leaves 1-2 dm. long; leaflets 10-20 pairs, linear-oblong, obtuse at both ends, 1.5-2.5 cm. long, mucronate at the apex; racemes shorter than the leaves, few-several-flowered; pedicels slender, 8-12 mm. long; calyx broadly campanulate, 6-7 mm. long, its triangular teeth very acute; corolla about 2 cm. long, the standard yellow; purple-dotted; pod 1.5-2.5 dm. long, 2-3 mm. wide, biconvex, slightly constricted between the seeds when young.

In lakes and ditches at low elevations in the southern and western districts of Porto Rico;—Bahamas; Hispaniola; Cuba.

16. **AGATI** Adans. Fam. Pl. 2: 320. 1763.

Rapid-growing and short-lived small trees or shrubs, with equally pinnate leaves of many pairs of oblong, entire leaflets, and large, variously colored flowers in axillary racemes. Calyx large, campanulate, its lobes short and broad. Standard ovate to oblong; wings narrow, longer than the standard; keel-petals curved, separate at base and apex. Stamens diadelphous (1 and 9); anthers alike. Ovary stipitate; style subulate, curved, the small terminal stigma capitate; pod linear, elongated, flat, septate between the seeds. [Malabar name.] A monotypic genus.

1. **Agati grandiflora** (L.) Desv. Journ. Bot. 1: 120. 1813.

Aeschynomene grandiflora L. Sp. Pl. 1060. 1753.

Sesban grandiflorus Poir. in Lam. Encycl. 7: 127. 1806.

Agati coccinea Desv. Journ. Bot. 1: 120. 1813.

A tree, up to 12 m. high, with a trunk up to 3 dm. thick, glabrous or very nearly so throughout, or the young foliage finely pubescent, the bark rough. Leaves 2-3.5 dm. long, short-petioled. Leaflets 10-30 pairs, oblong, 2-4 cm. long, obtuse or retuse at the apex, inequilaterally narrowed at the base; racemes 2-5-flowered, shorter than the leaves; calyx 2-2.5 cm. long, its broadly triangular lobes much shorter than the tube; corolla red to white, 6-10 cm. long; pod 2-4 dm. long, about 8 mm. wide, beaked at the apex, narrowed at the base into a long, stout stipe.

Roadsides and thickets, spontaneous after cultivation in Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—native of tropical Asia. Widely distributed by cultivation in southern Florida and the West Indies. The nearly white wood is soft and light. GALLITO. CRESTA DE GALLO. BÁCULO.

17. **PICTETIA** DC. Ann. Sci. Nat. I. 4: 93. 1824.

Shrubs or small trees, with unequally pinnate leaves, the leaflets bristle-tipped, estipellate, the stipules spiny or rigid, the yellow flowers in axillary, long or short racemes. Calyx campanulate, many-veined, its teeth somewhat unequal, obtuse or acute, the lower one longer than the others. Standard nearly orbicular, recurved; keel blunt, shorter than the obliquely oblong wings. Stamens diadelphous (1 and 9); anthers all alike, versatile. Ovary stipitate, muriculate; style slender, glabrous, incurved; stigma small and terminal. Pod linear or oblong, few-jointed, indehiscent. [Commemorates Marc Auguste Pictet, 1752-1825.] Four known species, natives of the West Indies, the following typical.

1. **Pictetia aculeata** (Vahl) Urban. Symb. Ant. 2: 294. 1900.

Robinia aculeata Vahl; West, Bidr. St. Croix 300. 1793.

Robinia squamata Vahl, Symb. 3: 88. pl. 69. 1794.

Aeschynomene aristata Jacq. Hort. Schoenb. 2: 59. pl. 237. 1797.

Pictetia squamata DC. Ann. Sci. Nat. I. 4: 94. 1825.

Pictetia aristata DC. Ann. Sci. Nat. I. 4: 94. 1825.

A shrub or a small tree, up to 10 m. high, the trunks often clustered, the branches upright, the old bark separating in large flakes, the young twigs and leaves finely pubescent, becoming glabrous or nearly so. Stipules rigid, spinescent, lanceolate to lance-subulate, 6-12 mm. long; leaves 6-12 cm. long; leaflets 9-25, orbicular-obovate, 1-2 cm. long, mostly as wide as long, obovate or subtruncate at the apex and bristle-tipped, pinnately few-veined, obtuse or subcordate at the base; racemes as long as the leaves or shorter, several-flowered.

pedicels filiform, 1–2.5 cm. long; calyx 5–6 mm. long; standard about 2 cm. long and broad; pod short-stipitate, linear, slightly curved, 2–5 cm. long, about 6 mm. wide, 2–6-jointed, the joints longer than wide.

Thickets and hillsides at lower and middle elevations, southern and eastern districts of Porto Rico, extending up the western coast to Punta Guaniquilla; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Aneгада;—Hispaniola. TACHUELO. KARREBESU. Called FUSTIC in the Virgin Islands.

18. **AESCHYNOMENE** L. Sp. Pl. 713. 1753.

Herbs, or in tropical regions shrubs, mainly with odd-pinnate leaves, the leaflets sensitive in some species, and yellow flowers in axillary clusters. Calyx-teeth nearly equal, more or less united into 2 lips. Standard orbicular, short-clawed; wings oblong or obliquely obovate, about as long as the standard; keel curved. Stamens diadelphous (5 and 5); anthers all alike. Ovary stipitate; ovules 2–∞. Pod stalked, flat, jointed. [Greek, to be ashamed, referring to the sensitive leaves.] About 55 species, in warm and tropical regions. Type species: *Aeschynomene aspera* L.

Pod deeply crenate on the lower margin, its joints nearly semi-circular or semioval.

Erect; leaflets 10–30 pairs, linear.

Prostrate or trailing; leaflets 3–5 pairs, obovate or oval.

Pod slightly crenate on one margin or both margins, its joints subquadrate.

1. *A. americana*.

2. *A. portoricensis*.

3. *A. sensitiva*.

1. **Aeschynomene americana** L. Sp. Pl. 713. 1753.

Aeschynomene glandulosa Poir. in Lam. Encycl. Suppl. 4: 76. 1816.

Aeschynomene villosa Poir. in Lam. Encycl. Suppl. 4: 76. 1816.

Aeschynomene americana depila Millsp. Field Mus. Bot. 1: 494. 1902.

Aeschynomene americana villosa Urban, Symb. Ant. 4: 288. 1905.

Herbaceous, or slightly woody; stem erect, 3 dm.–2 m. high, glabrous, or more or less villous, and sometimes glandular. Stipules half-sagittate, triangular-lanceolate, striate, long-acuminate, 12 mm. long or less; leaves 3–7 cm. long, very short-petioled; leaflets 10–30-pairs, linear, glabrous or ciliate, 4–6-nerved, mucronate and sometimes denticulate at the apex, obliquely rounded at the base, 7–10 mm. long, about 2 mm. wide; racemes few-flowered; calyx 2-lipped, about 4 mm. long; corolla yellow, sometimes brownish-striped or nearly white, 6–8 mm. long; pods short-stipitate, straight or a little curved, 4 cm. long or less, glabrous or pubescent, 2–8-jointed, the upper margin continuous and nearly straight, the lower deeply crenate, the joints nearly semicircular, 2–3 mm. long.

Moist banks, rocks, hillsides and fields at lower and middle elevations. Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Jamaica; Cuba to St. Kitts, Barbados and Tobago; continental tropical America. YERBA ROSARIO.

2. **Aeschynomene portoricensis** Urban, Symb. Ant. 1: 325. 1899.

Branches several or many from a woody root, slender, spreading or prostrate, 1–10 dm. long, villous, glabrate or puberulent. Stipules ovate-lanceolate or lanceolate, striate, acuminate, 3 mm. long or less; leaves 1–2 cm. long, short-petioled; leaflets 3–5 pairs, oval to obovate, thin, pinnately few-veined, 5–8 mm. long, obtuse and apiculate at the apex, obliquely obtuse or subcordate at the base, sparingly appressed-pubescent or glabrate; peduncles almost filiform; racemes 1–2 cm. long, 1–4-flowered, the pedicels filiform; calyx about 2.5 mm. long, pubescent, its teeth acute; corolla light yellow, about 5 mm. long; pod filiform-stipitate, 10–15 mm. long, about 3 mm. wide, curved, 2–4-jointed, minutely pubescent, its upper margin continuous, the lower deeply crenate, the joints obliquely semi-oval.

Hillsides and moist sandy soil, at lower elevations, northern and western districts of Porto Rico. A single specimen with young fruit was found on a grassy hillside at Aibonito, apparently a waif. Endemic.

3. **Aeschynomene sensitiva** Sw. Prodr. 107. 1788.

Aeschynomene fistulosa Bello, Ap. 1: 259. 1881.

Shrubby but not very woody, erect, branched, 1-4 m. high, glabrous or sparingly pubescent above. Leaves 2-10 cm. long; stipules membranous, 10 mm. long or less, half-sagittate, early deciduous; leaves 2-10 cm. long; leaflets 10-20 pairs, linear or linear-oblong, obscurely pinnately few-veined with the midvein rather prominent, 5-9 mm. long, obtuse and often mucronulate at the apex, obliquely obtuse at the base; peduncles slender, 1-2.5 cm. long, few-flowered; calyx deeply cleft, 3-4 mm. long; corolla yellow or reddish-veined, 8-10 mm. long; pod stipitate, straight or a little curved, glabrous or nearly so, 5 cm. long or less, 3.5-5 mm. wide, both margins usually slightly crenate, the subquadrate joints 4-10.

Wet grounds and in water, Porto Rico, at lower and middle elevations; St. Thomas (ex Krebs); Tortola:—Cuba to Porto Rico, Guadeloupe and Trinidad; continental tropical America and tropical Africa. YERBA DE CIENEGA.

19. **STYLOSANTHES** Sw. Prodr. 108. 1788.

Perennial herbs, sometimes woody, with pinnately 3-foliate, stipulate leaves, the leaflets entire and estipellate, and small yellow flowers. Calyx-tube elongated, its 4 upper lobes more or less united, the fifth (lower) lobe separate. Petals and stamens borne at the top of the calyx-tube; standard nearly orbicular; wings oblong, distinct; keel incurved. Filaments united into a tube; anthers alternately longer and shorter, the shorter ones versatile. Ovary nearly sessile, containing 2 or 3 ovules; style elongated, the lower part persistent on the pod and hooked or recurved. Loment 1-2-jointed, the joints reticulated. [Greek, column-flower, referring to the calyx-tube.] About 30 species, mostly of tropical distribution, the following typical.

1. **Stylosanthes hamata** (L.) Taubert, Mon. Stylos. 22. 1889.

Hedysarum hamatum L. Syst. ed. 10, 1170. 1759.

Stylosanthes procumbens Sw. Prodr. 108. 1788.

Somewhat pubescent, branched, the branches spreading or ascending, 0.5-5 dm. long. Stipules adnate to the petioles, with free subulate apices. Leaflets oblong, elliptic or narrowly oblong, longer than the petioles, 17 mm. long or less, nearly glabrous, acute at both ends or the apex obtuse, strongly pinnately veined, mucronate; flowers about 6 mm. wide, in short, dense, bracted spikes; loment commonly 2-jointed, the persistent, hooked style-base pubescent.

Fields, hills and banks at lower and middle elevations, Porto Rico; Mona; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Florida; West Indies; tropical continental America. Races differ in size and shape of leaflets. ZARZABACOA ENANA. PENCIL-FLOWER.

Stylosanthes viscosa Sw., recorded by West from St. Croix, and by Krebs from St. Thomas, was regarded by Baron Eggers as, perhaps, a mistake for the preceding species, and this is the more probable because the plant has not been found by recent collectors either in the Virgin Islands or Porto Rico.

20. **ARACHIS** L. Sp. Pl. 741. 1753.

Herbs, with evenly pinnate leaves, the stipules adnate to the lower part of the petiole, the yellow flowers in axillary bracted clusters. Calyx-tube slender,

its 4 upper lobes united, the fifth (lower) one separate. Petals and stamens borne at the top of the calyx-tube; standard nearly orbicular; wings oblong, separate; keel incurved and beaked. Filaments all united into a tube; anthers alternately longer and shorter, the shorter ones versatile. Ovary nearly sessile at flowering time, 2-3-ovuled, but after fertilization of the ovules its stalk (torus) greatly elongates, becomes deflexed, and forces the pod into the ground, where it ripens; style slender; pod oblong, reticulated, indehiscent, not jointed; seeds oblong to ovoid, the cotyledons thick and fleshy. [Greek name of some papilionaceous plant. About 7 species, natives of South America, the following typical.

1. *Arachis hypogaea* L. Sp. Pl. 741. 1753.

Annual, loosely pilose, 6 dm. high or less. Stipules lanceolate, long-acuminate, 1-3 cm. long; petioles 1-5 cm. long; leaflets 2 pairs, sessile, elliptic-obovate, rounded or retuse and minutely apiculate at the apex, narrowed at the base, 5 cm. long or less; corolla about 12 mm. broad; torus elongating to several inches, becoming stiff, and forcing the ripening ovary into the earth, where it ripens the well-known peanuts.

Spontaneous after cultivation, Porto Rico and the Virgin Islands. Widely cultivated in tropical and warm temperate regions, its origin unknown, but probably from Brazil. PEA-NUT, MANI, PINDELS, GROUND-NUT.

21. *ZORNIA* Gmel. Syst. 2: 1096. 1791.

Perennial herbs, sometimes a little woody, with 2-foliolate or 4-foliolate leaves, the leaflets estipellate, the small flowers in terminal or axillary bracted spikes, or solitary. Calyx campanulate, its 2 upper teeth united, the 2 lateral ones smaller, the lower one oblong-lanceolate, nearly as long as the upper. Standard nearly orbicular, clawed; wings oblong or obovate, oblique; keel somewhat beaked, incurved. Filaments all united into a tube; anthers alternately longer and shorter, the shorter ones versatile. Ovary sessile, several-ovuled; style very slender; stigma small and terminal. Loment flat, articulated, the upper suture nearly straight, the lower sinuate, the joints indehiscent. [In honor of Johann Zorn, German botanist and pharmacist.] About 10 species, of tropical and warm temperate America and Africa. Type species: *Anonymos bracteata* Walt.

1. *Zornia diphylla* (L.) Pers. Syn. 2: 318. 1807.

Hedysarum diphyllum L. Sp. Pl. 747. 1753.

Zornia reticulata Smith in Rees Cyclop. 39: no. 2. 1818.

Deep-rooted, diffusely branched, the branches rather stiff, slender, spreading or ascending, 2-5 dm. long. Stipules lanceolate, acuminate, half-sagittate, 8-20 mm. long; petioles slender, 1-2 cm. long; leaflets a single pair, inequilateral, oblong-lanceolate, very short-stalked, acute or acuminate; glabrous or nearly so, 1.5-3.5 cm. long; flowers pale yellow, in elongated bracted peduncled spikes; bracts foliaceous, oblong and half-sagittate, strongly parallel-veined, ciliate, 6-12 mm. long, almost concealing the purplish or yellowish flowers; loment pubescent and hispid, shorter than the bracts.

Dry fields and hillsides at lower elevations, Porto Rico; St. Thomas; St. Croix (according to de Candolle);—Jamaica; Cuba; Hispaniola; St. Eustatius to Trinidad; continental tropical America and Old World tropics. ZARZABOJA DE DOS HOJAS.

22. **MEIBOMIA** Heist.; Fabr. Enum. Pl. Hort. Helmst. 168. 1759.

Perennial herbs, sometimes woody at base, rarely annuals, with stipellate, 3-foliate or in some species 1- or 5-foliate leaves, and small flowers in racemes or panicles. Calyx-tube short, its teeth more or less united into 2 lips, the upper one 2-toothed, the lower teeth acute or attenuate. Standard oblong, ovate or orbicular, narrowed or rarely clawed at the base; wings obliquely oblong; keel nearly straight, obtuse. Stamens monadelphous or diadelphous (9 and 1); anthers all alike. Ovules 2- ∞ . Loment flat, 2-several-jointed, the joints mainly coriaceous and pubescent or muricate, indehiscent or rarely partially dehiscent, readily separable. [Named for Dr. Brandus Meibom; died at Helmstadt, 1740.] About 160 species, natives of warm and temperate regions, called ТИСК-ТРЕФОИЛ and ЗАРЗАБАСА. Type species: *Hedysarum canadense* L.

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| Flowers in short terminal racemes; calyx long-pilose. | 1. <i>M. barbata</i> . |
| Flowers in long racemes or panicles; calyx not long-pilose. | |
| Upper suture of the loment straight or nearly so, the lower margin deeply undulate and intruded. | |
| Erect or ascending; racemes terminal. | |
| Lower margin of the loment undulate to about the middle; bracts large. | 2. <i>M. adscendens</i> . |
| Lower margin of the loment undulate nearly to the upper suture; bracts small. | |
| Flowers purple; stipules connate at base. | 3. <i>M. supina</i> . |
| Flowers white; stipules distinct or nearly so, subcordate. | 4. <i>M. affinis</i> . |
| Trailing or creeping, rooting at the nodes; racemes axillary. | 5. <i>M. axillaris</i> . |
| Leaflets obtuse or acutish. | 6. <i>M. umbrosa</i> . |
| Leaflets acuminate or sharply acute. | 7. <i>M. Sintenisii</i> . |
| Stem and petioles densely pilose. | 8. <i>M. Wydleriana</i> . |
| Stem and petioles glabrous or merely puberulent. | 9. <i>M. scorpiurus</i> . |
| Leaflets ovate, rounded at the base, firm in texture. | 10. <i>M. mollis</i> . |
| Leaflets triangular-ovate, truncate or subcordate, membranous. | 11. <i>M. purpurea</i> . |
| Both sutures of the loment undulate. | 12. <i>M. procumbens</i> . |
| Joints of the narrow loment linear-oblong. | |
| Joints of the loment orbicular or oval. | |
| Loment 2-jointed; upper joint much longer than the lower. | |
| Loment several-jointed, the joints all alike, twisted. | |
| Perennial; loment-joints straight when mature. | |
| Annual; loment-joints permanently twisted. | |

1. **Meibomia barbata** (L.) Kuntze, Rev. Gen. Pl. 195. 1891.

Hedysarum barbatum L. Syst. ed. 10, 1170. 1759.

Nicolsonia barbata DC. Mem. Leg. 7: 313. 1825.

Desmodium barbatum Benth. Kjoeb. Vidensk. Medd. 1853: 18. 1853.

Ascending or erect, branched, 2-6 dm. high, somewhat woody, the branches pubescent. Stipules narrowly lanceolate, long-acuminate, about half as long as the petioles; petioles shorter than the leaves; stipels subulate; leaflets 3, oblong to elliptic-obovate, 2 cm. long or less, obtuse and mucronulate at the apex, glabrous or nearly so above, appressed-pubescent and reticulate-veined beneath; racemes terminal, rather dense, 1-3 cm. long; pedicels very slender, 2-3 times as long as the ovate-lanceolate, acuminate bracts; calyx at length nodding, pilose with long, brown hairs; corolla blue-purple, little longer than the calyx; loment 2-4-jointed, 1-1.6 mm. long, the upper suture continuous, the lower deeply undulate, the joints finely pubescent.

Fields and banks at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Martinique; St. Lucia; Tobago; Trinidad; continental tropical America. Introduced into the Old World tropics.

2. *Meibomia adscendens* (Sw.) Kuntze, Rev. Gen. Pl. 195. 1891.

Hedysarum adscendens Sw. Prodr. 106. 1788.

Desmodium adscendens DC. Prodr. 2: 332. 1825.

Stems diffuse or ascending, sometimes rooting at the nodes, 1 m. long or less, the ascending branches loosely pilose, 3-6 dm. high, somewhat woody. Stipules distinct, lanceolate, acuminate, as long as the petioles or shorter; leaflets 3, elliptic to obovate, 1-3 cm. long, glabrous above, appressed-pubescent beneath, obtuse, or acutish; racemes 3-20 cm. long; pedicels filiform, ascending, 8-15 mm. long; bracts lanceolate, acuminate, villous, about 7 mm. long, deciduous; calyx about 5 mm. long, deeply cleft, its teeth linear-lanceolate; corolla purple to white, about twice as long as the calyx; loment 3-6-jointed, 2 cm. long or less, its upper suture continuous, the lower margin undulate to about the middle, the oblong joints pubescent.

Banks, thickets and woodlands at lower and middle elevations, Porto Rico, ascending into the eastern mountains:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America; recorded from tropical Africa.

3. *Meibomia supina* (Sw.) Britton, Ann. N. Y. Acad. Sci. 7: 83. 1892.

Hedysarum supinum Sw. Prodr. 106. 1788.

Hedysarum incanum Sw. Prodr. 107. 1788.

Desmodium supinum DC. Prodr. 2: 322. 1825.

Desmodium incanum DC. Prodr. 2: 322. 1825.

Hedysarum portoricense Spreng. Syst. 3: 314. 1826.

Desmodium portoricense G. Don, Gen. Syst. 2: 294. 1832.

Desmodium incanum angustifolium Griseb. Fl. Br. W. I. 187. 1859.

Meibomia incana Cook & Collins, Contr. U. S. Nat. Herb. 8: 189. 1903.

Desmodium supinum angustifolium Urban, Symb. Ant. 4: 291. 1905.

Stems erect or ascending, somewhat woody, 3-9 dm. high, puberulent or short-pubescent. Stipules lanceolate, acuminate, connate below, or at length distinct, mostly shorter than the petioles; leaflets 3 or often only 1, various in form, mostly elliptic, but also lanceolate, obovate, nearly linear, or orbicular, sometimes several forms on the same plant, glabrous or nearly so and dark green above, finely pubescent and pale beneath, 2-7.5 cm. long; stipels subulate; racemes 2-8 cm. long; bracts linear-lanceolate, pubescent, shorter than the pedicels, deciduous; pedicels 6-12 mm. long; calyx small, about 3 mm. long, its teeth ovate-lanceolate, acute; corolla purple or purplish, 2-3 times as long as the calyx; loment 3-8-jointed, 3 cm. long or less, its upper suture continuous, the lower margin deeply undulate, the oblong joints densely pubescent.

Banks, hillsides and thickets at lower and middle elevations, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan:—West Indies; continental tropical America and tropical Africa.

4. *Meibomia affinis* (Schl.) Kuntze, Rev. Gen. Pl. 197. 1891.

Desmodium affine Schl. Linnaea 12: 312. 1838.

Desmodium albiflorum Salzm.; Benth. in Mart. Fl. Bras. 15: 99. 1859.

Meibomia albiflora Kuntze, Rev. Gen. Pl. 197. 1891.

Stems ascending or spreading, loosely pilose, 5 dm. long or less. Stipules lanceolate, subcordate, acuminate, mostly much shorter than the petioles; leaflets 3, ovate, 6 cm. long or less, acute or bluntish at the apex, obliquely obtuse or the middle one narrowed at the base, glabrous above, more or less pubescent on the veins beneath; stipels lanceolate-subulate; raceme 5-15 cm. long; pedicels filiform, 8-20 mm. long; bracts ovate, acuminate, about as long as the calyx, deciduous; calyx about 3 mm. long, its teeth lanceolate; corolla white, somewhat longer than the calyx; loment nearly sessile, 4-6-jointed, the upper suture continuous, the lower margin deeply undulate, the oblong joints densely pubescent, about 6 mm. long.

Coffee plantations near Cayey and Coamo:—Jamaica; Cuba; Hispaniola; continental tropical America.

5. *Meibomia axillaris* (Sw.) Kuntze, Rev. Gen. Pl. 195. 1891.

Hedysarum axillare Sw. Prodr. 107. 1788.

Hedysarum reptans Poir. in Lam. Encycl. 6: 442. 1804.

Desmodium axillare DC. Prodr. 2: 333. 1825.

Desmodium reptans DC. Prodr. 2: 333. 1825.

Meibomia axillaris obtusifoliola Kuntze, Rev. Gen. Pl. 195. 1891.

Desmodium axillare genuinum Urban, Symb. Ant. 2: 303. 1900.

Desmodium axillare oblongifolium Urban, Symb. Ant. 4: 291. 1905.

Stem trailing, rooting at the nodes, glabrate to somewhat pilose, 2-7 dm. long. Stipules ovate to ovate-lanceolate, short, 4-7 mm. long; petioles slender, more or less pubescent, 3-10 cm. long; leaflets 3, ovate to rhombic-elliptic, 3-7 cm. long, glabrous or nearly so above, appressed-pubescent or glabrate beneath, obtuse and rounded, or merely acutish at the apex; stipels subulate, deciduous; racemes elongated, sometimes 3 dm. long; pedicels filiform, 8-15 mm. long; bracts ovate to ovate-lanceolate, pilose, 3-4 mm. long; calyx about 2 mm. long; corolla rose to violet, about 6 mm. long; loment short-stipitate in the calyx, mostly 2-jointed, the upper suture slightly indented between the joints, the lower margin deeply intruded, the rhombic-oblong joints densely pubescent, 6-8 mm. long. [*Desmodium oblongifolium* of Krebs.]

Banks, thickets and woodlands, at lower and middle elevations, Porto Rico, ascending into the eastern mountains; St. Thomas (ex Krebs); St. Croix;—Jamaica; Cuba; Hispaniola; Saba to Trinidad; continental tropical America.

6. *Meibomia umbrosa* Britton, Bull. Torr. Club 37: 353. 1910.

? *Desmodium spirale stoloniferum* DC. Prodr. 2: 333. 1825.

Meibomia axillaris acutifolia Kuntze, Rev. Gen. Pl. 195. 1891.

Desmodium axillare angustatum Urban, Symb. Ant. 2: 303. 1900.

Desmodium axillare angustatum forma *robustius* Urban, Symb. Ant. 2: 303. 1900.

Desmodium axillare acutifolium Urban, Symb. Ant. 4: 292. 1905.

Stem trailing, rooting at the nodes, 5-10 dm. long, densely villous. Stipules lanceolate or lance-subulate, about 1 cm. long, acuminate; petioles rather stout, densely villous, 4-12 cm. long; leaflets 3, ovate to ovate-lanceolate, 5-10 cm. long, sparingly pubescent or glabrate above, rather densely pubescent beneath, acute or acuminate at the apex; stipels lance-subulate, deciduous; racemes elongated, often 3 dm. long; pedicels filiform, 2 cm. long or less; bracts ovate, pilose, about 5 mm. long; calyx 2-3 mm. long; corolla purple or reddish, about twice as long as the calyx; loment stipitate, 1-3-jointed, the upper suture continuous, undulate, the lower margin deeply intruded, the obliquely oblong-rhombic joints about 8 mm. long, densely pubescent. [*Desmodium oblongifolium* DC.]

Woods and thickets, eastern districts, ascending into the Luquillo Mountains, Porto Rico;—Jamaica; Cuba; Martinique; St. Vincent; Panama to Brazil. [*Hedysarum repens* Sessé & Mocino, not of Linnaeus.]

7. *Meibomia Sintenisii* (Urban) Britton.

Desmodium axillare Sintenisii Urban, Symb. Ant. 2: 303. 1900.

Stem trailing, rooting at the nodes, finely puberulent, 6 dm. long or longer. Stipules lanceolate, about 1 cm. long; petioles slender, puberulent, 10 cm. long or less; leaflets 3, ovate, 5-7 cm. long, glabrous above, appressed-pubescent beneath, sharply and somewhat abruptly acuminate at the apex, rounded or obtuse at the base; racemes elongated; flowers described as white; loment-joints about 10 mm. long.

Mountain forests of Porto Rico;—Hispaniola; ?Jamaica.

8. *Meibomia Wydleriana* (Urban) Britton.

Desmodium Wydlerianum Urban, Symb. Ant. 2: 302. 1900.

Stem trailing, rooting at the nodes, puberulent. Stipules lanceolate, acuminate, 4–8 mm. long; petioles slender, 3–5 cm. long, puberulent; leaflets 3, triangular-ovate or triangular-rhombic, 3–6 cm. long, membranous, slightly pubescent or glabrous on both sides, shining above, pale and dull beneath; racemes elongated, few-flowered, 10–15 cm. long; flowering pedicels 8–15 mm. long; bracts 1.5–2 mm. long, deciduous; calyx about 2 mm. long, its triangular-lanceolate teeth acuminate; corolla violet, about 4 mm. long; loment 2–3-jointed.

Eastern Porto Rico;—Grenada; Tobago.

9. *Meibomia scorpiurus* (Sw.) Kuntze, Rev. Gen. Pl. 198. 1891.

Hedysarum scorpiurus Sw. Prodr. 107. 1788.

Desmodium scorpiurus Desv. Journ. Bot. 1: 122. 1813.

Stems prostrate or procumbent, slender, angled, loosely pubescent, 2–8 dm. long. Stipules obliquely ovate, half-cordate, about 4 mm. long; leaflets 3, oblong to elliptic or ovate-elliptic, 1–4.5 cm. long, obtuse and rounded or slightly emarginate at the apex, mostly obtuse at the base, loosely appressed-pubescent with scattered hairs on both sides; stipels minute, subulate; racemes slender, 5–20 cm. long; pedicels short, 1 cm. long or less; bracts lanceolate-subulate, deciduous, about 2 mm. long; calyx about 2.5 mm. long, its teeth linear-lanceolate; corolla about 3 mm. long, pink to purple; loment linear, nearly sessile, 2–7-jointed, both margins about equally undulate, the narrowly oblong joints 2–3 times as long as wide, not twisted.

Fields, sand dunes, hillsides and cultivated grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas (ex Grisebach); Tortola;—Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America; East Indies.

10. *Meibomia mollis* (Vahl) Kuntze, Rev. Gen. Pl. 198. 1891.

Hedysarum molle Vahl, Symb. 2: 83. 1791.

Desmodium molle DC. Prodr. 2: 332. 1825.

Stem erect, rather stout, branched, 2 m. high or less, softly pubescent. Stipules triangular-subulate, 2–6 mm. long; leaflets 3, rarely only 1, ovate, 2–10 cm. long, acute or acutish at the apex, obtuse at the base, pubescent on both sides, as long as the pubescent petioles or shorter; stipels subulate; racemes 1–2 dm. long, commonly branched; pedicels filiform, 3–8 mm. long; bracts ovate, about 1 mm. long, deciduous; calyx 2.5–3 mm. long, its teeth linear-lanceolate; corolla blue, little longer than the calyx; loment nearly sessile, 2-jointed, the lower joint small, twisted, the upper one elliptic or subreniform, 6–8 mm. long, finely reticulate-veined, sparingly pubescent or glabrate.

Fields, hillsides, waste and cultivated grounds, Porto Rico; Mona; Culebra; St. Croix; St. Thomas; Tortola; Virgin Gorda;—Bahamas; recorded from Jamaica; Cuba; Hispaniola; Martinique; Curaçao; continental tropical America.

11. *Meibomia purpurea* (Mill.) Vail; Small, Fl. S. E. U. S. 639. 1903.

Hedysarum purpureum Mill. Gard. Dict. ed. 8. 1768.

Hedysarum tortuosum Sw. Prodr. 107. 1788.

Desmodium tortuosum DC. Prodr. 2: 332. 1825.

Meibomia tortuosa Kuntze, Rev. Gen. Pl. 198. 1891.

Desmodium purpurcum Fawcett & Rendle, Fl. Jam. 4: 36. 1920. Not H. & A.

Erect, branched, 1.5 m. high or less, the stem and branches finely and rather densely pubescent, striate. Stipules lanceolate, acuminate, half cordate at base, 6–15 mm. long; leaflets 3, ovate to oblong or elliptic, 2–10 cm. long, sparingly

pubescent with appressed hairs, or glabrous above, mostly obtuse at the apex and narrowed at the base, as long as the petioles or longer; stipels subulate; racemes simple or sparingly branched, 1.5–3 dm. long; pedicels filiform, 1–2 cm. long; bracts narrowly lanceolate, 2–3 times as long as the calyx, deciduous; calyx about 2 mm. long, its teeth subulate; corolla blue to purple, about 5 mm. long; loment nearly sessile, at first much twisted, at length flat, 3–6-jointed, both margins deeply undulate, the oval-orbicular joints 4–5 mm. long.

Banks, fields, waste and cultivated grounds at lower and middle elevations, Porto Rico; Culebra; St. Croix; St. Thomas; Tortola;—Florida; Texas; Jamaica; Cuba to Grenada; continental tropical America. JUNQUILLO.

12. *Meibomia procumbens* (Mill.) Britton.

Hedysarum procumbens Mill. Gard. Dict. ed. 8. 1768.

Hedysarum spirale Sw. Prodr. 107. 1788.

Desmodium spirale DC. Prodr. 2: 332. 1825.

Desmodium tenuiculum DC. Prodr. 2: 333. 1825.

Desmodium procumbens Hitchc. Rep. Mo. Bot. Gard. 4: 76. 1893.

Stems slender, ascending or diffuse, branched, 8 dm. long or less, the branches pubescent or glabrous. Stipules small, 2–4 mm. long, lanceolate-subulate, dilated at the base; leaflets 3, or on upper leaves reduced to 1, thin in texture, ovate to oblong or suborbicular, 1–5 cm. long, acute or obtuse at the apex, sparingly pubescent or glabrous; stipels minute, subulate; racemes slender, mostly branched, 5–15 cm. long; pedicels filiform, 5–10 mm. long; bracts minute, deciduous; calyx about 2 mm. long; corolla somewhat longer than the calyx, purplish to white or blue; loment nearly sessile, 2–8-jointed, both margins constricted nearly to the middle, the nearly quadrate joints permanently twisted, about 4 mm. long.

Fields, hillsides and waste grounds at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan;—Jamaica; Cuba to Trinidad; Margarita; Curaçao; continental tropical America and Old World tropics.

23. *SAGOTIA* Duch. & Walp. *Linnaea* 23: 737. 1850.

Low perennial herbs, diffuse or prostrate, with small, 3-foliolate leaves, the leaflets estipellate, or minutely stipellate, the flowers 1–4 together in axillary clusters, or opposite the leaves, on filiform pedicels. Calyx-tube campanulate, short, the calyx-teeth narrow, the 2 upper ones somewhat united. Corolla blue, purple or white, the standard broad, the wings oblique, the keel blunt. Pod a few-jointed loment. [Commemorates P. Sagot, French physician and botanist.] Three known species, natives of the Old World tropics, the following typical one perhaps native also in tropical America, where it is widely distributed.

1. *Sagotia triflora* (L.) Duch. & Walp. *Linnaea* 23: 738. 1850.

Hedysarum triflorum L. Sp. Pl. 749. 1753.

Desmodium triflorum DC. Prodr. 2: 334. 1825.

Meibomia triflora Kuntze, Rev. Gen. Pl. 197. 1891.

Diffusely branched, often matted and tufted; stems slender, loosely pilose or glabrate, 3 dm. long or less. Stipules lanceolate or ovate-lanceolate, 2.5 mm. long, acuminate; petioles slender, 4–10 mm. long; leaflets glabrous or nearly so, obovate, subtruncate or emarginate, 6–11 mm. long; pedicels shorter than the leaves; calyx 4–5 mm. long, deeply toothed; corolla purplish to white, little longer than the calyx; loment curved, 2 cm. long or less, the upper suture continuous, the lower margin crenate, the 4–6 reticulated joints pilose or glabrate.

Fields, banks and roadsides at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; St. Jan; Virgin Gorda;—Florida; Jamaica; Cuba to Trinidad; New and Old World tropics.

24. **ALYSICARPUS** Neck.; DC. Prodr. 2: 352. 1825.

Herbs, our species with 1-foliolate leaves and small purplish or blue flowers in short terminal racemes, the scarious bracts deciduous. Calyx narrow, deeply cleft, the lobes lanceolate-acuminate, chartaceous, striate, the two upper ones partly united. Standard suborbicular, clawed; wings obliquely oblong, adnate to the blunt incurved keel. Stamens diadelphous (9 and 1). Ovary nearly sessile, several-ovuled; style filiform, its apex incurved; stigma terminal, capitate. Loment nearly terete, several-jointed, the joints indehiscent. [Greek, chain-fruit.] About 16 species, natives of the Old World tropics. Type species: *Alysicarpus bupleurifolius* (L.) DC.

1. **Alysicarpus vaginalis** (L.) DC. Prodr. 2: 353. 1825.

Hedysarum vaginale L. Sp. Pl. 746. 1753.

Perennial, branched at the base, the branches slender, diffuse, glabrous or nearly so, spreading or ascending, 5 cm.–6 dm. long. Stipules scarious, striate, lanceolate, acuminate, 4–6 mm. long; petioles very slender, 1 cm. long or less; leaflets glabrous, or sparingly pubescent, the lower orbicular to oval, 5–12 mm. long, the upper oblong to lanceolate, 1–3.5 cm. long; racemes 1–3 cm. long; pedicels very short, pubescent; calyx 4–5 mm. long; corolla little longer than the calyx; loment 1–2 cm. long, its puberulent or glabrous joints truncate, slightly wrinkled. [*A. nummulariaefolius* of authors, not *Hedysarum nummulariaefolium* L.]

Fields, waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—nearly throughout the West Indies, except the Bahamas. YERBA DE CONTRABANDO. FALSE MONEY-WORT.

25. **SECURIDACA** L. Sp. Pl. 707. 1753.

Woody vines, or widely branching shrubs, or trees with alternate, unevenly pinnate leaves, the leaflets estipellate, and small white, bracted flowers mostly in axillary clusters. Calyx subcampanulate, its teeth nearly equal. Standard broadly ovate or suborbicular; wings oblong; keel blunt, incurved, its petals connate on the back near the apex. Stamens 9, in two fascicles of 4 and 5; anthers erect, their sacs dehiscent by terminal slits. Ovary 2-ovuled, stipitate; style nearly straight; stigma terminal. Pod nearly orbicular to short-elliptic, nearly flat, 1-seeded, subligneous, indehiscent. [Latin, like a hatchet.] About 5 species, or more, natives of tropical America and Africa. Type species: *Securidaca volubilis* L.

1. **Securidaca volubilis** L. Sp. Pl. 707. 1753.

Dalbergia monetaria L.f. Suppl. 317. 1781.

Ecastophyllum monetaria DC. Prodr. 2: 421. 1825.

Usually a vine, climbing to a height of 3–6 m., sometimes shrubby, rarely tree-like and 5 m. high, the young twigs and petiolules finely pubescent or glabrous. Stipules ovate; leaves 2–5-foliolate; petioles 1–2 cm. long; leaflets ovate or ovate-elliptic, 6–13 cm. long, glabrous on both sides or very sparingly pubescent beneath, acuminate at the apex, rounded or obtuse at the base; panicles axillary, pubescent, 3 cm. long or less; pedicels very short; calyx pubescent, about 5 mm. long; corolla about 3 times as long as the calyx; pod oval-orbicular, 2.5–4 cm. long, glabrous, shining. [*Ecastophyllum Berterii* of Bello, not of de Candolle.]

Banks, hillsides and along streams at lower and middle elevations, Porto Rico, in moist or wet districts:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America. MEMBRILLO. PALO DE BRASILETE. MONEY-BUSH.

26. **ECASTOPHYLLUM** [P. Br.] Adans. Fam. Pl. 2: 320. 1763.

Woody vines or shrubs, the alternate leaves 1-foliolate, the white flowers in small axillary panicles. Calyx short, its 2 upper teeth broad. Standard suborbicular; wings oblong; keel blunt, incurved, its petals united on the back. Stamens 10, united into a cleft sheath, or the upper one partly free; anther-sacs opening by terminal slits. Ovary 2-ovuled; style slender. Pod suborbicular, flat, 1-seeded, subcoriaceous, indehiscent. [Greek, referring to the 1-foliolate leaves.] A few species of tropical and subtropical America, the following typical.

1. **Ecastophyllum Ecastophyllum** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 55. 1918.

Hedysarum Ecastophyllum L. Syst. ed. 10, 1169. 1759.

Pterocarpus Ecastophyllum L. Syst. ed. 13, 533. 1774.

Ecastophyllum Brownei Pers. Syn. 2: 277. 1807.

Dalbergia Ecastophyllum Taubert, in E. & P. Nat. Pfl. 3^{3a}: 335. 1894.

A widely branched, spreading or shrub-like vine 2-10 m. long, rarely tree-like and described as sometimes reaching a height of 8 m., the branches elongated, the young twigs finely pubescent. Stipules lanceolate, silky-pubescent, acuminate, about 1 cm. long; leaves 1-foliolate; petioles stout, pubescent, 5-12 mm. long; petiolule 2-3 mm. long; leaflet ovate, 6-12 cm. long, rounded or subcordate at the base, short-acuminate at the apex, glabrous or nearly so above, finely and densely pubescent beneath, at least when young; panicles axillary, pubescent, usually little longer than the petioles; pedicels 2-4 mm. long; flowers slightly fragrant; calyx pubescent, about 5 mm. long; corolla about 1 cm. long; pod suborbicular to broadly oval, 1.5-3 cm. long, finely pubescent. [*Amerimum Brownei* of Krebs.]

Coastal thickets and borders of mangrove swamps, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; Bahamas; Jamaica; Cuba; Trinidad; continental tropical America; tropical Africa. MARAY-MARAY. PALO DE POLLO.

Ecastophyllum glabrum Desv., attributed to Porto Rico erroneously, was probably from Guiana (according to Urban).

27. **DREPANOCARPUS** G. F. W. Meyer, Prim. Fl. Ess. 236. 1818.

Woody vines, or trees, with unevenly pinnate leaves, the estipellate leaflets mostly alternate, the stipules spinescent in our species, and small paniced or racemose purple to white, minutely bracted flowers. Calyx truncate, minutely 5-toothed, obtuse at the base. Standard orbicular or broadly ovate, silky-pubescent without; wings oblong; keel incurved, its petals connate on the back. Stamens monadelphous or diadelphous, their sheath variously cleft; anthers longitudinally dehiscent. Ovary short-stipitate; ovules 1 or 2; style filiform, incurved; stigma terminal. Pod coriaceous, curved into a circle, or broadly falcate, 1-seeded. Seed flat, reniform. [Greek, sickle-fruit.] About 8 species, natives of tropical America and Africa, the following typical.

1. **Drepanocarpus lunatus** (L.f.) G. F. W. Meyer, Prim. Fl. Ess. 238. 1818.

Pterocarpus lunatus L.f. Suppl. 317. 1781.

Shrubby, with spreading branches, or climbing to a height of 4 m. or more, the young twigs finely pubescent. Stipular spines curved, 4-10 mm. long; petioles slender, 1-2 cm. long; leaflets 5-11, short-stalked, oblong, or the terminal

one obovate or oblanceolate, 2-5 cm. long, rounded at the apex, somewhat narrowed at the base, glabrous on both sides, chartaceous; panicles terminal and axillary, many-flowered, 6-15 cm. long; pedicels about 2 mm. long; calyx about 5 mm. long, obtuse at the base; corolla purple to lilac, 7-9 mm. long; pod coriaceous, flat, curved into a circle which is 2-4 cm. broad.

Coastal thickets and woods, Porto Rico; Vieques; St. Croix; St. Thomas;—Hispaniola; Guadeloupe to Trinidad; continental tropical America; tropical Africa. ESCAMBRON. PALO DE BOZ.

28. **PTEROCARPUS** L.; Jacq. Sel. Amer. 283. 1763.

Unarmed trees, with alternate, unevenly pinnate leaves, the leaflets mostly alternate, estipellate, the flowers in terminal or axillary panicles or racemes, their bracts caducous. Calyx campanulate, 5-toothed, the 2 upper teeth more or less united, its base acute or turbinate. Standard orbicular or broadly ovate, glabrous; wings obliquely obovate or oblong; keel-petals similar to the wings, distinct or united on the back. Stamens monadelphous or diadelphous; anthers longitudinally dehiscent, versatile. Ovary 2-6-ovuled; style very slender; stigma small and terminal. Pod flat, or compressed, indehiscent, obliquely orbicular to oval, chartaceous, winged or acutely margined, 1-2-seeded. [Greek, winged-fruit.] About 20 species, natives of tropical regions, the following typical.

1. **Pterocarpus officinalis** Jacq. Sel. Amer. 283. 1763.

Pterocarpus Draco L. Sp. Pl. ed 2, 1662. 1763.

A large tree, sometimes 30 m. high, glabrous, except the minutely pubescent inflorescence. Leaves 2-4 dm. long; leaflets 5-9, alternate, ovate to ovate-oblong or ovate-lanceolate, short-stalked, shining, 5-12 cm. long, acuminate at the apex, rounded or obtuse at the base; flowers numerous, in loose panicles about as long as the leaves; pedicels 2-4 mm. long; calyx glabrous, oblique, about 5 mm. long, its teeth short and broad; corolla 10-15 mm. long, yellow, or the standard violet; pod short-stipitate, glabrous, very obliquely suborbicular, 3-5 cm. broad, broadly winged along one side, reticulate-veined, 1-seeded.

Forests at lower and middle elevations, Porto Rico, occasional only;—Guadeloupe; Dominica; St. Lucia; St. Vincent; Trinidad and continental tropical America; Jamaica (?). The light brown wood is weak and not durable; it has a specific gravity of about 0.6. PALO DE POLLO.

29. **LONCHOCARPUS** H. B. K. Nov. Gen. 6: 383. 1824.

Trees or vinelike shrubs, with alternate, unevenly pinnate leaves, the leaflets opposite, short-stalked, the rather large, purple to white flowers racemose or paniculate. Calyx cup-like, truncate or 5-toothed. Standard nearly orbicular, or obovate; wings oblong or falcate; keel blunt, its petals slightly cohering on the back. Stamens mostly monadelphous, with versatile anthers. Ovary 2-many-ovuled, mostly short-stipitate; style filiform, incurved; stigma small and terminal. Pod oblong to linear, flat, coriaceous or membranous, indehiscent, not winged. [Greek, lance-fruit.] About 50 species, natives of tropical regions. Type species: *Lonchocarpus punctatus* H. B. K.

Pod coriaceous; calyx truncate, very minutely toothed.

Pod mostly deeply constricted between the seeds; leaflets not finely reticulate-veined, acuminate; twigs tomentulose.

Pod linear, scarcely or not at all constricted; leaflets finely reticulate-veined beneath, glaucescent, blunt, emarginate; twigs glabrous.

Pod papery; calyx 5-toothed; leaves pubescent beneath.

1. *L. domingensis*.

2. *L. glaucifolius*.

3. *L. latifolius*.

1. **Lonchocarpus domingensis** (Pers.) DC. Prodr. 2: 259. 1825.

Dalbergia domingensis Pers. Syn. 2: 276. 1807.

? *Robinia latifolia* Spreng. Syst. 3: 247. 1826. Not Poir.

Cytisus major Sessé & Moc. Fl. Mex. ed. 2, 174. 1894.

A tree, up to 15 m. high, with widely spreading branches, the twigs finely brown-tomentulose. Leaves 1.5–2 dm. long; leaflets 7–11, oval to elliptic-oval, 5–12 cm. long, firm in texture, acute or short-acuminate at the apex, mostly obtuse at base, glabrous above, sparingly pubescent beneath; panicles axillary, often as long as the leaves, nearly simple or slightly compound; pedicels often 2 on common peduncle, 3–6 mm. long; calyx 4–6 mm. long, nearly truncate, finely tomentulose, in fruit broader than long; corolla violet to rose, 2–3 times as long as the calyx; standard silky-pubescent; pod 10 cm. long or less, brown-tomentulose or becoming glabrous, usually constricted between the seeds, 1.5–2 cm. wide, flat, coriaceous.

River banks and hillsides, western and southern districts of Porto Rico.—Cuba; Hispaniola; Guadeloupe; Martinique. Recorded from Jamaica. GENO-GENO.

2. **Lonchocarpus glaucifolius** Urban, Symb. Ant. 1: 326. 1899.

Vine-like, with slender branches, or forming a tree up to 8 m. high, the twigs and leaves glabrous. Stipules triangular, scarcely 1 mm. long, deciduous. Leaves 1–1.5 dm. long; leaflets 5–7, elliptic to obovate-oblong, 4–13 cm. long, obtuse and emarginate at the apex, obtuse or somewhat narrowed at the base, firm in texture, pale, glaucescent, densely and finely reticulate-veined beneath; panicles 6–14-flowered, much shorter than the leaves; pedicels 5–8 mm. long, often 2 on a common peduncle; calyx about 4 mm. long, minutely pilose, truncate; corolla rose, about 3 times as long as the calyx; standard finely silky; pod linear, 14 cm. long or less, 1–1.5 cm. wide, flat, scarcely or not constricted, subcoriaceous. [*L. violaceus* Stahl and of Cook and Collins, not of H. B. K.]

Mountain woodlands and hillsides, western districts of Porto Rico. Endemic. GENO.

3. **Lonchocarpus latifolius** (Willd.) H. B. K. Nov. Gen. 6: 383. 1823.

Amerimum latifolium Willd. Sp. Pl. 3: 909. 1803.

Dalbergia pentaphylla Poir. in Lam. Encycl. Suppl. 2: 445. 1811.

Lonchocarpus pentaphyllus H. B. K. Nov. Gen. 6: 383. 1823.

Cytisus membranaceus Sessé & Moc. Fl. Mex. ed. 2, 174. 1894.

A tree up, to 20 m. high, the young twigs tomentulose or glabrous. Stipules ovate, 1–2 mm. long, early deciduous; leaves 3 dm. long or less; leaflets 5–9, elliptic to oblong-lanceolate, 5–15 cm. long, acute, obtuse or acuminate at the apex, narrowed or rounded at the base, glabrous above, densely finely pubescent beneath; racemes several-many-flowered, shorter than the leaves; pedicels mostly solitary, 1.5–5 mm. long; calyx puberulent, 2–3 mm. long, 5-toothed, becoming truncate and broader than long; corolla purple, about 3 times as long as the calyx; the standard silky; pod oblong, narrowed at both ends, 10 cm. long or less, 2–2.5 cm. wide, papery, finely pubescent or becoming glabrous.

Woodlands, in moist or wet districts, Porto Rico.—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America. Its reddish wood is used for furniture. PALO HEDIONDO. FORTE VENTURA.

30. **ICHTHYOMETHIA** P. Br. Hist. Jam. 296. 1756.

Trees, with unevenly pinnate leaves, the short-stalked leaflets large, opposite, estipellate, the pink to purplish, rather large flowers in lateral panicles, often appearing before the leaves. Calyx obliquely campanulate, 5-toothed, the 2 upper teeth connate. Standard suborbicular; wings oblong, somewhat falcate,

adherent to the keel; keel obtuse, its petals coherent on the back. Stamens monadelphous, but the upper one free at the base; anthers versatile. Ovary many-ovuled; style filiform, incurved; stigma terminal, small. Pod linear, flattened, indehiscent with 4, broad, membranous wings, several-many-seeded. [Greek, fish-killing.] A few species of tropical and subtropical America, the following typical.

1. **Ichthyomethia piscipula** (L.) Hitchc. Gard. & For. **4**: 472. 1891.

Erythrina piscipula L. Sp. Pl. 707. 1753.

Piscidia Erythrina L. Syst. ed. 10, 1155. 1759.

Piscidia carthaginensis Jacq. Enum. 27. 1760.

Piscidia piscipula Sargent, Gard. & For. **4**: 436. 1891.

Ichthyomethia acuminata Blake, Journ. Wash. Acad. **9**: 249. 1919.

A tree, usually low, rarely 20 m. high, the twigs finely puberulent, the trunk up to 6 dm. thick. Leaves 2-3 dm. long; leaflets 5-9 (rarely 3), elliptic, oblong, or the lower pair ovate, 4-12 cm. long, obtuse or acutish at the apex, rounded at the base, glabrous above, at least when mature, finely pubescent beneath; panicles many-flowered, as long as the leaves or shorter; ultimate pedicels short, puberulent; calyx about 6 mm. long, its teeth triangular-ovate; corolla silky, about 1.5 cm. long; pod 5-15 cm. long, its wings 7-12 mm. wide, lacerate, transversely veined; seeds black.

Coastal thickets and hillsides near Fajardo, and along the southern coast of Porto Rico, extending north to Punta Guaniquilla; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; West Indies. The branches, thrown into water, stupify fish. The yellowish hard and durable wood has a specific gravity of about 0.9. FISH POISON. VENTURA. DOGWOOD.

31. **ANDIRA** Lam. Encycl. **1**: 171. 1783.

Trees, with alternate, unevenly pinnate leaves, the leaflets opposite or rarely alternate, stipellate or estipellate, the rather small pink, purple or violet flowers in large, mostly terminal panicles. Calyx subcampanulate, truncate or minutely 5-toothed. Standard nearly orbicular; wings oblong, obtuse; keel-petals similar to the wings. Stamens diadelphous, rarely monadelphous; anthers versatile. Ovary usually stipitate; style short and incurved; stigma small and terminal. Fruit globose to obovoid, fleshy, indehiscent, with a single pendulous seed. [Brazilian name.] About 15 species, natives of tropical America, the following one recorded also from western tropical Africa. Type species: *Andira racemosa* Lam.

1. **Andira inermis** H. B. K. Nov. Gen. **6**: 385. 1823.

Goeffraea jamaicensis inermis W. Wright, Trans. Roy. Soc. **67**: 512. 1777.

Andira jamaicensis Urban, Symb. Ant. **4**: 298. 1905.

A tree, up to 20 m. high, the young twigs and inflorescence pubescent, the malodorous bark gray, narrowly fissured. Leaves 2-4 dm. long; leaflets 7-13, opposite, short-stalked, oblong to oblong-lanceolate or obovate-oblong, acute or short-acuminate at the apex, mostly obtuse at the base, 5-8 cm. long, glabrous on both sides, finely reticulate-veined beneath, the subulate, deciduous stipels 3-5 mm. long; panicles often as long as the leaves, many-flowered, the flowers subsessile; calyx pubescent, 4-5 mm. long; corolla pink to purple, 1-1.5 cm. long, glabrous; pod stalked, green, subglobose, 2-4 cm. in diameter, the exocarp fleshy, the endocarp woody. [* *A. racemosa* of Grosourdy.]

Woodlands, hillsides and river banks, Porto Rico, ascending to high elevations; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Jamaica; Cuba; Hispaniola; St. Kitts

to Trinidad; continental tropical America. MOCA. BASTARD MAHOGANY. ANGELIN TREE. CABBAGE BARK. The wood used in carpentry and construction, for canes and handles, for piles and for boats, is reddish yellow, hard, strong and durable, with specific gravity of about 0.8.

32. **CICER** [Tourn.] L. Sp. Pl. 738. 1753.

Erect or ascending, often glandular-pubescent herbs, with alternate, pinnate leaves, the estipellate leaflets dentate, the stipules foliaceous, the white, blue or purple flowers solitary or few together in the axils on slender peduncles. Calyx oblique, or gibbous at base, deeply 5-cleft. Standard suborbicular, clawed; wings obliquely obovate; keel broad, incurved. Stamens diadelphous (9 and 1); anthers all alike. Ovary sessile, 2-several-ovuled; style filiform, glabrous, incurved; stigma terminal. Pod ovoid to oblong, swollen, 2-valved. Seeds subglobose. [Name Hebraic.] About 7 species, natives of southern Europe, northern Africa and western Asia, the following typical.

1. **Cicer arietinum** L. Sp. Pl. 738. 1753.

Annual, glandular-pubescent, erect or ascending, branched, 3-6 dm. high, the branches angled. Leaves 5-10 cm. long; stipules 3-5 mm. long, dentate, acute; petioles slender, 1-3 cm. long; leaflets 9-17, oblong or obovate, sessile, 8-16 mm. long, serrate above, entire below, mostly obtuse; flowers white to purple, nodding, solitary on peduncles much shorter than the leaves; calyx-lobes linear-lanceolate, acute, 6-8 mm. long; corolla somewhat longer than the calyx; pod oblong, erect, 2-3 cm. long, densely pubescent.

Waste grounds, San Juan, 1914.—Cuba; Bolivia; occasional as a waif in eastern North America. Native, perhaps, of the Mediterranean region. Occasionally cultivated in Porto Rico. GARBANZOS. CHICK-PEA.

33. **ABRUS** L. Syst. ed. 12, 2: 472. 1767.

Slender, somewhat woody vines, with evenly pinnate leaves, the numerous, estipellate leaflets entire, the rachis terminating in a small bristle, the small rose to white flowers clustered at the nodes of axillary or terminal racemes. Calyx subtruncate, its teeth very short. Standard ovate, with a broad and short claw; wings oblong, falcate; keel curved, larger than the wings. Stamens 9, monadelphous. Ovary nearly sessile, several-many-ovuled; style short-curved; stigma terminal. Pod flat, 2-valved, partitioned between the subglobose, shining seeds. [Greek, graceful.] Five known species, of tropical regions, the following typical.

1. **Abrus Abrus** (L.) W. F. Wight. Contr. U. S. Nat. Herb. 9: 171. 1905.

Glycine Abrus L. Sp. Pl. 753. 1753.

Abrus praecatorius L. Syst. ed. 12, 472. 1767.

Stems woody below, nearly herbaceous above, climbing or twining to a length of 2-3 m., glabrous, or the young parts sparingly pubescent. Stipules linear, acute, 3-5 mm. long; petioles short, mostly less than 1 cm. long; leaves 5-10 cm. long, the very slender rachis sparingly pubescent; leaflets 8-15 pairs, 8-20 mm. long, oblong, or the upper ones obovate, glabrous above, sparingly puberulent beneath, rounded and mucronulate at the apex, rounded at the base, very short-stalked, readily detached when dry; racemes peduncled, 3-8 cm. long; corolla red to purple, rarely white, 8-10 mm. long; pod oblong, beaked, 2-3.5 cm. long, about 1 cm. wide; seeds scarlet with a black base.

Waste grounds and thickets at lower and middle elevations. Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—West Indies; continental tropical America and Old World tropics. PERONILLAS. CRABS'-EYES. JUMBEE BEAD. WILD LICORICE.

34. **CLITORIA** L. Sp. Pl. 753. 1753.

Woody vines, or erect or climbing herbs, with pinnately 5–9-foliolate leaves, persistent stipules, and large axillary flowers. Calyx tubular, 5-toothed, the 2 upper teeth more or less united; standard large, erect, retuse, narrowed at the base, not spurred; wings oblong, curved; keel acute, shorter than the wings; stamens more or less monadelphous; anthers all alike; ovary stipitate; style elongated, incurved, hairy along the inner side; pod short-stalked in the calyx; linear or linear-oblong, flattened, 2-valved, the valves ecostate. [Name Greek.] Six or eight species, natives of the Old World tropics, the following typical.

1. **Clitoria ternatea** L. Sp. Pl. 753. 1753.

Perennial, herbaceous or slightly woody below, slender, twining to a height of 5 m. or more, or, if without support, prostrate, pubescent, at least on the younger parts. Stipules linear-lanceolate, acuminate, 5–8 mm. long; petiole slender, pubescent, 1–3 cm. long; leaflets 5–9 (usually 5), ovate or oval, short-stalked, 2–3.5 cm. long, mostly obtuse at the apex, obtuse or narrowed at the base, thin, glabrous above, somewhat pubescent beneath; peduncles 1-flowered, 1–2 cm. long; bracts ovate-orbicular, obtuse, 5–7 mm. long; calyx about 1.7 cm. long, its lanceolate lobes acuminate; corolla large, blue and white, the standard 3–4 cm. long; pod nearly sessile, flat, linear, beaked, pubescent, 13 cm. long or less, about 1 cm. wide; seeds compressed, subreniform, mottled, 5–6 mm. long.

Banks, thickets and waste grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; widely distributed in the West Indies and tropical continental America through cultivation for ornament. Native of the Old World tropics. BEJUCO DE COXCHITAS. PAPITO.

35. **MARTIUSIA** Schultes, Mant. 1: 69. 1822.

Vines, or rarely suberect herbs, with 3-foliolate (rarely 1-foliolate) leaves, and large purple to white, axillary, bracteate and bracteolate flowers, few or solitary on the peduncles. Calyx tubular, 5-cleft, its 2 upper lobes connate. Standard large, nearly erect, mostly emarginate, unappendaged; wings oblong, curved, adnate to the shorter, acute curved keel. Stamens monadelphous or diadelphous (9 and 1), the anthers all alike. Ovary stipitate, several-ovuled; style long, bearded longitudinally on the inner side. Pod stipitate, 2-valved, its convex valves with a central midrib. Seeds subglobose, viscid-glandular. [Commemorates K. F. P. von Martius, 1794–1868, German botanist.] A few species, natives of tropical America, those in Porto Rico called COXCHITA and FLOR DE PITO. Type species: *Martia physodes* Leander.

Prostrate or twining vine; peduncles 3–13 cm. long; petioles long; pubescence pilose.

Erect, or with erect branches; peduncles 0.5–3 cm. long; petioles short; pubescence appressed.

1. *M. rubiginosa*.

2. *M. laurifolia*.

1. **Martusia rubiginosa** (Juss.) Britton.

Clitoria rubiginosa Juss.; Pers. Syn. 2: 303. 1807.

Neurocarpum ellipticum Desv. Journ. Bot. 1: 119. 1813.

Clitoria glycinoides DC. Prodr., 2: 234. 1825.

Neurocarpum falcatum DC. Prodr. 2: 236. 1825.

Stems slender, 6–15 dm. long, densely pilose, trailing or twining. Stipules ovate, parallel-veined, acute, 4–7 mm. long; petioles pilose, 1–4 cm. long; leaflets

ovate-oblong to oblong-lanceolate, 3–10 cm. long, thin, obtuse or acute at the apex, obtuse or rounded at the base, glabrous above, loosely villous or pubescent beneath; stipels linear, 5–7 mm. long; peduncles villous, 1–3-flowered, 3–13 cm. long; bracts and bractlets ovate, acute; flowers fragrant; calyx villous, 2–3.5 cm. long, its lobes lanceolate, acuminate, about one-half as long as the tube; corolla about 5 cm. long, white with purple or crimson veins; pod stipitate, linear-oblong, 3–4.5 cm. long, about 8 mm. thick, glabrous, its convex valves with a prominent midrib; seeds globose, very viscid, about 3 mm. in diameter.

Banks, thickets and open woods at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; St. Vincent; Tobago; Panama and tropical South America.

2. *Martusia laurifolia* (Poir.) Britton.

Clitoria laurifolia Poir. in Lam. Encycl. Suppl. **2**: 301. 1811.

Neurocarpum cajanifolium Presl, Symb. **1**: 17. 1832.

Clitoria cajanifolia Benth. Journ. Linn. Soc. **2**: 46. 1858.

Centrosema laurifolia Stahl, Est. **3**: 64. 1885.

Roots deep, woody; stems usually several, erect, appressed-pubescent above, usually simple, 2–6 dm. high, or the stem sometimes prostrate with erect branches. Stipules triangular-lanceolate, acuminate, 4–6 mm. long; petioles short, mostly less than 6 mm. long; leaflets oblong or linear-oblong, rather thin, 3–10 cm. long, rounded, emarginate, or sometimes acute at the apex, obtuse or acutish at the base, glabrous above, sparingly short-pubescent and pale beneath; stipels minute, deciduous; peduncles 0.5–3 cm. long, 1–2-flowered; bractlets ovate; calyx little pubescent or glabrous, 2–2.8 cm. long, its lobes ovate or ovate-lanceolate, about one-third as long as the tube; corolla purple, purplish or nearly white, 5–6 cm. long; pod stipitate, linear-oblong, 2.5–4 cm. long, about 8 mm. thick, glabrous, its convex valves ridged; seeds ovoid-globose, viscid, about 3 mm. long. [*Clitoria arborescens* of Stahl, not of Aiton; *Bradburya laurifolia* of Cook and Collins.]

Sandy soil on the northern coastal plain of Porto Rico, from Santurce to Manati:—Cuba; Hispaniola; Trinidad; tropical South America.

36. **BRADBURYA** Raf. Fl. Ludov. 104. 1817.

Slender vines, with pinnately 3-foliolate leaves (rarely 5–7-foliolate), persistent stipules, and large axillary bracteolate flowers. Calyx campanulate, its teeth or lobes nearly equal; standard orbicular, nearly flat, spurred on the back near its base, clawed; wings obovate, curved; keel curved. Stamens more or less diadelphous (9 and 1); style incurved, bearded at the apex around the stigma; pod linear, flattened, nearly sessile, partially septate between the seeds, 2-valved, the valves thick-edged, longitudinally finely nerved along their margins. [In honor of John Bradbury, who travelled in America early in the last century.] About 30 species, natives of America, in Porto Rico called *CONCHITA*. Type species: *Bradburya scandens* Raf.

Foliage blackening in drying; margins of the pod broad; bractlets about twice as long as the calyx.

Foliage not blackening in drying; margins of the pod narrow; bractlets as long as the calyx or shorter.

Pod 5–7 mm. wide.

Pod 4 mm. wide or less.

1. *B. Plumieri*.

2. *B. pubescens*.

3. *B. virginiana*.

1. *Bradburya Plumieri* (Turp.) Kuntze, Rev. Gen. Pl. 104. 1891.

Clitoria Plumieri Turp.; Pers. Syn. **2**: 303. 1807.

Centrosema Plumieri Benth. Ann. Wien. Mus. **2**: 118. 1838.

Stem glabrous, or loosely pubescent above, trailing or twining, 1–2 m. long, somewhat woody below. Stipules ovate, acute, striate, 4–7 mm. long; leaflets

3, ovate, or rhombic-ovate, 5–12 cm. long, blackening in drying, short-acuminate at the apex, obtuse or rounded at the base, glabrous, the petiolules sometimes pubescent; peduncles 2–6-flowered, mostly shorter than the petioles; bractlets ovate-oblong, obtuse, finely many-striate, about twice as long as the calyx; calyx 6–7 mm. long, its teeth much shorter than the tube; standard white with a purple centre, 4–5 cm. broad; pod 10–15 cm. long, about 1 cm. wide, the margins of its valves much thickened.

Recorded as found by Stahl in thickets near Bayamon, Porto Rico; St. Thomas:—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.

2. **Bradburya pubescens** (Benth.) Kuntze, Rev. Gen. Pl. 164. 1891.

Centrosema pubescens Benth. Ann. Wien. Mus. 2: 119. 1838.

Pubescent or glabrate, trailing or twining, 2 m. long or less. Stipules ovate, acute, 2–3 mm. long. Leaflets 3, ovate to oblong, stipellate, acute or blunt at the apex, rounded at the base, 4–7.5 cm. long, reticulate-veined, glabrous above, pubescent, at least on the veins, beneath; peduncles commonly longer than the petioles, few-flowered; bractlets ovate, about as long as the calyx; upper calyx-segments about as long as the calyx-tube; standard 2–4 cm. broad, white or yellowish; pod 10–20 cm. long, 5–7 cm. wide.

Banks, thickets and sand hills at lower and middle elevations, Porto Rico; Vieques:—Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America.

3. **Bradburya virginiana** (L.) Kuntze, Rev. Gen. Pl. 164. 1891.

Clitoria virginiana L. Sp. Pl. 753. 1753.

Centrosema virginianum Benth. Ann. Wien. Mus. 2: 120. 1838.

Clitoria virginiana angustifolia DC. Prodr. 2: 234. 1825.

Centrosema virginiana angustifolia Griseb. Fl. Br. W. I. 193. 1860.

Perennial, finely rough-pubescent, 6–12 dm. long. Stipules linear, acute; leaflets 3, ovate, oblong-lanceolate or linear-lanceolate, stipellate, rounded at the base, reticulate-veined, 2.5–5 cm. long; peduncles about equalling the petioles, 1–4-flowered; bractlets ovate, acute, finely striate; flowers 2.5–4 cm. long; corolla purple to violet or nearly white; calyx-lobes linear; pod 10–13 cm. long, 4 mm. wide or less, long-acuminate.

Banks, hillsides and thickets at lower and middle elevations, Porto Rico; Mona; Icaos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—southeastern United States; West Indies; tropical continental America and tropical Africa. Consists of many races, differing in width of leaflets and color of the corolla.

A curious teratological modification of the flowers of this plant, found by Mrs. Britton in a sandy thicket near Laguna Tortuguero, Porto Rico in 1924, has the calyx developed into 5 foliaceous lanceolate organs, the standard a green suborbicular ciliate disk and the ovary elongated.

37. **TERAMNUS** [P. Br.] Sw. Prodr. 105. 1788.

Slender, twining or trailing herbaceous vines, with stipellate, 3-foliolate leaves, and small bracted flowers in axillary clusters. Calyx campanulate, its 2 upper teeth sometimes connate. Standard obovate, unappendaged; wings narrow, longer than the blunt keel. Stamens monadelphous; alternate anthers small, sterile. Ovary several-ovuled, sessile; style short, glabrous, the stigma capitate. Pod narrowly linear, 2-valved, septate between the seeds, beaked by the bent style. [Derivation not explained.] About 4 species, natives of tropical regions. Type species: *Teramnus volubilis* Sw.

Leaflets oblong to lanceolate; pod densely pubescent.
Leaflets ovate to elliptic; pod sparingly and loosely pubescent.

1. *T. uncinatus*.
2. *T. labialis*.

1. **Teramnus uncinatus** (L.) Sw. Prodr. 105. 1788.

Dolichos uncinatus L. Sp. Pl. ed. 2, 1019. 1763.

A slender vine, 6 dm. long or longer, the stems, petioles and inflorescence densely villous-pubescent. Stipules lanceolate, 3–5 mm. long; petioles 3–6 cm. long; leaflets oblong to oblong-lanceolate, 5–8 cm. long, acute, apiculate or blunt at the apex, obtuse or rounded at the base, appressed-pubescent above, silky-pubescent beneath; racemes slender, mostly longer than the leaves, distantly several-flowered, or some flowers solitary in the axils; calyx villous, 5–6 mm. long, its 5 narrow lobes nearly equal, longer than the tube; corolla purplish to white, little longer than the calyx; pods 4–7 cm. long, 3–4 mm. wide, densely brown-pubescent, the abruptly bent beak 3–5 mm. long; seeds oblong, brownish, shining, 3 mm. long.

Banks, hillsides and thickets at lower and middle elevations, Porto Rico:—Jamaica; Cuba; Hispaniola; continental tropical America. CRESTA DE GALLO BLANCO.

2. **Teramnus labialis** (L.f.) Spreng. Syst. 3: 235. 1826.

Glycine labialis L.f. Suppl. 325. 1781.

A slender vine, sometimes 1.5 m. long, the stems, petioles and inflorescence loosely short-villous. Stipules lanceolate or ovate-lanceolate, about 3 mm. long; leaflets ovate to elliptic or oval, thin, 2–5 cm. long, bearing scattered, appressed hairs on the upper surface, appressed-pubescent beneath, acutish or obtuse at the apex, rounded at the base; inflorescence few-several-flowered, as long as the leaves or longer; calyx about 4 mm. long, hirsute, its 5 linear lobes nearly equal, not longer than the tube; corolla somewhat longer than the calyx; pod 3–5 cm. long, about 3 mm. wide, loosely pubescent or glabrate, its beak about 2 mm. long; seeds oblong-quadrate, dark brown, 1.5–2.5 mm. long.

Banks and hillsides near the southern and eastern coasts of Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Jamaica; St. Kitts to Barbados; Old World tropics.

38. **CAJAN** Adans. Fam. Pl. 2: 326. 1763.

A perennial stiff, slightly woody herb, finely puberulent or pubescent, with pinnately 3-foliolate leaves, and showy yellow flowers in stalked axillary racemes. Calyx narrowly campanulate, its lobes acute, the 2 upper ones partly united. Standard nearly orbicular, reflexed; wings obliquely obovate; keel with a blunt incurved tip. Ovary many-ovuled; style thickened above; stigma oblique. Pod linear, flattened, acute and long-tipped, its valves impressed between the seeds. [From the Malayan name.] A monotypic genus.

1. **Cajan Cajan** (L.) Millsp. Field Mus. Bot. 2: 53. 1900.

Cytisus Cajan L. Sp. Pl. 739. 1753.

Cajanus bicolor DC. Cat. Hort. Monsp. 85. 1813.

Cajanus flavus DC. Cat. Hort. Monsp. 85. 1813.

Cajanus indicus Spreng. Syst. 3: 248. 1826.

Cajanus luteus Bello, Ann. Soc. Esp. Hist. Nat. 10: 260. 1881.

Bushy, branched, 2 m. high or less. Leaves petioled; leaflets oblong or oblong-lanceolate, 2.5–8 cm. long, acute at both ends or obtuse at the base, velvety on both sides, dark green above, pale beneath; racemes few-flowered, as long as the leaves or longer; pedicels, rachis and calyx brown-pubescent; flowers 12–16 mm. broad; pods 5–8 cm. long, 10–12 mm. wide, 4–7-seeded; seeds whitish, somewhat flattened, about 4 mm. thick.

Banks, fields and hillsides, Porto Rico, spontaneous after cultivation for its seeds, in several races; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Bermuda; West Indies; continental tropical America and Old World tropics. Original home unknown. PIGEON-PEA. CONGO PEA. GANDUL. GANDURES.

39. **DOLICHOLUS** Medic. Vorles. Chur. Phys. Ges. 2: 354. 1787.

Perennial, twining, trailing or erect herbs, with pinnately 1-3-foliolate leaves, and yellow, mostly axillary and racemose flowers. Leaflets generally punctate with resinous dots, not stipellate. Calyx 4-5-lobed, somewhat 2-lipped; standard obovate or orbicular, spreading or reflexed; wings narrow; keel incurved at the apex or falcate; stamens diadelphous (9 and 1). Ovary nearly sessile; ovules 2, rarely 1; style filiform. Pod flat, oblong or obliquely orbicular, 2-valved, 1-2-seeded. [Greek, diminutive of *Dolichos*.] About 200 species, natives of warm and temperate regions, in Porto Rico known as FRIJOLILLO. Type species: *Dolichos minimus* L.

Pods constricted between the seeds.

1. *D. pyramidalis*.

Pods not constricted between the seeds.

Leaves prominently reticulate-veined beneath; calyx 7-12 mm. long, nearly as long as the corolla.

2. *D. reticulatus*.

Leaves not prominently reticulate-veined; calyx 2-3 mm. long, about half as long as the corolla.

3. *D. minimus*.

1. **Dolicholus pyramidalis** (Lam.) Britton & Wilson.

Dolichos pyramidalis Lam. Encycl. 2: 296. 1786.

Glycine phaseoloides Sw. Prodr. 105. 1788.

Rhynchosia phaseoloides DC. Prodr. 2: 385. 1825.

Dolicholus phaseoloides Sw. Kuntze, Rev. Gen. Pl. 3: 62. 1898.

A trailing or climbing vine, up to 7 m. long, the stem flattened, the branches and shoots densely and finely pubescent. Leaves mostly long-petioled; leaflets thin, ovate or rhombic-ovate, 3-12 cm. long, sparingly pubescent above, densely puberulent or tomentulose beneath, the apex acute or acuminate, the base obtuse or subtruncate, the terminal one long-stalked; racemes several-many-flowered, 5-15 cm. long; pedicels 1-2 mm. long; calyx 3-4 mm. long; corolla brownish-yellow, the standard 8-10 mm. long; pods compressed, 1.5-2.5 cm. long, usually 2-seeded, constricted between the seeds; seeds scarlet with a black end or side, or black nearly all over.

Woodlands and thickets, Porto Rico, at lower and middle elevations in wet or moist districts; St. Thomas (according to Eggers):—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

2. **Dolicholus reticulatus** (Sw.) Millsp. Field Mus. Bot. 2: 53. 1900.

Glycine reticulata Sw. Prodr. 105. 1788.

Rhynchosia reticulata DC. Prodr. 2: 385. 1825.

A pubescent or tomentose twining or trailing vine often 5 m. long. Leaves petioled, 3-foliolate; leaflets ovate to ovate-lanceolate or ovate-elliptic, 5-10 cm. long, reticulate-veined, acuminate, acute or obtuse at the apex, obtuse or rounded at the base, the terminal one long-stalked, the lateral ones nearly sessile; racemes several-many-flowered, shorter than the leaves; pedicels very short; calyx 7-12 mm. long, deeply 4-cleft, the lobes lanceolate, acuminate; corolla yellow, a little longer than the calyx-lobes; pod flat, lunate, 2-2.5 cm. long, 6-9 mm. wide, its valves twisting in drying; seeds nearly black.

Thickets at lower and middle elevations, Porto Rico; Mona; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—West Indies; continental tropical America.

3. **Dolicholus minimus** (L.) Medic. Vorl. Chur. Phys. Ges. 2: 354. 1787.

Dolichos minimus L. Sp. Pl. 726. 1753.

Rhynchosia minima DC. Prodr. 2: 385. 1825.

A slender, puberulent or pubescent, resinous-dotted, more or less branched vine, 3–12 dm. long, trailing or twining. Stipules subulate, about 2 mm. long, caducous; petioles very slender, 1–4 cm. long; leaflets 3, rhombic-ovate or rhombic-orbicular, obtuse or acute at the apex, obtuse at the base, the terminal one slender-stalked, 1–3 cm. long, the lateral ones short-stalked, smaller or as large, inequilateral; racemes slender, several-flowered, mostly as long as the leaves or longer; pedicels very short; calyx 2–3 mm. long, its lobes lanceolate-subulate; corolla yellow; standard orbicular-obovate, retuse, 5–6 mm. long; pods falcate, 10–17 mm. long, about 4 mm. wide, puberulent; seeds brown, mottled. [? *Rhynchosia caribaea* of Krebs.]

Thickets and hillsides at lower and middle elevations, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; West Indies; continental tropical America and Old World tropics.

40. **CALOPOGONIUM** Desv. Ann. Sci. Nat. I. 9: 423. 1826.

Twining vines, herbaceous, or woody toward the base, with 3-foliolate leaves, the leaflets stipellate, the small, blue or violet flowers nodose-racemose, the pedicels short. Calyx 2-lobed, the upper lobe 2-toothed, the lower 3-parted. Standard obovate, auricled; wings narrow, adherent to the short blunt keel. Vexillar stamen free from the others. Ovary several-many-ovuled; style naked; stigma terminal, capitate. Pod linear, compressed, 2-valved. Seeds orbicular, compressed. [Greek, beautiful beard.] About 8 species, of tropical America. Type species: *Calopogonium mucunoides* Desv.

Corolla about twice as long as the calyx; pods 6–8 mm. wide.
Corolla about as long as the calyx; pods about 4 mm. wide.

1. *C. coeruleum*.
2. *C. orthocarpum*.

1. **Calopogonium coeruleum** Benth.; Sauvalle, Ann. Acad. Habana 5: 337. 1869.

Stenolobium coeruleum Benth. Ann. Wien. Mus. 2: 125. 1837.

A rather stout vine, up to 6 m. long or longer, the twigs, foliage and inflorescence pubescent. Leaflets rhombic-ovate, entire, or 3-lobed, 5–8 cm. long, obtuse or acutish, the lateral ones very oblique; inflorescence usually long-stalked, many-flowered and longer than the leaves; calyx about 4 mm. long, villous, about half as long as the blue corolla, its lower teeth ovate-lanceolate, acuminate; pods 5–8 cm. long, 6–8 mm. wide, the valves slightly impressed between the seeds.

Hillside, Agricultural Experiment Station, Mayaguez, 1913, apparently naturalized:—Cuba; St. Vincent; Tobago; Trinidad; continental tropical America. Occasionally planted for ornament in Porto Rico.

2. **Calopogonium orthocarpum** Urban, Symb. Ant. 1: 327. 1899.

A slender vine, twining or creeping, 1 m. long or longer, somewhat woody below, the stems, petioles and inflorescence densely villous with brown spreading hairs. Leaflets ovate, 2.5–10 cm. long, entire, acute or obtusish, appressed-pubescent on both sides, the lateral ones oblique; inflorescence stalked or nearly sessile, often longer than the leaves, several-flowered, the pedicels very short; calyx 6–8 mm. long, its lower teeth lanceolate-subulate; corolla blue, about as long as the calyx; pod 2–3.5 cm. long, about 4 mm. wide, villous, impressed between the seeds. [*Stenolobium coeruleum* of Bello and of Cook and Collins, not of Bentham.]

Thickets, fields, hillsides and in cultivated grounds, Porto Rico, at lower and middle elevations in moist districts:—Cuba; Hispaniola. JICANA.

41. **GALACTIA** P. Br.; Adans. Fam. Pl. 2: 322. 1763.

Perennial vines (some species erect and shrubby), mainly with pinnately 3-foliolate leaves, small and deciduous stipules, and small or large axillary racemose flowers. Calyx 4-lobed, bracteolate, the lobes acute, often as long as the tube. Standard orbicular or obovate. Wings narrow, obovate, adherent to the narrow, nearly straight keel. Stamens diadelphous or nearly so (9 and 1). Ovary nearly sessile; ovules ∞ ; style filiform, not bearded. Pod linear, straight or slightly curved, usually flattened, 2-valved, several-seeded. Fleshy few-seeded pods are sometimes produced from subterranean apetalous flowers. [Greek, milk-yielding, the typical species described as having milky branches.] About 70 species, natives of warm and temperate regions, most abundant in America. Type species: *Glycine Galactia* L.

Standard 17–21 mm. long.

Standard 8–15 mm. long.

Leaflets mostly large, 3–6 cm. long; inflorescence usually elongated and long-peduncled; pod 6–9 mm. wide.

Leaflets small, 0.8–4 cm. long; pod about 5 mm. wide.

1. *G. Eggersii*.

2. *G. striata*.

3. *G. dubia*.

1. **Galactia Eggersii** Urban, Symb. Ant. 2: 311. 1900.

Stem very slender, twining, 1 m. long or longer, sparingly appressed-pubescent or, when old, glabrous. Stipules subulate, 2–3 mm. long; leaflets oval to ovate or obovate, 1.5–3 cm. long, chartaceous, obtuse, rounded or slightly emarginate, the base rounded, glabrous above, appressed-pubescent beneath, reticulate-veined; peduncles 1–7 cm. long, 1–few-flowered; pedicels 8 mm. long or less; calyx appressed-pilose, 10–12 mm. long, the segments lanceolate, acuminate; standard red-purple to scarlet, 17–21 mm. long, reflexed; keel pale purple, about as long as the standard; pod about 7 cm. long and 6–7 mm. wide, appressed-pubescent. [*G. tenuiflora* of Eggers in part; *G. pendula* of Krebs, not of Persoon.]

Hillsides, St. Thomas; St. Jan. Endemic.

2. **Galactia striata** (Jacq.) Urban, Symb. Ant. 2: 320. 1900.

Glycine striata Jacq. Hort. Vind. 1: 32, pl. 76. 1770.

Odonia tomentosa Bertol. Lucubr. 25. 1822.

Galactia Berteriana DC. Prodr. 2: 238. 1825.

G. striata tomentosa Urban, Symb. Ant. 2: 321. 1900.

G. striata Berteriana Urban, Symb. Ant. 2: 322. 1900.

Twining, up to 5 m. long or longer, the stems, leaves and inflorescence sparingly pubescent to tomentose. Stipules 2–4 mm. long, subulate; leaflets submembranous, ovate or ovate-elliptic, 3–6 cm. long, the apex obtuse or acutish, the base mostly rounded; inflorescence slender-peduncled, usually several-many-flowered and longer than the leaves, but sometimes not over 3 cm. long; pedicels 2–3 mm. long; calyx 7–8 mm. long, its lanceolate segments about twice as long as the tube; standard purple or purplish, 8–10 mm. long, about as long as the keel; pod 3–7 cm. long, 6–9 mm. wide, more or less pubescent. [*G. filiformis* of Bello, not of Bentham; *G. tomentosa* of Urban, not of Sprengel.]

Thickets and hillsides at lower and middle elevations, Porto Rico; Mona; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Jamaica; Cuba; Hispaniola; Martinique; Trinidad; northern South America. Consists of many races, differing in size of leaflets, color of flowers, size of pods, and in pubescence, the more hairy ones inhabiting dry districts. Specimens from a hillside between Aibonito and Coamo have leaflets only 1.5–3 cm. long, and short few-flowered inflorescence, but the pods are those of this species; a race on Mona Island has small leaflets and smaller pods than typical.

3. *Galactia dubia* DC. Prodr. 2: 238. 1825.*G. dubia Ehrenbergii* Urban, Symb. Ant. 2: 318. 1900.*G. dubia guanicensis* Urban, Symb. Ant. 2: 318. 1900.

Stem slender, twining, up to 2 m. long, glabrate to densely appressed-pubescent. Stipules lanceolate, acuminate, 2-3 mm. long; leaflets oval to oval-obovate, chartaceous, 1.5-4 cm. long, glabrous or pilose above, appressed-pilose especially on the veins beneath, the apex rounded and usually emarginate, the base rounded; inflorescence usually short and short-peduncled, few-flowered; pedicels 3-6 mm. long; calyx 7-8 mm. long, glabrous or pilose, its segments lanceolate; flowers white, pink, purple or lavender, the standard 12-15 mm. long, about as long as the keel; pod 3-6 cm. long, 5-6 mm. wide, appressed-pilose. [*G. tenuiflora* of Eggers, in part; *G. regularis* of Millspaugh; *G. filiformis minor* + *villosa* forma *albida* of Kuntze; *G. filiformis* of Stahl, not of Bentham.]

Thickets at lower elevations, mostly near the coast, Porto Rico, locally extending inland; Icacos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Anguilla to Guadeloupe.

42. **DIOCLEA** H. B. K. Nov. Gen. 6: 437. 1824.

Twining, more or less woody vines, with pinnately 3-foliolate leaves and no-rose-racemose, rather large flowers. Calyx campanulate, 4-lobed. Standard broad, rounded or emarginate, auricled at the base; wings oblique, clawed; keel slightly curved. Vexillar stamen more or less united with the others. Style glabrous. Pod more or less compressed, the upper margin thickened. [Commemorates Diocles, a physician of ancient Greece.] About 30 species, mostly of tropical America. Type species: *Dioclea sericea* H. B. K.

1. *Dioclea reflexa* Hook. f. in Hook. Niger Fl. 306. 1849.

Stem thick, 8 m. long or longer, climbing on trees, the twigs, petioles and inflorescence long-pilose with brown hairs, or glabrate. Leaflets elliptic, chartaceous, strigose beneath, at least on the veins, 7-10 cm. long, abruptly short-pointed, the base rounded; peduncles stout, usually longer than the leaves; raceme several-many-flowered; bracts linear-lanceolate, reflexed, pubescent, 1.5-2 cm. long; calyx silky, about 1.5 cm. long; flowers reddish to violet; standard about 2 cm. long; pod woody, oblong, 5-12 cm. long, 4-6 cm. wide, 1-4-seeded; seeds 2-3 cm. long.

Forests and hillside thickets at middle elevations, southeastern districts of Porto Rico:—Jamaica; Cuba; Dominica to Trinidad; continental tropical America; tropical Africa. The specific identity of the West Indian plant with the typical one of Africa is not certainly determined. BEJUCO DE MATO. MAYA PRIETA.

43. **CANAVALI** Adans. Fam. Pl. 2: 325. 1763.

Perennial herbs, with prostrate or twining stems. Leaves pinnately 3-foliolate; leaflets chartaceous or thick. Flowers large, in axillary peduncled racemes. Calyx 3-lipped, the upper lip truncate or 2-lobed, the lower one entire or 3-lobed. Standard reflexed, suborbicular; wings curved or twisted; keel-petals incurved, broader than the wings, obtuse or with an inflexed or spiral beak. Stamens diadelphous (9 and 1) or monadelphous to the middle. Style glabrous, incurved. Ovules several. Pod flat or slightly swollen, oblong or broadly linear, 2-valved. Seeds white, red or brown. [Aboriginal name in the South Sea Islands.] About 15 species, natives of tropical regions. Type species: *Dolichos ensiformis* L.

Leaflets ovate to elliptic, thin.

Seeds crimson.

Seeds white or whitish.

Leaflets orbicular to obovate, thick, rounded.

1. *C. rusiosperma*.

2. *C. ensiformis*.

3. *C. maritima*.

1. **Canavali rusiosperma** Urban, Symb. Ant. 1: 473. 1900.

High-climbing, the old stems sometimes 10 cm. thick near the base, glabrous, or the young twigs sparingly pubescent. Leaflets subchartaceous, ovate to elliptic, acutish, short-acuminate or obtuse, 5–10 cm. long; inflorescence 5–25 cm. long; pedicels 2–4 mm. long; calyx 10–12 mm. long; corolla red, the standard about twice as long as the calyx; pod linear-oblong, compressed, 10–25 cm. long, 4–5 cm. wide, 2-ribbed near the suture; seeds suborbicular, crimson, 1.5–2 cm. wide, 12–17 mm. thick. [*C. parviflora* of Eggers, not of Bentham; *C. gladiata* of Bello, not of de Candolle.]

Mountain forests in the western districts of Porto Rico; St. Thomas:—Hispaniola. MATO COLORADO.

2. **Canavali ensiformis** (L.) DC. Prodr. 2: 404. 1825.

Dolichos ensiformis L. Sp. Pl. 725. 1753.

Malocchia gladiata Savi, Nuov. Giorn. Pisa 8: 116. 1824.

Canavali gladiata DC. Prodr. 2: 404. 1825.

Climbing, sometimes 10 m. long or longer, glabrous, or when young finely pubescent. Leaflets thin, ovate or oblong-ovate, 5–12 cm. long, acute or short-acuminate at the apex, obtuse at the base; racemes several-many-flowered, mostly longer than the leaves; pedicels short, thick, 5 mm. long, or less; calyx 1–1.5 cm. long; corolla white to purple, longer than the calyx; pod broadly linear, flat, 1–2.5 dm. long, about 2 cm. wide; seeds oblong, white or whitish. [*C. gladiata ensiformis* of Eggers.]

Spontaneous after cultivation for its seeds, Porto Rico; St. Thomas:—widely cultivated in temperate and tropical regions. Native of the East Indies. HORSE BEAN. SWORD BEAN.

3. **Canavali maritima** (Aubl.) Thou. in Desv. Journ. Bot. 1: 80. 1813.

Dolichos maritimus Aubl. Pl. Guian. 2: 765. 1775.

Dolichos obtusifolius Lam. Encycl. 2: 295. 1786.

Dolichos rotundifolius Vahl, Symb. Ant. 2: 81. 1794.

Canavalia obtusifolia DC. Prodr. 2: 404. 1825.

Cilitoria rotundifolia Sessé & Moc. Fl. Mex. ed. 2, 172. 1894.

Foliage finely strigillose. Stems prostrate or climbing, 1–5 m. long, branching; leaflets leathery, suborbicular to oval or obovate, 4–10 cm. long, obtuse at the apex, rounded or broadly cuneate at the base; racemes surpassing the subtending leaves; peduncles often longer than the racemes; pedicels spur-like; calyx helmet-like, 14–17 mm. long, constricted at the base; corolla pink; pods broadly linear, 10–12 cm. long; seeds oblong, brown.

Coastal sands and rocks, Porto Rico; Mona; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; Bermuda; West Indies; continental tropical America; Old World tropics. BAY-BEAN. MATO DE LA PLAYA.

44. **PHASEOLUS** L. Sp. Pl. 723. 1753.

Vines, rarely erect herbs, with pinnately 3-foliolate leaves, and axillary racemose flowers. Calyx 5-toothed or 5-lobed, or the 2 upper teeth more or less united. Standard orbicular, recurved, spreading or somewhat contorted; wings mainly obovate; keel spirally coiled, linear or obovoid. Stamens diadelphous (9 and 1). Style longitudinally bearded; stigma oblique or lateral; ovary sessile or nearly so; ovules ∞ . Pod various, 2-valved, several-seeded, tipped with the persistent style. Seeds mostly with rounded ends. Rachis thickened at the bases of the pedicels. [Ancient name of the Kidney bean.] About 170 species, of warm and temperate regions. Type species: *Phaseolus vulgaris* L.

- Pod compressed or flat, 6–15 mm. wide; calyx-teeth mostly 4; mostly vines.
 Pod lunate.
 Pod linear, straight or a little curved.
 Standard 2–2.5 cm. long.
 Standard 1.5 cm. long or less.
 Pod flat, 3–4 cm. long; flowers yellow.
 Pod turgid, 10–15 cm. long.
 Pod subcylindric, 2–3 mm. wide; calyx-teeth 5; plant herbaceous; suberect.

1. *P. lunatus*.
2. *P. adenanthus*.
3. *P. trichocarpus*.
4. *P. vulgaris*.
5. *P. lathyroides*.

1. **Phaseolus lunatus** L. Sp. Pl. 724. 1753.

Phaseolus portoricensis Bert.; Spreng. Syst. 3: 253. 1826.

A usually annual, herbaceous, sparingly pubescent vine up to 3 m. long or longer, twining or trailing. Leaves rather large, petioled; leaflets ovate-lanceolate or rhombic-ovate, thin in texture, 4–7 cm. long, acute at the apex, obtuse or subtruncate at the base; the terminal one long-stalked, equilateral, the others short-stalked, inequilateral; racemes peduncled, about as long as the leaves, sometimes longer, several-many-flowered; pedicels slender, mostly less than 1 cm. long; calyx campanulate, about 3 mm. long, its 4 teeth short, ovate; bractlets oblong, about one-half as long as the calyx; corolla greenish white, the standard about 7 mm. broad; pod flat, lunate or subfalcate, 3–7 cm. long, 1–1.5 cm. wide (larger in cultivated races); seed; oblong or subquadrate, flattened.

Thickets at lower and middle elevations and spontaneous after cultivation in Porto Rico; St. Croix; St. Thomas; St. Jan.—West Indies; continental tropical America. Widely cultivated for its seeds in tropical and temperate regions. LIMA BEAN. BROAD BEAN. HABAS.

2. **Phaseolus adenanthus** G. F. W. Meyer, Prim. Esseq. 239. 1818.

Phaseolus truxillensis H. B. K. Nov. Gen. 6: 451. 1823.

Perennial, twining, sparingly pubescent, up to 6 m. long or longer. Leaflets ovate to elliptic-ovate or lanceolate, 5–10 cm. long, acute or short-acuminate, the petiolules and the veins on the underside usually pubescent; inflorescence about as long as the leaves, or shorter, few-several-flowered; calyx about 4 mm. long, 4-toothed, longer than the bractlets, the upper tooth broad, emarginate, the lateral ones lanceolate, acuminate; flowers variegated, white, yellow and purple, fragrant; standard 2–2.5 cm. long; pod linear, flat, usually a little curved, 8–10 cm. long, 8–12 mm. wide, 10–15 seeded. [*Phaseolus cochleatus* of Bello, not of Vellozo.]

Moist thickets and banks at lower elevations, Porto Rico;—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America and Old World tropics. WILD BEAN. HABICUELA CIMARRONA.

3. **Phaseolus trichocarpus** C. Wright; Sauvalle, Anales Acad. Habana 5: 337. 1868.

Phaseolus lanceolatus Bello, Ann. Soc. Esp. Hist. Nat. 10: 262. 1881.

Perennial, trailing or twining, slender; stems villous-pubescent or glabrate, 7 dm. long or longer. Leaflets lanceolate to ovate-lanceolate, 3–8 cm. long, sparingly pubescent or glabrous, acute or acuminate, the petiolules pubescent; peduncles mostly longer than the leaves, few-flowered at the end, the narrow bractlets longer than the calyx; flowers bright yellow; calyx 4-toothed, about 3 mm. long, the teeth rounded; standard about 10 mm. long, emarginate; pod flat, nearly straight, 3–4 cm. long, about 6 mm. wide, loosely pubescent. [*P. ovatus* of Urban, not of Bentham.]

Moist thickets and in wet white sand, northern and western districts of Porto Rico;—Cuba. The stipules in this species are posteriorly prolonged.

4. **Phaseolus vulgaris** L. Sp. Pl. 723. 1753.

Annual, glabrate, erect and 6 dm. high or less, or twining and up to 3 m. long, consisting of many races. Leaflets ovate, 3–15 cm. long, acute or acuminate; racemes mostly shorter than the leaves, sometimes very short; pedicels a little longer than the calyx, 6–10 mm. long in fruit; bractlets 5–6 mm. long; flowers white to purple; calyx about 4 mm. long, its 4 teeth broad; standard 10–13 mm. long; pod linear, straight or somewhat curved, several-seeded, 10–15 cm. long, 10–15 mm. wide, turgid.

Spontaneous after cultivation, Porto Rico; St. Croix; St. Thomas; St. Jan.:—widely cultivated for its seeds in temperate and tropical regions, its original home unknown. KIDNEY BEAN. HABICHUELA.

5. **Phaseolus lathyroides** L. Sp. Pl. ed. 2, 1018. 1763.

Phaseolus semirectus L. Mant. 1: 100. 1767.

Herbaceous, erect or ascending, simple or somewhat branched, silky pubescent or glabrate, 3–10 dm. long. Stipules narrowly lanceolate, acuminate, 1.5 cm. long or less; petioles slender; leaflets various, membranous, ovate to lanceolate or linear-lanceolate, 2–6 cm. long, acute, obtuse or acuminate at the apex, acute or obtuse at the base; racemes elongated, several-many-flowered, 1–3 dm. long in fruit; pedicels very short; calyx 4–5 mm. long, 5-toothed, its upper teeth ovate, the lower lanceolate, acuminate; corolla red or purple; standard 12–15 mm. long; pods narrowly linear, straight or a little curved, reflexed-spreading, 7–12 cm. long, about 3 mm. thick.

Fields, banks, sand dunes and hillsides, Porto Rico, at lower and middle elevations; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; continental tropical America and Old World tropics. Sometimes a weed in cultivated grounds. WILD BUSH BEAN. HABICHUELA PARADA. PHASEMY.

Phaseolus aureus Roxb., MUNG BEAN, Asiatic, cultivated in Porto Rico and the Virgin Islands, is an herbaceous annual about 3 dm. high, with ovate glabrous leaflets 3–5 cm. long, clustered yellow flowers about 1.5 cm. long and linear pods 3–6 cm. long.

Phaseolus alatus L., recorded from St. Croix by West, is not further determined; the species is not understood by modern botanists.

Phaseolus Caracalla L., CARACOL, SNAIL-FLOWER, of South America, has been grown in Porto Rico for ornament; it is a long twining perennial, with ovate acute leaflets, and large showy yellow-purple, racemose flowers, the keel coiled like the shell of a snail.

Phaseolus multiflorus Willd., a Mexican species, was listed by Krebs as formerly growing in St. Thomas, with the English name FRENCH BEAN, probably mistaken for some other plant of this family.

Urban records a *Phaseolus* with deformed flowers cultivated near Lares, the species undetermined.

45. **VIGNA** Savi, Mem. Phas. 3: 7. 1826.

Herbaceous vines, or sometimes erect herbs, with pinnately 3-foliolate stipulate leaves, the leaflets broad. Flowers clustered at the end of long axillary peduncles, yellowish or purplish, the rachis of the head or raceme knotty, the bracts and bractlets early deciduous. Calyx 4–5-toothed, or the 2 upper teeth united. Standard nearly orbicular, auricled at the base; wings shorter than

the standard; keel about equalling the standard, incurved. Stamens diadelphous (9 and 1). Ovary sessile; ovules numerous; style bearded along the inner side; stigma oblique. Pod linear, nearly terete, 2-valved. [In honor of Domenico Vigna, a commentator on Theophrastus.] About 30 species, natives of warm and tropical regions. Type species: *Dolichos luteolus* Jacq.

Stipules not auricled.

Stem and petioles pilose; standard 2-2.5 cm. long.

Glabrous or sparingly pubescent; standard 1-2 cm. long.

Flowers yellow or yellowish-brown.

Leaflets acute.

Leaflets rounded or emarginate.

Flowers purple or purplish or blue.

Standard 2 cm. long; pod 8-13 cm. long; leaflets 5-7 cm.

long.

Standard 1.5 cm. long; pod 6-8 cm. long; leaflets 2-5

cm. long.

Stipules auricled.

1. *V. vexillata*.

2. *V. repens*.

3. *V. marina*.

4. *V. antillana*.

5. *V. peduncularis*.

6. *V. unguiculata*.

1. ***Vigna vexillata*** (L.) A. Rich. in Sagra, Hist. Cub. **10**: 191. 1845.

Phaseolus vexillatus L. Sp. Pl. 724. 1753.

Dolichos vexillatus H. B. K. Nov. Gen. **6**: 440. 1823.

Twining, up to 4 or 5 m. long, the stem and petioles more or less pilose. Stipules lanceolate, striate, acuminate, 6-9 mm. long; leaflets ovate, elliptic or lanceolate, 4-8 cm. long, acute or acuminate, pubescent or glabrate; peduncles elongated, bearing 2-5 nearly sessile flowers at the end; calyx deeply 5-lobed, about 1.5 cm. long, the lanceolate-subulate lobes longer than the tube; flowers yellow, variegated with purple; standard 2-2.5 cm. long; pod 7-10 cm. long, about 4 mm. thick. [*V. capensis* of Cook and Collins.]

Fields and roadsides, Porto Rico, at lower and middle elevations in moist districts:—Cuba; Hispaniola; St. Vincent; Grenada; Tobago; Trinidad; continental tropical America and Old World tropics. Recorded by Krebs from St. Thomas.

2. ***Vigna repens*** (L.) Kuntze, Rev. Gen. Pl. 212. 1891.

Dolichos repens L. Syst. ed. 10, 1163. 1759.

Dolichos luteolus Jacq. Hort. Vind. **1**: 39, pl. 90. 1770.

Vigna glabra Savì, Oss. Phas. **3**: 8. 1822.

Vigna luteola Benth. in Mart. Fl. Bras. **15**¹: 194. 1859.

Orobus trifoliatius Sessé & Moc. Fl. Mex. ed. 2, 167. 1894.

Foliage glabrous or pubescent with appressed hairs. Stems 1-2 m. long, trailing or climbing, branching, when pubescent the hairs reflexed; stipules ovate, about 3 mm. long; leaflets ovate to lanceolate or linear, 2-8 cm. long, acute, more or less distinctly reticulated, short-stalked; petioles usually longer than the leaflets; peduncles surpassing the leaves, retrorsely pubescent and few-flowered at the top; pedicels 1-3 mm. long, corymbose; calyx campanulate, oblique, its lobes triangular to lanceolate; corolla yellowish brown; standard nearly reniform, notched, less than 2 cm. long; pods linear, 4-5 mm. long, nearly terete, pubescent. [*Bradburja pubescens* of Millspaugh, from St. Thomas; ? *Dolichos luteus* of West, St. Croix.]

Thickets and roadsides at lower elevations, Porto Rico, ascending to at least 500 m.; Vieques; Culebra; St. Croix; St. Thomas; St. Jan.—southern United States; Bermuda; West Indies; continental tropical America and Old World tropics and subtropics.

3. ***Vigna marina*** (Burm.) Merrill, Interp. Rumph. Herb. 285. 1917.

Phaseolus marinus Burm. Index Univ. Herb. Amb. 7. 1755.

Dolichos luteus Sw. Prodr. 105. 1788.

Vigna lutea A. Gray, Bot. Wilkes Exp. 452. 1854.

Twining, glabrate, up to 2 m. long or longer. Stipules triangular-lanceolate, acuminate, 3-4 mm. long; leaflets ovate to elliptic or suborbicular, obtuse and rounded or emarginate, 4-10 cm. long; peduncles elongated, retrorsely pubescent at the end and corymbosely or racemosely few-several-flowered; flowers yellow; calyx about 4 mm. long, its teeth triangular-ovate; standard about 1 cm. long; pods linear, reflexed, about 5 cm. long and 6 mm. thick, glabrous when old.

Punta Cangrejos, Porto Rico, collected by J. A. Stevenson in 1914;—Florida; Jamaica (?); Cuba. Native of the Old World tropics and subtropics. Recorded by Krebs from St. Thomas.

4. **Vigna antillana** (Urban) Fawcett & Rendle, Fl. Jam. 4²: 69. 1920.

Phaseolus antillanus Urban, Symb. Ant. 4: 309. 1905.

Sparingly pubescent, twining, up to 7 m. long. Stipules ovate-oblong, obtuse or acutish, 3-4 mm. long; leaflets ovate to ovate-oblong, 5-7 cm. long, acute or acuminate, short-pilose or nearly glabrous; peduncles elongated, few-several-flowered; pedicels 3-4 mm. long in fruit; bractlets 2-4 mm. long; flowers blue or purple; calyx 5-6 mm. long, the lobes ovate, the upper one truncate; standard about 2 cm. long; pod linear, a little curved, 8-13 cm. long, 4-5 mm. thick, long-beaked. [*V. unguiculata* of Piper.]

Banks and thickets at lower and middle elevations in moist districts, Porto Rico; Vieques; Tortola;—Jamaica; Cuba; Hispaniola; Martinique; St. Vincent.

5. **Vigna peduncularis** (H. B. K.) Fawcett & Rendle, Fl. Jam. 4²: 68. 1920.

Phaseolus peduncularis H. B. K. Nov. Gen. 6: 447. 1824.

Twining or trailing, slender, sparingly pubescent or glabrous. Stipules oblong-lanceolate, about 4 mm. long; leaflets ovate or triangular-ovate, 2-5 cm. long, acute or acuminate; peduncles as long as the leaves, or much longer; raceme few-several-flowered; pedicels 1-2 mm. long; flowers purplish, violet or pinkish; calyx about 4 mm. long, its teeth ovate, the upper one rounded; standard 1-1.5 cm. long; pod linear, 6-8 cm. long, 3-5 mm. thick.

Collected by F. L. Stevens at Aguada in 1913;—Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America.

6. **Vigna unguiculata** (L.) Walp. Rep. 1: 779. 1842.

Dolichos unguiculatus L. Sp. Pl. 725. 1753.

Dolichos sinensis L. Cent. Pl. 2: 28. 1756.

Dolichos sesquipedalis L. Sp. Pl. ed. 2, 1019. 1763.

Dolichos Catjang L. Mant. 1: 259. 1767.

Dolichos monichalis Brot. Fl. Lusit. 2: 125. 1804.

Vigna Catjang Walp. Rep. 1: 779. 1842.

Vigna sinensis Endl.; Hassk. Pl. Jav. Rar. 386. 1848.

Erect or nearly so, or twining or trailing, glabrous, or somewhat pubescent. Stipules ovate or ovate-lanceolate, acuminate, auricled, 2 cm. long or less; leaflets ovate, acute or blunt, 5-15 cm. long; stipels about 3 mm. long; flowers few and nearly sessile at the end of a long peduncle, purplish or greenish yellow; calyx about 8 mm. long; standard about 2 cm. long; pods various, 1-4.5 dm. long, 7-10 mm. wide, rather fleshy.

Spontaneous, after cultivation in several races for its seeds, Porto Rico; St. Croix; St. Thomas. Widely cultivated in tropical regions; native of tropical Africa. FRIJOLE. LENTEJAS. BLACK-EYED PEA. COW PEA. HALIFAX PEA.

46. **CACARA** Rumph.; Thouars, Dict. Sci. Nat. 5: 35. 1805.

Twining, herbaceous vines, often with large tuberous roots, the leaflets pinnately 3-foliolate, the rather large flowers clustered-racemose, white, blue or violet. Calyx 4-lobed, the upper lobe emarginate. Standard rounded,

auricled at the base; wings oblique, about as long as the standard; keel little curved. Vexillar stamen free from the others. Style flattened above, bearded on the inner side; stigma lateral, subglobose. Pod linear, flat, impressed between the seeds. [Malayan name.] Three or four species of tropical distribution. Type species: *Dolichos bulbosus* L.

1. **Cacara erosa** (L.) Kuntze, Rev. Gen. Pl. 165. 1891.

Dolichos erosus L. Sp. Pl. 726. 1753.

Dolichos bulbosus L. Sp. Pl. ed. 2, 1021. 1763.

Pachyrrhizus angulatus L. C. Rich.; DC. Prodr. 2: 402. 1825.

Pachyrrhizus erosus Urban, Symb. Ant. 4: 311. 1905.

Springly pilose or glabrate, slender, 1–2 m. long. Leaflets thin, 6–12 cm. long, coarsely angulate-dentate or nearly entire, the lateral ones obliquely rhombic-ovate, the terminal one cuneate-flabellate, usually broader than long, the teeth mostly acute or acuminate, sometimes aristate-tipped; peduncles stout, commonly longer than the leaves; raceme 1–2 dm. long; flowers blue, nearly sessile; calyx velvety, about 8 mm. long, its lower teeth acuminate; standard 12–16 mm. long; pod nearly straight, 10–12 cm. long, about 1.5 cm. wide.

Woodlands, hillsides and thickets at lower and middle elevations in moist districts, Porto Rico; St. Thomas:—West Indies; continental tropical America. Widely cultivated in tropical regions for its seeds. HABILLA.

Cacara tuberosa (Lam.) Britton, YAM BEAN, [*Pachyrrhizus tuberosus* Spreng.; *Dolichos tuberosus* Lam.], occasionally cultivated in Porto Rico, of unknown geographic origin, has similar foliage, but the leaflets mostly entire, the flowers white; it is widely cultivated in tropical regions.

47. **DOLICHOS** L. Sp. Pl. 725. 1753.

Climbing or trailing vines, with 3-foliolate stipellate leaves, and white to purple flowers variously clustered or sometimes solitary, their bracts small or caducous. Calyx campanulate, its two upper teeth united. Standard suborbicular; wings obovate, curved, adnate to the incurved keel. Stamens 9 and 1, their anthers all alike. Ovary several-many-ovuled; style bearded or penicillate below the terminal stigma. Pod flat, mostly somewhat curved, beaked. Seeds subglobose or flattened. [Greek name of some bean, referring to its long pods.] About 30 species, of tropical distribution. Type species: *Dolichos Lablab* L.

1. **Dolichos Lablab** L. Sp. Pl. 725. 1753.

Lablab vulgaris Savi, Diss. 19. 1821.

Dolichos benghalensis Jacq. Hort. Vind. 2: 57. 1772.

Springly pubescent, climbing or trailing, 5 m. long or less. Leaves long-petioled. Leaflets ovate, acute or acuminate, 4–10 cm. long, the terminal one equilateral and long-stalked, the others inequilateral and short-stalked; racemes axillary, several-flowered, longer than the leaves; flowers short-pedicelled, 1.5–2 cm. broad, white to purple; pods about 7.5 cm. long, nearly 2.5 cm. wide, the upper edge nearly straight, the lower curved and glandular-serrulate; seeds somewhat compressed, black with a white linear strophiole, about 1 cm. long. [*Dioclea Jacquiniana* of Bello, not of de Candolle; *Dolichos Lablab albiflorus* of Millspaugh.]

Spontaneous after cultivation, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola:—widely cultivated for its seeds and locally spontaneous in tropical and subtropical regions. Probably native of tropical Africa. A bushy race is sometimes cultivated. BLACK BEAN. CHICHARROS. FRIJOLAS CABALLEROS.

Dolichos sphaerospermus (L.) DC. [*Phaseolus sphaerospermus* L.], BLACK-EYED PEA, has been cultivated for its seeds in the Virgin Islands.

48. **MUCUNA** Adans. Fam. Pl. 2: 325. 1763.

Woody vines, with pinnately 3-foliolate leaves, and large, pedicelled flowers in axillary, long-peduncled clusters. Calyx campanulate, its two upper teeth connate. Standard folded, auricled at the base; wings incurved, longer than the standard; keel as long as the wings or longer, its apex cartilaginous or acute. Stamens diadelphous (9 and 1); anthers alternately longer and shorter. Ovary sessile, usually villous; ovules few; style naked, filiform; stigma terminal and small. Pod thick, coriaceous, linear or oblong, 2-valved, usually covered by stinging hairs, at least when young. Seeds orbicular, or oblong, few, large, with a thick testa and linear hilum. [Brazilian name.] About 25 species, mostly tropical. Type species: *Dolichos urens* L.

Leaflets elliptic, glabrous beneath.
Leaflets ovate, silky-pubescent beneath.

1. *M. urens*.
2. *M. Sloanei*.

1. **Mucuna urens** (L.) DC. Prodr. 2: 405. 1825.

Dolichos urens L. Syst. ed. 10, 1162. 1759.

Dolichos altissimus Jacq. Enum. 27. 1760.

Stizolobium altissimum Pers. Syn. 299. 1807.

Mucuna altissima DC. Prodr. 2: 405. 1825.

High-climbing, up to 10 m. long or longer, glabrous. Petioles as long as the leaflets or shorter; leaflets thin, glabrous on both sides, oblong to elliptic-lanceolate, 8–16 cm. long, abruptly acuminate; inflorescence pendulous; peduncle slender, up to 1.5 m. long, 1-several-flowered at the end; pedicels 2 cm. long or less, thickened in fruit; calyx about 1.5 cm. long; standard bluish purple, 3–4 cm. long; wings long-clawed, purple; keel yellowish, a little longer than the wings; pod woody, 8–20 cm. long, about 5 cm. wide, hispid with stinging hairs and finely pubescent, or nearly glabrous when old; seeds compressed-globose, 3–4 cm. in diameter.

[Forests and woodlands, Porto Rico, at lower and middle elevations in moist or wet districts;—Jamaica; Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.] Recorded by Krebs as found in St. Thomas prior to 1851. TORTERA. OX-EYE BEAN.

2. **Mucuna Sloanei** Fawcett & Rendle, Journ. Bot. 55: 36. 1917.

Dolichos urens Jacq. Enum. 27. 1760. Not L. 1759.

High-climbing, the young shoots appressed-pubescent. Petioles sparingly pubescent; leaflets rather thin, ovate, 6–10 cm. long, sparingly pubescent or glabrous and reticulate veined above, densely silky-pubescent beneath, acute or short-acuminate; peduncle as long as the petioles or somewhat longer, subumbellately few-several-flowered; pedicels about 1 cm. long or less; calyx nearly 2 cm. long, the lowest tooth nearly as long as the tube; corolla yellow; standard about 3 cm. long; wings 5–6 cm. long, short-clawed, the keel a little longer; pod woody, 10–15 cm. long, 4–5 cm. wide, hispid with stinging hairs and pubescent; seeds round, compressed, 2–3 cm. broad.

Woods and thickets in moist parts of the western districts of Porto Rico;—Florida; Jamaica; Hispaniola; Guadeloupe to Trinidad; continental tropical America; tropical Africa. MATOS. OJO DE BUEY. HORSE-EYE BEAN.

49. **STIZOLOBIUM** P. Br.; Medic. Vorles. Chur. Phys. Ges. 2: 399. 1787.

Annual vines, herbaceous or slightly woody, with thin, pinnately 3-foliolate leaves, and large short-pedicelled flowers in axillary racemes. Wings longer than the curved standard; keel mostly longer than the wings. Stamens diadelphous (9 and 1); alternate anthers longer. Ovary sessile, usually villous;

style filiform, glabrous; stigma small, terminal; ovules several-many. Pod linear, 2-valved, densely covered with stinging hairs or glabrous. Seeds oblong, shining, the testa thin, the hilum short. [Greek, referring to the stinging hairs.] Perhaps 20 species of tropical distribution. Type species: *Dolichos pruriens* L.

1. **Stizolobium prurimum** (Wight) Piper, Proc. Biol. Soc. Wash. **30**: 54. 1917.

Mucuna prurita Wight in Hook. Bot. Misc. **2**: 348. 1831.

Stizolobium prurimum officinale Piper, loc. cit. 57. 1917.

Slender, high-climbing, pubescent. Petioles as long as the leaflets or shorter; leaflets thin, appressed-pubescent, somewhat silvery beneath, the terminal one rather long-stalked, ovate or rhombic ovate, the lateral ones short-stalked, obliquely ovate, inequilateral; racemes several-many-flowered, elongated; calyx silvery-silky, about 1 cm. long, 4-cleft; corolla blue or purple; standard ovate; wings and keel about twice as long as the standard, 2-3 cm. long; pods narrowly oblong, slightly curved, 4-9 cm. long and 1 cm. thick, densely covered with brittle stinging hairs, pendent in clusters; seeds oblong, brown, shining, 8-10 mm. long. [*Mucuna pruriens* of authors, not of Medicus.]

Thickets, woodlands and river banks at lower elevations, Porto Rico; Vieques; St. Croix; St. Thomas;—West Indies; continental tropical America and Old World tropics. COW-ITCH. PICA-PICA.

Stizolobium Deeringianum Bort, VELVET BEAN, Asiatic, experimentally planted in Porto Rico, resembles *S. prurimum*, but the pods are nearly or quite devoid of stinging hairs.

50. **NEORUDOLPHIA** Britton.

[**RUDOLPHIA** Willd., not Medic.]

A woody vine, with pilose-pubescent twigs, petioles and inflorescence, small subulate stipules, petioled 1-foliolate leaves, and showy bright red, racemed flowers. Calyx tubular, minutely 2-bracteolate; its 2 broad upper teeth united except near the tips, the lateral teeth much smaller, the lanceolate lower tooth as long as the upper ones. Standard oblong, folded, short-clawed; wings and keel-petals small, similar, linear, distinct; stamens diadelphous (9 and 1); anthers ovate, all alike. Ovary short-stipitate, many-ovuled; style slender, somewhat hooked at the apex, the stigma obsolete. Pod linear, nearly sessile, flat, short-beaked, 2-valved, the valves coriaceous, finely pubescent, elastically dehiscent. Seeds numerous, obovate, or oblong, somewhat compressed, shining. [Commemorates Carl Asmund Rudolphi, 1771-1832, Danish botanist.] A monotypic Porto Rican genus.

1. **Neorudolphia volubilis** (Willd.) Britton.

Rudolphia volubilis Willd. Neue Schrift. Ges. Nat. Fr. Berlin **3**: 452. 1801.

Erythrina portoricensis Desv. Tabl. 191. Hyponym. 1804.

Butea volubilis Pers. Syn. **2**: 279. 1807.

Rudolphia scandens Poir. Dict. Sci. Nat. **46**: 419. 1827.

Rudolphia portoricensis Sweet, Hort. Brit. ed. 2, 161. Hyponym. 1830.

Rudolphia scricca Steud. Nom. ed. 2. **1**: 240. Hyponym. 1840.

Climbing to a length of 5 m. or more. Petioles 1.5-8 dm. long; stipules about 3 mm. long; stipels nearly filiform, 1.5-2 mm. long; leaflet ovate, 4-12 cm. long, cordate or rarely truncate at the base, acuminate at the apex, rather thick in texture, glabrous or pubescent above, sparingly pubescent or glabrous on the veins beneath; racemes 8-15 cm. long, floriferous nearly to the base.

pedicels 3-7 mm. long; bracts and bractlets lanceolate, acuminate, about 2 mm. long; calyx cherry-red, 1.5-2.5 cm. long; standard emarginate, rose, 4-4.5 cm. long; wings about 1 cm. long, 1 mm. wide, a little longer than the similar keel-petals; pod 6-8 cm. long, about 1 cm. wide; seeds about 6 mm. long.

Woodlands and thickets in moist or wet districts of Porto Rico, ascending to higher elevations. Endemic. BEJUCO DE ALAMBAC. BEJUCO COLORADO. BEJUCO PRIETO.

51. **ERYTHRINA** L. Sp. Pl. 706. 1753.

Trees, shrubs, rarely erect herbs, often with prickly stems and branches, the pinnately 3-foliolate leaves glandular-stipellate, the stipules small, the large and showy red, yellow to orange flowers racemose, usually in pairs or clustered at the nodes of the racemes, the bracts and bractlets small or none. Calyx various, truncate, spathaceous or toothed. Standard large, broad or elongated, sessile or clawed, not appendaged; wings small, sometimes none; keel smaller than the standard but larger than the wings, its petals distinct or united. Stamens monadelphous or diadelphous; anthers all alike. Ovary stipitate, many-ovuled; style incurved, not bearded; stigma small and terminal. Pod linear, stipitate, curved, constricted between the seeds, mostly 2-valved. [Greek, red, referring to the flowers of the typical species.] About 30 species, natives of tropical and warm-temperate regions. Type species: *Erythrina Corallodendron* L.

Standard narrowly oblong, elongated.

Calyx truncate, 6-12 mm. long, campanulate.

Leaves nearly or quite unarmed; standard 5-6 cm. long.

Leaves armed with prickles; standard 4-5 cm. long.

Calyx about 2 cm. long, tubular, its limb oblique.

Standard oblong to elliptic.

Leaflets broadly rhombic-ovate, acute or acuminate, thin.

Leaflets ovate to elliptic, obtuse, coriaceous.

1. *E. Corallodendrum*.

2. *E. horrida*.

3. *E. Berteroana*.

4. *E. Poeppigiana*.

5. *E. glauca*.

1. **Erythrina Corallodendrum** L. Sp. Pl. 706. 1753.

A tree, up to 8 m. high, but often shrubby, the trunk and stout branches armed with sharp prickles sometimes 2 cm. long. Leaves glabrous; petioles rather slender, 3-15 cm. long; leaflets rhombic-ovate, to rhombic-orbicular or broader than long, acute or acuminate at the apex, obtuse or rounded at the base. 5-15 cm. long; racemes 1-3 dm. long, several-many-flowered; pedicels very short; calyx campanulate, truncate, 7-12 mm. long; corolla coral-red, 5-6 cm. long, the wings little longer than the calyx; standard narrowly oblong or oblong-oblancoelate; keel-petals distinct, shorter than the calyx; stamens shorter than the standard; pod moniliform, somewhat flattened, beaked, 10-15 cm. long, 1-1.5 cm. wide; seeds scarlet, usually with a black spot.

Thickets and rocky hillsides, Porto Rico, mostly in dry districts at lower altitudes; St. Croix; St. Thomas; St. Jan;—Jamaica; Cuba; St. Kitts to Tobago; continental tropical America. PIÑON ESPINOSO. CORAL-TREE. BAUMORTEL.

2. **Erythrina horrida** Eggers, Bull. U. S. Nat. Mus. 13: 45. 1879.

A tree, up to 10 m. high, or sometimes shrubby, similar to *E. Corallodendrum*, perhaps not specifically distinct, the trunk and branches copiously armed with stout prickles. Foliage like that of *E. Corallodendrum*, but the petioles and veins of both surfaces of the leaves armed with yellowish straight prickles 4-8 mm. long; racemes about 10 cm. long; calyx campanulate, truncate, 6-8 mm. long; standard red, 4-5 cm. long, the wings and keel very small; pod 1-2 dm. long, long-beaked; seeds bright red, without a black spot.

Arroyos, southern dry districts, and on coastal limestone rocks, Quebradillas, Porto Rico; Vieques; St. Thomas; recorded by Eggers from St. Jan and St. Croix. Endemic. This is probably the tree recorded by Krebs from St. Thomas as *Erythrina spinosa*. COCK'S-SPUR.

3. *Erythrina Berteroana* Urban, Symb. Ant. 5: 370. 1908.

An unarmed glabrous tree up to 8 m. high. Petioles 8–18 cm. long; leaflets ovate to rhombic-ovate, 5–14 cm. long, acuminate or acute at the apex, obtuse, broadly cuneate or subtruncate at the base, pale beneath; racemes 3 dm. long or less; pedicels very short; calyx tubular, 18–23 mm. long, its limb oblique; standard coral-pink, 6–8 cm. long, linear-oblong, folded; wings about 1 cm. long, about as long as the oblong keel-petals; stamens shorter than the standard; pod moniliform, curved, about 10 cm. long, 1 cm. wide over the seeds, its subulate beak 2–4 cm. long; seeds oblong, vermilion, not spotted.

Roadsides, planted for fence-posts and naturalized in Porto Rico.—Cuba; Hispaniola; Colombia. MACHETE.

4. *Erythrina Poeppigiana* (Walp.) O. F. Cook, Bull. U. S. Dept. Agric. 25: 27. 1901.

Micropteryx Poeppigiana Walp. Linnaea 23: 740. 1850.

Erythrina micropteryx Poepp.; Urban, Symb. Ant. 1: 327. 1899.

A tree, up to 25 m. in height, the bark nearly smooth, the trunk and branches armed with stout prickles, or those of the trunk deciduous. Leaves often 3 dm. long, glabrous; leaflets broadly rhombic-ovate or sometimes broader than long, 7–16 cm. long, acute or short-acuminate at the apex, broadly cuneate to truncate at the base, the texture rather thin; racemes 1–2 dm. long, finely puberulent; pedicels rather stout, 5–9 mm. long; calyx turbinate, 5–7 mm. long, puberulent, truncate; standard oval to elliptic, 3–4 cm. long, orange; wings about 1 cm. long; keel-petals united, except at the tips, a little shorter than the standard, shorter than the style and stamens; pod compressed, 13 cm. long or less, 1–1.5 cm. wide, narrowed at both ends, slender-beaked; seeds flat, dark brown, about 1 cm. long. [*Erythrina umbrosa* of Bello, not of H. B. K.]

Widely planted for coffee-shade, and along roads and locally spontaneous in Porto Rico.—Jamaica; Cuba; Guadeloupe; Martinique; Trinidad. Native of Peru. BUCARE. PALO DE BOYO. BOIS IMMORTELLE.

5. *Erythrina glauca* Willd. Neue Schrift. Ges. Nat. Fr. Berlin 3: 428. 1801

A tree, up to 20 m. high, the trunk and branches armed with prickles, at least when young. Leaves often 3 dm. long; leaflets ovate to ovate-elliptic, 6–12 cm. long, glabrous, pale beneath, coriaceous in texture, mostly obtuse and rounded at the apex, rounded or very broadly cuneate at the base; racemes puberulent, 1–2 dm. long; pedicels stout, 1 cm. long or less; calyx broadly campanulate, puberulent, somewhat oblique, about 1 cm. long; standard orange, rhombic-suborbicular, folded, 5–6 cm. long, narrowed into a claw; wings oblong, brown with crimson tips, 2–2.5 cm. long; keel brown, somewhat longer than the wings, its petals united; stamens and style much longer than the keel; pod flattened, 2.5 dm. long or less, about 1.5 cm. wide; seeds oblong, subterete, 1.5–1.8 cm. long, about 6 mm. thick, rounded at both ends.

River banks and roadsides, northern districts of Porto Rico, appearing as if introduced; St. Thomas (ex Krebs).—Cuba; Guadeloupe; Martinique; St. Vincent; Tobago; Central America and Venezuela. Its wood is soft, light and weak. BUCAGO.

Erythrina indica Lam., Asiatic, planted as a roadside tree in the Virgin Islands, is a tree 10 m. high or higher, the branches prickly, the glabrous unarmed leaflets broadly ovate, the spathaceous calyx large, the petals scarlet, the standard ovate, the stout pods up to 2 dm. long and 2 cm. thick.

Erythrina Crista-galli L., COCKSPUR CORAL-TREE, South American, occasionally planted for ornament in Porto Rico and the Virgin Islands, is a small tree, with slender, sometimes vine-like branches, the glabrous, ovate-oblong, acute leaflets 6–8 cm. long, the slender-pedicelled, showy, crimson and scarlet flowers in large clusters, the broad standard reflexed.

Coursetia arborea Griseb., a small pinnate-leaved tree of Trinidad and Venezuela, is recorded by Grisebach from St. Jan, presumably an error in record or determination.

Codariocalyx gyrans (L.f.) Hassk., TELEGRAPH PLANT, East Indian, is occasionally planted for interest in Porto Rico and the Virgin Islands. It is a perennial herb, 1 m. high or less, with 3-foliolate leaves, the terminal leaflet oblong, 3-8 cm. long, the lateral ones similar in form but much smaller, and continuously moving in sunlight; the small flowers are in terminal racemes; the fruit is a linear, straight loment with quadrate joints. [*Hedysarum gyrans* L.f.; *Desmodium gyrans* DC.]

Lourea vespertilionis (L.) Desv. East Indian, planted for ornament on St. Croix and St. Thomas, was recorded by Eggers as naturalized in gardens, but it does not appear to have spread beyond cultivation. It is a puberulent, slender perennial herb, 5-6 dm. high, the curious leaf-blades much broader than long, somewhat 2-lobed, the white flowers in terminal racemes, the fruit a loment. [*Hedysarum vespertilionis* L.]

Pisum sativum L., PEA, of Old World origin, cultivated for its seeds in Porto Rico and the Virgin Islands, is an annual herbaceous vine, with pinnate leaves terminated by a tendril, rather large white or reddish flowers, the oblong swollen pods containing several globular seeds.

Lathyrus odoratus L., SWEET PEA., Sicilian, occasionally grown in Porto Rico flower gardens, is an herbaceous vine, the leaves with one pair of leaflets and a branched tendril, the showy flowers white, red or yellow. The early or winter-flowering varieties grow luxuriantly.

Robinia Pseudacacia L., BLACK LOCUST, NORTH AMERICAN ACACIA, of the eastern United States, experimentally planted by Mr. E. Murray Bruner in the Forest Service Nursery at Rio Piedras, Porto Rico, had in 1923 attained a height of about one meter, and flowered when only six months old. It is a pinnate-leaved tree, becoming, under favorable conditions, at least 20 m. high; the bark is very rough, rigid and furrowed, the wood durable; the fragrant white flowers are borne in drooping racemes. It can scarcely survive in the continuously warm climate of Porto Rico.

Hedysarum coronarium L., European, experimentally grown at the Insular Agricultural Experiment Station, Rio Piedras, 1923-1924, did not appear to thrive.

Dalbergia Sissoo Roxb., Asiatic, seen at the Agricultural Experiment Station at Mayaguez, is a tree with very slender branches, the leaves with 3-5, glabrous, broadly oval or suborbicular, cuspidate leaflets 2.5-5 cm. long, the rachis zigzag; the yellowish flowers are about 8 mm. long, in small axillary panicles; the linear few-seeded pod is flat, 4-10 cm. long.

Brya Ebenus L., WEST INDIAN EBONY, a small, yellow-flowered, hardwooded tree of Jamaica and Cuba, was erroneously recorded by Krebs from St. Thomas.

A pinnate-leaved tree about 10 m. high, the 5 leaflets ovate-elliptic, glabrous, 8-17 cm. long, the flat and thin, oblong 1-seeded fruits about 8 cm. long and 3 cm. wide is apparently a species of *Platymiscium*, planted in the park at St. Thomas.

Order 13. GERANIALES.

Herbs, shrubs or trees, usually with petals, and these separate (wanting in most Euphorbiaceae, and in some species of *Zanthoxylum* in Rutaceae); sepals mostly distinct; stamens few, rarely more than twice as many as the sepals, opposite them when as many; ovary superior, mostly compound; ovules pendulous, the raphe toward the axis of the ovary.

Petals present, usually as many as the sepals. (See *Zanthoxylum*.)

Flowers regular or nearly so (except in BALSAMINACEAE).

Tissues of the plant devoid of secreting cells or glands.		
Filaments united below or at the base.		
Petals unappendaged; leaves compound.	Fam. 1.	OXALIDACEAE.
Petals appendaged; leaves simple.	Fam. 2.	ERYTHROXYLACEAE.
Filaments separate.		
Calyx irregular; one sepal spurred or saccate.	Fam. 3.	BALSAMINACEAE.
Calyx regular.		
Styles united; leaves compound.	Fam. 4.	ZYGOPHYLLACEAE.
Styles mostly separate; leaves simple.	Fam. 5.	MALPIGIACEAE.
Tissues of the plant with secreting cells or glands.		
Leaves punctate.	Fam. 6.	RUTACEAE.
Leaves not punctate.		
Carpels separate.	Fam. 7.	SURIANACEAE.
Carpels united.		
Filaments separate.		
Trees or shrubs with bitter oil-bearing bark.	Fam. 8.	SIMAROUBACEAE.
Resiniferous trees and shrubs.	Fam. 9.	BURSERACEAE.
Filaments united.	Fam. 10.	MELIACEAE.
Flowers very irregular; petals 3; stamens mostly 8.	Fam. 11.	POLYGALACEAE.
Flowers often apetalous, monoecious; carpels mostly 3.	Fam. 12.	EUPHORBIACEAE.

Family 1. OXALIDACEAE Lindl.

WOOD-SORREL FAMILY.

Leafy-stemmed or acaulescent herbs, rarely shrubs or trees, often with rootstocks, or scaly bulbs, the sap sour. Leaves mostly palmately 3-foliate, in some tropical species pinnate, or entire and peltate; stipules commonly present as scarious expansions of the petiole-bases; leaflets mostly obovate. Flowers perfect, in umbel-like or forking cymes, or sometimes solitary; peduncles mostly long. Sepals 5, often unequal. Petals 5, white, pink, purple or yellow. Stamens 10-15, sometimes unequal. Ovary 5-celled, 5-lobed; styles coherent or distinct; ovules 2-many in each cavity; fruit a loculicidal globose or columnar capsule, rarely baccate. Embryo straight, in fleshy endosperm. About 15 genera and over 300 species, chiefly of tropical distribution.

Plants acaulescent, with coated bulbs; flowers not yellow.

1. *Ionoxalis*.

Plants caulescent, with rootstocks; flowers mostly yellow.

2. *Xanthoxalis*.

1. **IONOXALIS** Small, Fl. SE. U. S. 665. 1903.

Low, perennial acaulescent herbs, the leaves and scapes arising from coated scaly bulbs, the petioles long, the blades palmately 3-several-foliate, the violet, blue or white flowers in umbel-like cymes. Sepals 5, bearing apical tubercles in pairs. Petals 5. Stamens 10, the filaments united at the base. Ovary elongated; styles distinct. Capsules narrow, erect. [Greek, purple Oxalis.] Over 100 species natives of America. Type species: *Oxalis violacea* L.

Inflorescence simple; leaflets broadly obovate.

1. *I. intermedia*.

Inflorescence compound; leaflets orbicular or orbicular-obovate.

2. *I. Martiana*.

1. ***Ionoxalis intermedia*** (A. Rich.) Small, N. A. Fl. 25: 43. 1907.*Oxalis intermedia* A. Rich. Ess. Fl. Cub. 315. 1845.

Scape 1-3 dm. high, sparingly pubescent, slender, as long as the leaves or longer. Petioles sparingly pubescent; leaflets 3, obovate, 2-5 cm. wide, bright green and glabrous above, paler and somewhat pubescent beneath, 2-lobed; cymes 4-13-flowered; pedicels glabrous, 1-2 cm. long; sepals 4-5 mm. long, bearing 1 pair of apical tubercles; petals violet, 11-14 mm. long; shorter filaments slightly pubescent, the longer ones copiously pubescent. [*O. latifolia* of Millspaugh.]

Cultivated grounds, Porto Rico; St. Croix:—Florida; Bahamas; Cuba; Guadeloupe; Martinique.

2. ***Ionoxalis Martiana*** (Zucc.) Small, Fl. SE. U. S. 665. 1903.? *Oxalis corymbosa* DC. Prodr. 1: 696. 1824.*Oxalis Martiana* Zucc. Denks. Acad. Muench. 9: 144. 1825.

Scape 1.5-3 dm. high, pubescent, usually longer than the leaves. Petioles pubescent; leaflets 3, suborbicular or orbicular-obovate, 2.3-5.8 cm. wide, dark-green and usually with scattered hairs above, pale green and more or less pubescent beneath, 2-lobed; cymes compound, usually many-flowered; pedicels 1-3 cm. long, appressed-pubescent; sepals 4.5-6 mm. long, bearing 1 pair of thick apical tubercles; petals violet or rose-purple 11.8-15 mm. long; shorter filaments mostly glabrous, longer filaments pubescent, unappendaged. [*O. latifolia* of Urban.]

Waste and cultivated grounds, Porto Rico, locally a troublesome, although beautiful, weed; St. Croix; St. Thomas:—Florida; Bermuda; West Indies. Native of continental tropical America; introduced into the Old World tropics. VINAGRILLO MORADO.

2. **XANTHOXALIS** Small, Fl. SE. U. S. 666. 1903.

Caulescent, annual or perennial herbs, rarely shrubs, with alternate, long-petioled, 3-foliolate leaves, the leaflets sessile, notched or orbiculate, the yellow flowers in peduncled cymes. Sepals 5. Petals 5. Stamens 10, the filaments united into a tube at the base. Ovary oblong to linear; styles filiform or subulate. Capsule oblong or columnar, usually narrowed to the summit, erect. Seeds transversely ridged or tubercled. [Greek, yellow *Oxalis*.] About 50 species, widely distributed. Type species: *Oxalis corniculata* L.

1. ***Xanthoxalis corniculata*** (L.) Small, Fl. SE. U. S. 667. 1903.*Oxalis corniculata* L. Sp. Pl. 435. 1753.*Oxalis repens* Thunb. Oxal. 16. 1781.*Oxalis pilosiuscula* H. B. K. Nov. Gen. 5: 243. 1821.

Pubescent or nearly glabrous, annual or perennial, deep-green, freely branching from the base; stem 2.5-15 cm. long, the branches diffuse, mainly procumbent and often creeping. Leaflets 8-12 mm. wide; petioles dilated at the base into oblong, rounded or truncate stipules; peduncles 1-3-flowered; flowers 5-10 mm. wide; pedicels strigillose, more or less reflexed; capsule oblong, 1-1.8 cm. long, appressed-pubescent; seeds compressed, transversely ridged. [? *Oxalis Lyoni* of Krebs.]

River banks, slopes, waste and cultivated grounds at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola:—widely distributed in temperate and tropical regions of both hemispheres. VINAGRILLO. YELLOW WOOD SORREL.

Oxalis frutescens Bello, described from a plant observed without flower or fruit at Guanica, has not been further identified. [Not *Oxalis frutescens* L.]

Averrhoa Carambola L., CARAMBOLD, East Indian, of which a tree was seen at Loiza, Porto Rico, in 1915, and also recorded by Krebs as grown in St. Thomas prior to 1851, is a small tree with alternate odd-pinnate leaves, the 5-11 ovate, acute leaflets 2-7 cm. long, the small white flowers, with 5 stamens, in axillary panicles, the oblong acid berries sharply 5-angled, yellow; the seeds arillate.

Averrhoa Bilimbi L., BIMBLING, also East Indian, recorded by Krebs as formerly grown in St. Thomas and listed by Cook and Collins as grown in Porto Rico, is a similar tree, the flowers with 10 stamens, the fruit bluntly angled, the leaflets mostly lanceolate.

Pelargoniums, in various races, herbs of the related family **Geraniaceae**, are commonly grown for ornament in Porto Rico and the Virgin Islands under the garden name GERANIUM; most of them are hybrids between *P. zonale* and *P. inquinans*, their white to scarlet flowers often double.

Pelargonium peltatum (L.) Ait., IVY-LEAVED GERANIUM, South African, occasionally grown in flower gardens, is a trailing or straggling plant often 6 dm. long, the nearly orbicular peltate leaves 4-7 cm. broad, the red or white flowers few, on long peduncles.

Pelargonium ficifolium, listed by Krebs from St. Thomas, is probably a misprint of *P. fissifolium* Pers., a South African acaulescent plant with pinnatisect leaves.

Family 2. **ERYTHROXYLACEAE** A. Rich.

COCA FAMILY.

Glabrous trees or shrubs, with mostly alternate simple stipulate entire-margined petioled leaves and small, often heterostylous pedicelled flowers solitary or fasciated in the axils, the pedicels bracted at the base. Calyx persistent, mostly 5-cleft. Petals as many as the calyx-lobes, appendaged by a 2-lobed ligule within. Stamens 10, in 2 series, their filaments united below into a tube. Ovary 3-celled, rarely 4-celled; ovules 1, rarely 2, in each cavity, pendulous; styles 3, rarely 4; stigmas capitellate. Fruit a drupe, usually 1-celled and 1-seeded. Seed-coat thin, endosperm farinaceous; embryo straight. Only the following genus and the African *Anculophus*.

1. **ERYTHROXYLON** L. Syst. ed. 10, 1035. 1759.

Leaves alternate. Petals short-clawed. [Greek red-wood.] About 200 species of tropical and subtropical distribution, the Porto Rico ones known as JIBÁ. Type species: *Erythroxylon arcولاتum* L.

Leaves small, mostly not over 3 cm. long, the under surface scarcely areolate.

Leaves shining above, prominently reticulate-veined.

Leaves dull, not prominently reticulate-veined.

Petioles only 1-2 mm. long.

Petioles 2.5-5 mm. long.

Leaves larger, 5-13 cm. long, the under surface distinctly areolate.

1. *E. Urbani*.

2. *E. brevipes*.

3. *E. rotundifolium*.

4. *E. arcولاتum*.

1. **Erythroxylon Urbani** O. E. Schulz in Urban, Symb. Ant. 4: 314. 1905.

A shrub about 1 m. high. Leaves obovate, cuneate or acute at the base-rounded or emarginate at the apex, coriaceous, 2-3.5 cm. long, strongly reticulate, veined, bright green and shining above, pale green or glaucescent beneath; the

petioles 2.5–3.5 mm. long; stipules triangular, acute, 2-setulose at the apex, 3 mm. long or less; flowers solitary in the axils; pedicels about 1 mm. long; calyx about 1 mm. long, cleft to about the middle, its lobes ovate, acute; petals white, 2.5 mm. long, obtuse, the claw nearly as long as the blade, the ligule-lobes acute, one-third as long as the blade.

Wooded limestone hills near Manati, Porto Rico. Endemic.

2. **Erythroxyton brevipes** DC. Prodr. 1: 573. 1824.

A shrub or a small tree up to 5 m. high, much branched, many of the twigs short and rigid. Leaves obovate, 2.5 cm. long or less, subcoriaceous, dull or faintly shining above, pale beneath, rather inconspicuously reticulate-veined, the apex obtuse or emarginate, the base narrowed, the petioles 2 mm. long or less; stipules triangular-ovate, acute, about as long as the petioles; flowers 1–4 in the axils, white, about 5 mm. broad; pedicels 2–8 mm. long; calyx-lobes ovate, acute; petals oblong, the claw shorter than the blade, the ligule-lobes erose; drupe oblong, red, obtuse, 6–9 mm. long. [*E. obovatum* of Eggers, of Millspaugh and of Kuntze; *E. areolatum* of West, not of Linnaeus.]

Thickets, hillsides and arroyos at low elevations. Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; Virgin Gorda.—Cuba; Hispaniola; St. Martin; St. Barts; Guadeloupe. BRISSELET.

3. **Erythroxyton rotundifolium** Lunan, Hort. Jam. 2: 116. 1814.

Erythroxyton obovatum Macf. Fl. Jam. 1: 143. 1837.

Erythroxyton suave O. E. Schulz in Urban, Symb. Ant. 5: 197. 1907.

Erythroxyton suave ancurum O. E. Schulz, loc. cit. 199. 1907.

A shrub or a small tree up to 7 m. high, with slender flexible branches, the bark smooth. Leaves obovate to oblong-obovate or elliptic, firm in texture, 0.5–3 cm. long, obtuse or emarginate, dark green above, pale beneath, inconspicuously reticulate-veined, the petioles 2.5–5 mm. long; stipules ovate or ovate-lanceolate, acute or acuminate, 1–1.5 mm. long; flowers 1–4 in the axils; pedicels mostly as long as the petioles or longer; calyx cleft to about the middle, about 1 mm. long, its lobes triangular-ovate, acute; petals white, oblong, 1.5–2.5 mm. long, obtuse, the ligule about one-third as long as the blade, its lobes irregularly toothed; drupes oblong, red, obtuse, 4–6 mm. long. [*E. spinescens* of O. E. Schulz, not of Richard.]

Coastal thickets, dry southwestern districts of Porto Rico.—Bahamas; Jamaica; Cuba; Hispaniola. RAT-WOOD.

4. **Erythroxyton areolatum** L. Syst. ed. 10, 1035. 1759.

A shrub or a small tree up to 6 m. high. Leaves oblong to obovate, rather thin, 5–13 cm. long, 3–5.5 cm. wide, obtuse or emarginate at the apex, narrowed at the base, dark dull-green above, pale beneath and areolate by two lines parallel with the prominent midvein, the petioles 4–6 mm. long; stipules triangular, acute, about 2 mm. long; pedicels fascicled, as long as the petioles or shorter; flowers appearing with the leaves of the season, or before them, fragrant; calyx cleft to about the middle, nearly 2 mm. long, its triangular-ovate lobes acute; petals white or yellowish white, oblong, obtuse, 2–3 mm. long, the ligule about one-fourth as long as the blade; drupes red, oblong, 6–9 mm. long.

* Thickets and hillsides along the coast, dry southwestern districts of Porto Rico; Mona; doubtfully recorded from St. Thomas.—Bahamas; Jamaica; Cuba; Hispaniola; Colombia. FALSE COCAINE.

Erythroxyton obovatum Bello, described from a plant observed at Lares prior to 1881, requires further investigation and rediscovery; no specimens were preserved, apparently. [Not *E. obovatum* Macf.]

A barren specimen, apparently of a species of *Erythroxyton*, collected at Maricao (*Stevens 7885*) has broadly elliptic, obtuse or emarginate, coriaceous leaves 8–10 cm. long, 5–6 cm. wide.

Family 3. **BALSAMINACEAE** Lindl.

JEWEL-WEED FAMILY.

Annual or perennial succulent herbs, with alternate simple petioled leaves. Flowers showy, irregular. Sepals 3, rarely 5, imbricate, the posterior one petaloid, saccate, spurred. Petals 5, or 3 with 2 of them 2-cleft into dissimilar lobes. Stamens 5; filaments usually short, distinct; anthers short, thick, united around the stigmas. Ovary 5-celled; style short or none; stigma 5-toothed or 5-lobed; ovules 2—many in each cavity. Seeds pendulous, anatropous. Endosperm none; embryo nearly straight; cotyledons flat. Cleistogamous flowers, if present, smaller and more regular. The family consists of the following genus and the monotypic Asiatic genus *Hydrocera*.

1. **IMPATIENS** L. Sp. Pl. 937. 1753.

Characters of the family. [Name in allusion to the elastically bursting pods.] About 220 species, most abundant in tropical Asia.

1. **Impatiens Balsamina** L. Sp. Pl. 938. 1753.

Balsamina hortensis Desp. Dict. Sci. Nat. 3: 485. 1805.

Annual, the succulent stems 3–6 dm. high, more or less pubescent. Leaves lanceolate, 4–15 cm. long, sharply serrate, acute to acuminate at the apex, cuneate at the base; petioles short, glandular; flowers solitary or geminate in the axils of the leaves; pedicels 1–2 cm. long, puberulent; lateral sepals ovate, 2–3 mm. long, the posterior sepal rose or purple, broadly conic, 5–8 mm. deep, 10–15 mm. wide, with an arcuate spur 1–1.5 cm. long; anterior petal broadly obovate, 8–10 mm. long, the lateral and posterior ones obovate, 2–2.5 cm. long; capsule ovoid, villous, 15–20 mm. long, about 8 mm. wide.

Escaped from cultivation at middle elevations in Porto Rico. Commonly grown for ornament in Porto Rico and Virgin Island gardens, the petals mostly white. Escaped from gardens in the southeastern states and Jamaica. Native of southern Asia. GARDEN BALSAM. ESPUELO DE GALAN.

Impatiens Sultani Hook. f., RED BALSAM, from Zanzibar, a succulent herb 3–6 dm. high, with elliptic or lanceolate slender-petioled acute leaves 6 cm. or more long, the scarlet flowers solitary on axillary peduncles, is grown commonly in flower-gardens in Porto Rico, and the Virgin Islands. Races with white or pink flowers are sometimes found in cultivation.

Tropeolum majus L., JACINTO, GARDEN NASTURTIUM, South American, of the family **Tropeolaceae**, grown for ornament in Porto Rico and Virgin Island flower-gardens, is a weak, glabrous, succulent, spreading herb with stems about 3 dm. long, the long-petioled, peltate flaccid, nearly orbicular leaves 3–10 cm. in diameter; the showy irregular yellow to orange flowers are solitary on peduncles about as long as the petioles; the 5-lobed calyx is produced posteriorly into a spur 2–2.5 cm. long; the 5 petals are slightly unlike, 1.5–3 cm. long; there are 8 stamens with declined unequal filaments; the ovary is 3-celled and 3-lobed, the united styles filiform; the fleshy indehiscent white fruits are depressed-globose, 3-lobed, about 12 dm. broad, and are used for pickles.

Family 4. **ZYGOPHYLLACEAE** Lindl.

CALTROP FAMILY.

Herbs, shrubs, or some tropical species trees, the branches often jointed to the nodes. Leaves opposite or alternate, pinnate, digitate, or rarely simple, the leaflets entire. Stipules persistent. Flowers perfect, axillary, peduncled. Sepals usually 5, distinct, or united by their bases. Petals the same number as the sepals, or none. Stamens usually 8 or 10, inserted on the base of the receptacle, the alternate ones sometimes longer; anthers versatile, longitudinally dehiscent; filaments usually with a small scale at the base or near the middle. Ovary 4-12-celled; style terminal; stigma usually simple; ovules 1-numerous in each cavity, pendulous or ascending. Fruits various, dry or quite fleshy. About 20 genera and 160 species, widely distributed in warm and tropical regions.

Trees or shrubs; flowers blue or purple.

1. *Guaiacum*.

Herbs; flowers yellow.

Carpels spinose.

2. *Tribulus*.

Carpels tuberculate.

3. *Kallstroemia*.

1. **GUAIACUM** L. Sp. Pl. 381. 1753.

Evergreen trees or shrubs, with hard resinous wood, the branches stout, the nodes often swollen. Leaves opposite, petioled, abruptly pinnate, the leaflets 2-several pairs, entire, inequilateral, reticulate-veined, the stipules minute. Flowers clustered, peduncled, the peduncles subtended by minute deciduous bracts. Sepals 4 or 5, somewhat united at the base. Petals 4 or 5, blue or purple. Stamens 8 or 10; filaments filiform; anthers cordate or sagittate. Ovary stalked, 2-5-lobed, 2-5-celled; style subulate; ovules 8-10 in each cavity, anatropous. Fruit coriaceous, with 2-5 wing-like angles. Seeds ovoid or ellipsoid; embryo nearly straight. [From the aboriginal name.] About 8 species, natives of tropical and subtropical America. Type species: *Guaiacum officinale* L.

Petals tomentulose; fruit broadly obcordate; leaflets mostly 4.

1. *G. officinale*.

Petals glabrous; fruit broadly obovoid; leaflets mostly 6-10.

2. *G. sanctum*.

1. **Guaiacum officinale** L. Sp. Pl. 381. 1753.

A tree, up to 10 m. high, the bark smooth and gray, the branches flexuous. Leaves 3-9 cm. long; leaflets 4 or 6, mostly 4, oval to obovate, glabrous, 1-5 cm. long, rounded at the apex, sessile or nearly so, coriaceous at maturity; stipules 1 mm. long, pubescent, caducous; flowers few or many, terminal, the slender peduncles pubescent; sepals ovate to orbicular, 5-7 mm. long, tomentulose on both sides; petals blue, narrowly obovate, about 12 mm. long, tomentulose at the apex, rounded or mucronate; fruit usually 2-carpellary, broadly obcordate, yellowish, 17-20 mm. long; seeds ellipsoid, brown, 10-12 mm. long, 5-6 mm. broad, the aril cream-colored.

Woodlands, thickets, plains and hillsides at low elevations in the dry southern and southwestern districts of Porto Rico; Vieques; Culebra; St. Thomas; St. Croix; St. Jan; but nearly exterminated on the Virgin Islands, except where planted.—West Indies; continental tropical America. The yellowish brown, very hard and heavy wood is valued for rollers, hubs, cogs, and pulleys; it is strong and fine-grained, sinking in water, its specific gravity being about 1.25. The trunks of old trees reach about 5 dm. in diameter. GUAYACAN. LIGNUM VITAE.

2. **Guaiacum sanctum** L. Sp. Pl. 382. 1753.

A tree, sometimes 10 m. high, the bark pale, the branches spreading or pendulous. Leaves 4-10 cm. long; leaflets 4-10, oblong to obovate or oblanceolate, 2-3.5 cm. long, sessile, glabrous, coriaceous at maturity, usually apiculate

or mucronate; stipules about 3 mm. long, pubescent, usually caducous; flowers solitary or several, on pubescent peduncles shorter than the leaves; sepals obovate or oblong-obovate, 5-7 mm. long, pubescent; petals blue or purple, broadly obovate, 7-11 mm. long, glabrous, rounded at the apex; fruit broadly obovoid, yellow to orange, 14-17 mm. long; seeds ellipsoid, dark brown or black, 10-11 mm. long, 3-3.5 mm. broad, the aril scarlet.

Coastal hillsides and thickets, southwestern dry districts of Porto Rico; Mona-Florida; Bahamas; Cuba; Hispaniola; Yucatan. Its wood resembles that of the preceding species. GUAYACANCILLO. GUAYACAN BLANCO. LIGNUM VITAE.

2. **TRIBULUS** L. Sp. Pl. 386. 1753.

Herbs, with evenly pinnate leaves and peduncled axillary yellow flowers. Sepals 5, persistent. Petals 5, deciduous. Stamens 10, the alternate ones somewhat longer. Ovary sessile, 5-lobed, 5-celled, hairy, the hairs erect; style short; stigma 5-ridged; ovules 3-10 in each cavity, pendulous. Fruit 5-angled, spiny, splitting into 5, 3-5-seeded segments. [Greek, three-pronged, Caltrop, from the resemblance of the fruit to that implement.] About 12 species, of warm and tropical regions. Type species: *Tribulus terrestris* L.

1. **Tribulus cistoides** L. Sp. Pl. 387. 1753.

Tribulus terrestris cistoides Oliver, Fl. Trop. Afr. 1: 284. 1868.

Perennial; roots thick, woody; stems diffuse, procumbent, 3-10 dm. long, pubescent, becoming glabrate. Leaves 1-5 cm. long; leaflets 6-8 pairs, obliquely oblong or elliptic, acutish or obtuse and mucronulate, 4-15 mm. long, silky-pubescent beneath; stipules subulate, 5-8 mm. long; peduncles about as long as the leaves, solitary; sepals lanceolate, half as long as the petals; petals yellow, about 2 cm. long; carpels pilose, tubercled, each with 2 stout divergent spines and sometimes with several scattered smaller ones.

Naturalized on banks, San Juan and vicinity, and recorded as formerly found at Guanica, Porto Rico; St. Croix; St. Thomas (ex Krebs); Tortola; Virgin Gorda;—southeastern United States; West Indies, south to Martinique; continental tropical America and Old World tropics. LARGE YELLOW CALTROP. ÁBROJO.

3. **KALLSTROEMIA** Scop. Introd. 212. 1777.

Mostly annual pubescent herbs, with opposite stipulate, evenly pinnate leaves, and solitary axillary peduncled yellow flowers. Sepals 5 or 6. Petals 4-6, obovate or oblanceolate, deciduous. Stamens twice as many as the petals. Ovary sessile, 8-12-celled; ovule usually solitary in each cavity, pendulous; styles united, columnar, or subulate from a conic base; stigma capitate. Fruit vertically 8-12 angled, muricate, roughened, or tuberculate, separating into 8-12, indehiscent, 1- rarely 2-seeded nutlets. [In honor of Kallstroem.] About 20 species, widely distributed in warm and tropical regions. Type species: *Tribulus maximus* L.

Fruit glabrous; sepals lanceolate.
Fruit strigose; sepals linear-lanceolate.

1. *K. maxima*.
2. *K. caribaea*.

1. **Kallstroemia maxima** (L.) T. & G. Fl. N. A. 1: 213. 1838.

Tribulus maximus L. Sp. Pl. 386. 1753.

Branches slender, prostrate, 1.5-4.5 dm. or more long. Leaves short-petioled; stipules subulate; leaflets 3-4 pairs, oval or oblong, inequilateral, rounded or subcordate at the base, 5-20 mm. long; peduncles slender, 1.2-4 cm. long;

sepals lanceolate, acuminate, pubescent, persistent; petals light yellow, fading darker, obovate, 7–8 mm. long; fruit glabrous, the beak conic at the base, about as long as the body, 4–5 mm. long; carpels tuberculate and cross-ridged on the back, usually reticulate on the faces.

Fields, roadsides, banks and cultivated grounds, Porto Rico, at lower and middle elevations, mostly in dry districts; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—southeastern United States; West Indies; continental tropical America. **ABROJO. CALTROP.**

2. **Kallstroemia caribaea** Rydberg, N. A. Fl. 25: 111. 1910.

Branches diffuse or ascending 2.5–5.5 dm. long, hirsute. Leaves 1.5–5 cm. long; leaflets 2–4 pairs, obliquely elliptic or oval, 0.5–2.5 cm. long, 0.5–1.5 cm. broad; fruiting peduncles slender, 1.5–3 cm. long; sepals narrowly linear-lanceolate, hispid, 5 mm. long; petals yellow, obovate, 6–7 mm. long; fruit strigose; beak 4 mm. long, conic at the base, about equalling the carpels; nutlets tuberculate on the back and reticulate on the faces.

Sandy soil near Salinas, Porto Rico; St. Thomas; Tortola.—Lesser Antilles; Florida; Central America and northern South America.

Family 5. **MALPIGHIACEAE** Vent.

MALPIGHIA FAMILY.

Shrubs, trees or woody vines, mostly with opposite leaves, and perfect clustered, or sometimes solitary, nearly regular flowers. Calyx of 5, usually glandular sepals. Corolla of 5, usually clawed petals. Stamens 5 or 10; filaments united below, or distinct. Ovary sessile, mostly 3-carpellary; styles mostly distinct; stigmas minute. Fruit drupaceous, nut-like, capsular or a samara. About 60 genera, including over 700 species, natives of tropical and subtropical regions.

Fruit samaroid; woody vines.

Samaras 4-winged, the wings X-like, the two upper wings usually larger than the lower ones.

Samaras with a single dorsal wing, reduced to a crest in *Brachypteris*.

Stigmas clavate or truncate.

Stigmas on the ventral edge of the dilated style-tips.

Carpels crested, not winged.

Carpels winged.

Wing thickened on the lower margin.

Wing thickened on the upper margin.

Fruit a drupe, or a capsule; erect shrubs or trees.

Fruit a capsule.

Fruit a drupe.

Styles thick-tipped.

Styles distinct.

Styles united.

Styles subulate-tipped.

1. *Tetrapteris*.

2. *Banisteriopsis*.

3. *Brachypteris*.

4. *Banisteria*.

5. *Stigmaphyllon*.

6. *Thryallis*.

7. *Malpighia*.

8. *Bunchosia*.

9. *Byrsonima*.

1. **TETRAPTERIS** Cav. Diss. 433. 1790.

Woody climbers with much-branched stems. Leaves coriaceous or membranous, mostly entire, the stipules inconspicuous, deciduous. Inflorescence terminal. Calyx usually 8-glandular. Petals 5. Stamens 10, all antheriferous. Ovary 3-lobed. Styles 3, distinct. Samaras 1–3, crested on the back, each 4-winged, the wings X-like, the two upper wings usually larger than the lower ones. [Greek, referring to the four-winged samaras.] Over 60 species, natives of the West Indies and continental tropical America. Type species; *Tetrapteris inaequalis* Cav.

1. **Tetrapteris inaequalis** Cav. Diss. 433. 1790.

Banisteria bracteata DC. Prodr. 1: 590. 1824.

Tetrapteris paniculata Bello, Anal. Soc. Esp. Hist. Nat. 10: 245. 1881.

Stem up to 6 m. or more long. Leaves oblong-ovate to ovate, 6–16 cm. long, 2.3–8.3 cm. wide, acute or short-acuminate at the apex, usually rounded and often somewhat cordate at the base, glabrous, or with scattered hairs beneath, especially when young; sepals ovate or oblong-ovate, 3–4 mm. long, the glands about one half the length of the sepal-body; petals yellow, ovate to suborbicular, 6–7.5 mm. long; samaras 3–4 cm. long, pubescent, with a median ridge. [*T. citrifolia* of Urban, not of Persoon.]

Thickets, woodlands, river banks and arroyos, Porto Rico, at lower and middle elevations; Vieques; St. Thomas (according to Krebs); St. Croix (according to Niedenzu); —Hispaniola; Antigua to Tobago. BEJUCO DE PARALEJO. BEJUCO DE SOPLA.

2. **BANISTERIOPSIS** C. B. Robinson; Small, N. A. Fl. 25: 131. 1910.

Woody vines with slender, often much branched stems. Leaves opposite, often more or less coriaceous. Calyx 8- or 10-glandular, or glandless; sepals 5, persistent. Petals 5. Stamens 10, the filaments unequal. Ovary 3-lobed. Styles 3. Stigmas terminal. Samaras 1–3 together, each with a dorsal wing. [Resembling *Banisteria*.] Many species, natives of tropical America. Type species: *Banisteria brachiata* L.

1. **Banisteriopsis lucida** (Rich.) Small, N. A. Fl. 25: 133. 1910.

Banisteria lucida Rich. Ann. Soc. Hist. Nat. Paris 1: 109. 1792.

Stigmatophyllum nigrescens Kuntze, Rev. Gen. Pl. 89. 1891.

Leaves oblong-lanceolate to elliptic, or obovate, 5.5–16 cm. long, 2–5.5 cm. broad, acuminate at the apex, acute at the base, glabrous and lustrous above, often more or less ferruginous-pubescent beneath, short-petioled; sepals 2.5–3 mm. long; corolla about 2 cm. in diameter; petals yellow, the larger ones 11–13 mm. long; samara 4.5–5.5 cm. long.

Porto Rico, collected by Kuntze (according to Niedenzu); St. Vincent (according to Small); northern South America.

3. **BRACHYPTERYS** A. Juss. Ann. Sci. Nat. II. 13: 290. 1840.

Vines or small shrubs. Leaves opposite. Flowers solitary in the leaf-axils or borne in peduncled bracted umbel-like corymbs. Calyx 8-glandular, the sepals 5, persistent. Petals 5, yellow. Stamens 10, all antheriferous. Ovary 3-lobed. Styles 3, distinct. Samaras 2 or 3 together, or sometimes solitary, the body thick, the wings beak-like, flat. [Greek, short-winged.] About 2 species, natives of the West Indies and continental tropical America. Type species: *Stigmatophyllum paralias* A. Juss.

1. **Brachypterys ovata** (Cav.) Small, N. A. Fl. 25: 138. 1910.

Banisteria ovata Cav. Diss. 429. 1790.

Brachypterys borealis A. Juss. Ann. Sci. Nat. II. 13: 291. 1840.

Stigmatophyllum ovatum Ndz. Gen. Stigmat. 31. 1900.

A vine or weak shrub with slender branches. Leaves ovate to lanceolate, 3.5–12 cm. long, 2–5.5 cm. broad, acute or somewhat obtuse at the apex, usually rounded at the base, dark green and glabrous above, paler and often pubescent beneath, the petioles 0.7–1.5 cm. long; bracts ovate to orbicular-ovate, 1.5 cm. or more long; sepals ovate, 3.5–4 mm. long, the glands more than one half the length of the sepal-body; larger petals 11–13 mm. long; samaras 1.5–2 cm. long, the wing usually shorter than the body.

Coastal thickets, Porto Rico:—Cuba; Jamaica; Hispaniola; Guadeloupe to Trinidad; continental tropical America.

4. **BANISTERIA** L. Sp. Pl. 427. 1753.

[*HETEROPTERIS* H. B. K. Nov. Gen. & Sp. 5: 163. 1822.]

Woody vines, or sometimes shrubs or trees. Leaves opposite, coriaceous or membranous, with or without glands on the petioles. Flowers often small-borne in panicle, often leafy-bracted cymes. Calyx 8-glandular or glandless; the sepals persistent. Petals yellow, orange or purple. Stamens 10, all perfect; the filaments subulate. Ovary 3-lobed. Styles 3, distinct. Samaras 2 or 3 together, or solitary, the wing thickened along the dorsal side. [Commemorates John Banister, English missionary and naturalist, who collected plants in Jamaica and Virginia, and died about 1692.] About 80 species, natives of tropical America, a few in tropical Africa. Type species: *Banisteria brachiata* L.

Sepals with erect tips.

Petals purplish; mature leaves glabrous or nearly so beneath.

Petals yellow; mature leaves red-sericeous beneath.

Sepals with recurved tips; petals yellow; mature leaves glabrous or nearly so beneath.

1. *B. purpurea*.

2. *B. Wydleriana*.

3. *B. laurifolia*.

1. **Banisteria purpurea** L. Sp. Pl. 427. 1753.

Banisteria parvifolia Vent. Choix des Plantes pl. 51. 1803.

Heteropteris purpurea H. B. K. Nov. Gen. 5: 164. 1822.

Heteropteris parvifolia DC. Prodr. 1: 591. 1824.

Heteropteris purpurea antillana Ndz. Arb. Bot. Inst. Braunsberg 2: 15. 1903.

A rather slender vine, sometimes 5 m. or more long, the leaves elliptic to oval or suborbicular or ovate, 1–5 cm. long, 0.6–2.7 cm. broad, round or retuse and occasionally mucronate at the apex, usually rounded at the base, glabrous in age, short-petioled; branches of the inflorescence pubescent or glabrous; pedicels jointed below the middle; sepals elliptic or ovate, 2.5–3 mm. long, the glands more than one half the length of the sepal-body; petals purple, the larger ones up to 5.5 mm. long; samaras 2–3 cm. long, striate-veined, pubescent. [*B. microphylla* Sessé & Mocino, not Jacquin.]

Thickets, woodlands and arroyos at lower elevations, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Cuba; Hispaniola; St. Eustatius to Trinidad; northern South America. BULL WHITE.

2. **Banisteria Wydleriana** (A. Juss.) C. B. Robinson; Small, N. A. Fl. 25: 137 1910.

Heteropteris Wydleriana A. Juss. Ann. Sci. Nat. II. 13: 275. 1840.

Banisteria chrysophylla Bello, Anal. Soc. Esp. Hist. Nat. 10: 245. 1881.

Stigmaphyllon chrysophyllum Stahl, Estud. 2: 147. 1884.

Heteropteris Bellonis Urban, Symb. Ant. 1: 330. 1889.

Heteropteris chrysophylla Cook & Collins, Contr. U. S. Nat. Herb. 8: 159. 1903.

A slender vine, up to 10 m. long, or longer, the leaves ovate, oblong-ovate or oblong-elliptic, 4–10 cm. long, 2–7.3 cm. broad, acute, short-acuminate or obtuse at the apex, rounded or subcordate at the base, lustrous and reticulate-veined above, red-sericeous beneath, the petioles 6–10 mm. long, sepals ovate, 3–4 mm. long, the glands more than one half the length of the sepal-body; petals yellow; samaras 4.5–5.5 cm. long, the wing red-sericeous.

Thickets and river banks at lower and middle elevations, western districts of Porto Rico. Endemic. AHORCA CABALLO.

3. **Banisteria laurifolia** L. Sp. Pl. ed. 2, 611. 1762.

Banisteria pubiflora DC. Prodr. 1: 391. 1824.

Heteropteris laurifolia A. Juss. Ann. Sci. Nat. II. 13: 276. 1840.

Heteropteris pubiflora Bello, Anal. Soc. Esp. Hist. Nat. 10: 245. 1881.

Heteropteris laurifolia antillana Ndz. Arb. Bot. Inst. Braunsberg 2: 52. 1903.

A vine, sometimes 5 m. long, or shrub-like. Leaves oblong, elliptic, lanceolate or ovate, occasionally obovate, 5–15 cm. long, 2–9 cm. broad, acuminate at the apex, obtuse, rounded or acute at the base, reticulate-veined, pubescent with reddish-hairs when young, glabrous or nearly so except on the veins beneath at maturity; sepals oblong or lanceolate, 2.5–4 mm. long, sometimes glandless; petals yellow, the larger ones 5–7 mm. long, samaras 3.5–4 cm. long. [*B. lancifolia* of West.]

Thickets, woodlands, forests, river banks and arroyos, Porto Rico, ascending to higher elevations; St. Croix (according to Niedenzu):—Jamaica; Cuba; Hispaniola. Mexico and Central America. BEJUCO DE BUEY. PARALEJO VELLUDO.

5. **STIGMAPHYLLON** A. Juss. in A. St. Hil. Fl. Bras. Merid. 3: 48. 1833.

Woody vines, with opposite, coriaceous or membranous, petioled leaves, and bright yellow flowers, in axillary peduncled umbel-like corymbs. Receptacle pyramidal. Calyx 8-glandular; sepals persistent. Petals 5, their blades erose or fimbriate. Stamens 10, only 6 of them antheriferous; filaments unequal, united at the base or up to the middle; anthers short. Ovary 3-lobed; styles 3, distinct, unequal, sometimes foliaceous above. Samaras 2 or 3 together or solitary, with a flat dorsal wing. [Greek, leafy stigma.] About 50 species, natives of tropical America, in Porto Rico known as BEJUCO DE FARALEJO. Type species: *Banisteria auriculata* Cav.

Style-tips truncate or foot-like; leaves acute or rounded at the apex.

Anterior style very slender beaked, much shorter than the posterior ones.

Leaves of an ovate type, often cordate at the base, brownish in drying; primary veins usually distinct.

Leaves often of a linear, oblong, elliptic or oval type, usually not cordate at the base, silvery gray in drying; primary veins often not distinct.

Anterior style not slender beaked, slightly shorter than the posterior ones.

Leaves tomentose beneath, not reticulate-veined above; flower-stalk jointed near the base.

Leaves glabrous or nearly so at maturity, reticulate-veined above; flower-stalk jointed between the base and the middle.

Style-tips expanded, foliaceous; leaves acuminate.

1. *S. cordifolium*.

2. *S. ledifolium*.

3. *S. tomentosum*.

4. *S. linguatum*.

5. *S. puberum*.

1. **Stigmaphyllon cordifolium** Ndz. Gen. Stigmat. 1: 8. 1899.

A slender vine, the twigs and peduncles clothed with appressed-hairs. Leaves oblong-ovate to ovate or orbicular-ovate, 2.5–8 cm. long, 1.5–4.7 cm. broad, abruptly pointed or mucronate at the apex, rounded or cordate at the base; petioles 4–10 mm. long; sepals oval or suborbicular, 2.9–3.8 mm. long; larger petals 10.5–13 mm. long; samaras 1.7–2 cm. long, the ventral edge of the wing with an obliquely rounded auricle at the base.

St. Thomas, collected by Read (according to Niedenzu):—St. Kitts; Antigua; Montserrat; Guadeloupe; Dominica; Martinique; Trinidad.

2. **Stigmaphyllon ledifolium** (H. B. K.) Small, N. A. Flora 25: 141. 1910.

Banisteria ledifolia H. B. K. Nov. Gen. & Sp. 5: 159. 1822.

Banisteria diversifolia H. B. K. Nov. Gen. & Sp. 5: 159. 1822.

Stigmaphyllon diversifolium A. Juss. Ann. Sci. Nat. II. 13: 290. 1840.

A vine, sometimes 8 m. long. Leaves linear to oval or suborbicular, or occasionally somewhat obovate, 2-9 cm. long, 0.3-1.5 cm. broad, obtuse or acute at the apex, acute or rounded at the base, lustrous above and glabrous or nearly so in age, pubescent beneath or glabrous, short-petioled; peduncles and pedicels sparingly pubescent; sepals oval to suborbicular, 3-4 mm. long; larger petals 8-12.5 mm. long; samaras 2-2.5 cm. long.

Near Fajardo, Porto Rico. (*Sintenis 1130*), according to Niedenzu and to Urban:—Hispaniola (according to Niedenzu); Cuba.

3. **Stigmaphyllon tomentosum** (Desf.) Ndz. Gen. Stigmat. 1: 5. 1899.

Banisteria emarginata Cav. Diss. 425, in part. 1790.

? *Banisteria floribunda* DC. Prodr. 1: 589. 1824.

Banisteria tomentosa Desf.; DC. Prodr. 1: 589. 1824.

Stigmaphyllon emarginatum A. Juss. Ann. Sci. Nat. II. 13: 290, in part. 1840.

Stigmaphyllon floribundum Stahl, Estud. 2: 147. 1884.

Heteropteris nitida obtusifolia Kuntze, Rev. Gen. Pl. 88. 1891.

Banisteria rotundifolia Sessé & Moc. Fl. Mex. ed. 2, 116. 1894.

A vine 3-4 m. or more long, the young growth and twigs densely pubescent. Leaves ovate to oval or suborbicular, 5-15 cm. long, 3-11 cm. broad, round and often notched and mucronate at the apex, rounded or subcordate at the base, glabrous or pubescent above near the base, loosely tomentose beneath; peduncles and pedicels tomentose; sepals suborbicular or somewhat reniform, 2.5-3 mm. long; larger petals 10-12 mm. long; samaras 2.5 cm. long. [*Stigmaphyllon diversifolium* of Grisebach, in part, not of A. Juss; *Tetrapteris paniculata* of Stahl, not of Bello.]

Thickets, woodlands, forests and river banks at lower and middle elevations in Porto Rico; St. Thomas (ex Krebs); St. Jan; Virgin Gorda. Endemic.

4. **Stigmaphyllon lingulatum** (Poir.) Small, N. A. Fl. 25: 140. 1910.

Triopteris lingulata Poir. in Lam. Encycl. 8: 404. 1808.

Banisteria periptocifolia Desf.; DC. Prodr. 1: 589. 1824.

Stigmaphyllon periptocifolium A. Juss. Ann. Sci. Nat. II. 13: 290. 1840.

A vine, sometimes 4 m. or more long, the twigs strigose. Leaves narrowly to broadly ovate or oval, 2.5-10 cm. long, 1-6 cm. broad, occasionally larger, rounded and emarginate and often mucronate at the apex, rounded or cordate at the base, glabrous or nearly so at maturity, reticulate-veined; petioles 0.4-2 cm. long; sepals ovate to suborbicular, 3-4 mm. long; petals 10-13 cm. long; samaras 1.5-2 cm. long. [*S. Sagraeanum* and *S. diversifolium* of Millspaugh.]

Thickets, woodlands and hillsides, Porto Rico, at lower elevations; Mona; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Jamaica; Hispaniola; St. Martin to St. Lucia.

5. **Stigmaphyllon puberum** (L. C. Rich.) A. Juss. Ann. Sci. Nat. II. 13: 289. 1840.

Banisteria pubera L. C. Rich. Act. Soc. Hist. Nat. Paris 1: 109. 1792.

A vine with slender branches, the twigs, peduncles and petioles clothed with appressed brownish hairs. Leaves ovate, acuminate at the apex, rounded or truncate at the base, glabrous or nearly so above, appressed-pubescent beneath; petioles 1.5-4 cm. long; sepals ovate, 3-3.5 mm. long; larger petals 9-11 mm. long, the margin fringed; samaras 2.5-3 cm. long, the ventral edge of the wing scarcely auricled, the dorsal edge decurrent on the samara body.

Eastern Porto Rico, collected by Schwanecke (according to Urban):—Cuba; Jamaica; Hispaniola; Guadeloupe to Trinidad; Panama; South America.

Stigmaphyllon ciliatum (Lam.) A. Juss. recorded by Niedenzu as collected on St. Thomas by Finlay was really from Trinidad. [*Banisteria ciliata* Lam.]

6. **THRYALLIS** L. Sp. Pl. ed. 2, 554. 1762.[*GALPHIMIA* Cav. Ic. 5: 61. 1799.]

Shrubs, the leaves opposite, entire, petioled or sessile, with a marginal gland on each side near the base, or on the upper part of the petiole. Flowers in simple or branched raceme-like panicles. Calyx 5-cleft, without glands, or rarely with small glands. Petals yellow. Stamens 10, all antheriferous. Ovary 3-lobed; styles 3, distinct. Stigmas minute. Capsule 3-lobed; epicarp slightly fleshy; endocarp hard and brittle; embryo bent round a fold of the seed coat; cotyledons incumbent; radicle rather long. [Greek name for a kind of mullein.] About 15 species, natives of continental tropical America. Type species: *Thryallis brasiliensis* L.

1. **Thryallis glauca** (Cav.) Kuntze, Rev. Gen. Pl. 89. 1891.*Galphimia glauca* Cav. Ic. 5: 61. 1799.*Galphimia gracilis* Bartl. Linnaea 13: 552. 1839.*Thryallis gracilis* Kuntze, Rev. Gen. Pl. 89. 1891.

A small or medium sized shrub with much-branched stems. Leaves ovate, oblong or oval, 1-7 cm. long, 0.5-4 cm. broad, obtuse or acute at the apex, often acutish at the base, membranous, glaucous, especially beneath, glabrous; panicles usually many-flowered, the rachis pubescent or glabrous; sepals oblong, 3.5-4.5 mm. long; larger petals 7-12 mm. long; capsule 3.5-4.5 mm. long; seeds dark brown, 3-3.5 mm. long.

Occasionally spontaneous after cultivation and naturalized in Porto Rico; St. Croix; St. Thomas; commonly planted for ornament in Porto Rico and Virgin Island gardens:—widely grown and locally spontaneous in Florida, the West Indies and continental tropical America. Native of Mexico. LLUVIA DE ORO. CONSULITA. GALPHIMIA. RESEDA.

7. **MALPIGHIA** L. Sp. Pl. 425. 1753.

Shrubs or small trees, with opposite leaves usually bearing stinging hairs beneath, the white pink or red flowers in axillary peduncled cymes. Calyx 6-10-glandular, persistent. Petals 5, the blades undulate or fimbriate. Stamens 10, all antheriferous; filaments united to the middle or below; anthers short, often didymous. Ovary glabrous, 3-lobed; styles distinct; stigmas small. Fruit a fleshy drupe, usually depressed-globose. [In honor of Marcello Malpighi, 1628-1693, Italian botanist.] Over 30 species, of tropical and subtropical America. Type species: *Malpighia glabra* L.

Leaves entire.

Leaves elliptic or lanceolate to ovate, oval or suborbicular.

Mature leaves glabrous.

Umbels sessile or subsessile; styles unequal; leaves obtuse or rounded and often emarginate.

Leaves 2-7 cm. long; fruit 1-1.6 cm. in diameter.

Leaves 5-9 cm. long; fruit about 2 cm. in diameter.

Umbels peduncled; styles nearly equal; leaves usually acute or acuminate.

Mature leaves with two-branched stinging hairs beneath.

Leaves acute or rounded at the base, the margin sometimes furnished with parallel bristles.

Inflorescence peduncled, few-flowered.

Stamens opposite the lateral petals not longer than those opposite the sepals; styles swollen at the apex.

Stamens opposite the lateral petals longer than those opposite the sepals; styles hooked at the apex.

Inflorescence fascicled, many-flowered.

Leaves cordate at the base, the margin bristly ciliate.

Leaves linear, armed with stinging hairs.

Leaves sinuate-dentate, the teeth armed with bristles, or sometimes individually entire on some of the branches.

1. *M. puniceifolia*.2. *M. Thompsonii*.3. *M. glabra*.4. *M. fucata*.5. *M. pallens*.6. *M. Shaferi*.7. *M. infestissima*.8. *M. linearis*.9. *M. coccigera*.

1. *Malpighia puniceifolia* L. Sp. Pl. ed. 2, 609. 1762.

M. puniceifolia lancifolia Ndz. Gen. Malp. S. 1899.

M. puniceifolia vulgaris Ndz. Gen. Malp. S. 1899.

M. puniceifolia obovata Ndz. Gen. Malp. S. 1899.

A shrub or small tree. Leaves elliptic, oblong, or obovate or narrowly oblanceolate, 2-7 cm. long, 0.8-4 cm. broad, obtuse or rounded and often emarginate at the apex, acute or cuneate at the base, glabrous when mature, the petioles 1.5-4 mm. long; cymes sessile or short-peduncled, the branches usually pubescent; sepals ovate, 2.8-3 mm. long, pubescent; petals pink or violet, the larger ones up to 9 mm. long; drupes globose, ovoid or subglobose, 1-1.6 cm. in diameter, scarlet. [*M. glabra* of Millspaugh, not of Linnaeus.]

Occasionally spontaneous after cultivation in Porto Rico for its fruit; St. Croix; St. Thomas;—St. Martin to Trinidad, Margarita and Curaçao, northern South America. CEREZA COLORADA. WEST INDIAN CHERRY. CHEREESE.

2. *Malpighia Thompsoni* Britton and Small, sp. nov.

A shrub 2.5 m. tall or less, the foliage glabrous, except the young twigs and unfolding leaves, the bark gray. Leaves oval or elliptic, varying to slightly broadest above the middle or below it, 5-9 cm. long, usually rounded at the minutely pointed or notched apex, deep green above, paler beneath with the midrib prominent, very short-petioled; cymes sessile or nearly so, the branches 1-2 cm. long, sparingly pubescent, several-flowered; bractlets minute; flowers short-pedicelled; sepals broadly ovate, about 3 mm. long, obtuse, sparingly pubescent; glands oval, more than half as long as the sepal; petals above 8 mm. long, the claw and the blade nearly equal in length; androecium nearly 3 mm. long, the free part of the filaments stout-subulate, as long as the tube or slightly longer; anthers ellipsoid, nearly 1.5 mm. long; ovary ovoid; styles 3, stout, obliquely dilated at the apex; drupe about 2 cm. in diameter; stones orbicular-ovate, about 1.5 cm. long, with thin edges and three dorsal crests, the umbal one finely toothed, the lateral ones lobed.

Rust-up-Twist, St. Croix, *J. B. Thompson*, September 1st, 1923, 283, in flower; December 2, 1923, 578, in fruit. Related to *M. puniceifolia* L. but larger in all its parts. The leaf-blades are almost uniformly broad at the base. The cymes are more copiously flowered and the pedicels shorter; the sepals are broader, the filaments and styles stouter, and the fruit larger.

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

Malpighia glabra antillana Urban & Ndz.; Ndz. Gen. Malp. 5. 1899.

A shrub 1.5-3 m. tall, or a small tree. Leaves elliptic, elliptic-lanceolate or ovate, 3-9 cm. long, 0.7-3.5 cm. broad, acute to acuminate, rarely obtuse at the apex, acute at the base, glabrous when mature, the petioles 1-2 mm. long; cymes peduncled, the branches appressed-pubescent or glabrous; sepals oblong to ovate-oblong, 2.5-3 mm. long, glabrous or pubescent on the back; petals pink, the larger ones 6-7.5 mm. long; drupes depressed-ovoid, 0.8-1 cm. in diameter, scarlet.

Thickets, St. Croix; St. Thomas;—West Indies; southern Texas; continental tropical America.

4. *Malpighia fucata* Ker, Bot. Reg. under *pl.* 189. 1817.

Malpighia macrophylla Desf. Cat. Hort. Par. ed. 3, 232. 1829.

Malpighia fucata macrophylla Ndz. Gen. Malp. 11. 1899.

Malpighia fucata longifolia Ndz. Gen. Malp. 11. 1899.

Malpighia fucata elliptica Ndz. Gen. Malp. 11. 1899.

Shrub or small tree. Leaves oblong, elliptic, lanceolate or occasionally ovate or obovate, 6-20 cm. long, 2-12 cm. broad, acute or obtuse at both ends, deep green and glabrous above, paler and hispid beneath with two-branched

hairs, the petioles 5–10 mm. long; cymes peduncled, the branches sparingly pubescent; sepals ovate or oval, 2.5–3 mm. long; petals whitish or pink, the larger ones 6–11 mm. long; drupes subglobose, 12–15 mm. in diameter. [*M. urens* Bello, not of Linnaeus.]

Thickets and woodlands at lower and middle elevations, Porto Rico; Vieques (according to Urban); St. Thomas (according to Krebs); St. Croix (according to Eggers);—Jamaica. OLAGA. PALO BRONCO.

5. *Malpighia pallens* Small, N. A. Fl. 25: 157. 1910.

A shrub about 2 m. high or a small tree with brownish bark. Leaves oblong or elliptic, or somewhat obovate, 3.5–8 cm. long, 1.5–4 cm. broad, rounded or acutish at both ends, light green and glabrous above, scarcely paler beneath with few or many persistent hairs, short-petioled; cymes peduncled; sepals ovate, 2–2.5 mm. long; drupes subglobose, 14–16 mm. in diameter, red. [*M. urens* of Millspaugh ? and of Eggers.]

Coastal thickets, St. Croix. Endemic. The leaves are usually copiously armed beneath with long yellowish stinging hairs and contact with them is highly irritating.

6. *Malpighia Shaferi* Britton and Wilson, Bull. Torr. Club 43: 456. 1916.

A shrub 2–2.5 m. tall, with grayish-brown twigs. Leaves oblong-elliptic to elliptic or somewhat oblong-lanceolate, 13–17 cm. long, 4.5–8.5 cm. broad, acute, or rounded and mucronate, or occasionally retuse at the apex, rounded or acute at the base, reticulate-veined above, armed beneath with closely-appressed stinging hairs, the margin revolute; petioles stout, 8–12 mm. long; cymes sessile; sepals elliptic to broadly ovate, 2–3 mm. long, 1.2–1.5 mm. broad; petals pink, the larger ones 10–11 mm. long; drupes red.

Ravines, Vieques. Endemic.

7. *Malpighia infestissima* (A. Juss.) Rich.; Ndz. Gen. Malp. 15. 1899.

M. urens infestissima A. Juss. in Walp. Repert. 5: 151. 1845.

A shrub 2 m. high, or sometimes a small tree. Leaves ovate to oval, 4–12 cm. long, 2–8.5 cm. broad, rounded and sometimes retuse at the apex, or acute, rounded or cordate at the base, often more or less bristly hispid on both surfaces, short-petioled or subsessile; cymes peduncled; sepals oblong to oval-oblong, 3–3.5 mm. long; petals white or pink, the larger ones 9–13 mm. long; drupes ovoid, 11–16 mm. in diameter. [*M. urens* of West and of Krebs, not of Linnaeus; *M. Cnide* of Eggers, not of Sprengel.]

Hillsides and coastal thickets, Culebra; Vieques; Water Island, St. Thomas; St. Jan; Virgin Gorda; Anegada; St. Thomas is the type locality. Endemic. COWHAGE CHERRY.

8. *Malpighia linearis* Jacq. Enum. 21. 1760.

Malpighia angustifolia L. Sp. Pl. ed. 2, 610. 1762.

Malpighia angustifolia oblongata Ndz. Gen. Malp. 9. 1899.

Malpighia angustifolia linearis Ndz. Gen. Malp. 9. 1899

A shrub 2.5–3 m. high, or a small tree. Leaves linear or linear-oblong, 4–10.5 cm. long, 2.5–15 mm. broad, abruptly acute or short-acuminate at the apex, acutish at the base, glabrous above, hispid beneath with two-branched hairs, the petioles 1–3 mm. long; cymes peduncled, the branches pubescent; sepals lanceolate, 2.5–3 mm. long, pubescent; petals white or purplish, the larger ones 6–8 mm. long; drupes globose-ovoid, 8–11 mm. in diameter, red. [? *M. urens lanceolata* of Eggers.]

Thickets, Vieques (according to Eggers); Water Island, St. Thomas; St. Jan; Anegada;—St. Martin to Montserrat. STINGING BUSH.

9. *Malpighia coccigera* L. Sp. Pl. 426. 1753.*Malpighia coccigrya* L. Sp. Pl. ed. 2, 611. 1762.*Malpighia coccigera coccigrya* Ndz. Gen. Malp. 19. 1899.

A shrub 1 m. high or less. Leaves oval, suborbicular, ovate or obovate in outline, 0.5-3.7 cm. long, 0.4-3.4 cm. broad, obtuse or rounded and sometimes emarginate at the apex, rounded or broadly cuneate at the base, prominently sinuate-dentate, the teeth armed with bristles, or sometimes entire, lustrous and veiny above, dull beneath, glabrous at maturity; the petioles 1 mm. long or less; cymes short-peduncled; sepals oblong or ovate-oblong, 3-3.5 mm. long; petals pink, the larger ones 9-10 mm. long; drupes subglobose, 9-10 mm. in diameter.

Thickets, woodlands and forests, Porto Rico, at lower and middle elevations in wet or moist districts:—Cuba; Hispaniola; Martinique to St. Lucia. Occasionally grown for ornament and interest in Porto Rico gardens. Recorded by Krebs from St. Thomas. AZOTA CABALLO.

Malpighia oxycocca corymbosa, forma *Grisebachiana* Ndz., recorded by Niedenzu as collected by Eggers on St. Croix, is known to us from description only. It may be referable to one of the preceding species.

Malpighia setosa Spreng., a species endemic in Hispaniola, was recorded by Krebs from St. Thomas, in error.

A shrub on Maguey Island near Parguera, southwestern coast of Porto Rico, with very short-petioled, stellate-puberulent, ovate thin entire leaves, 4-6 cm. long, the apex obtuse or acutish, the base cordate, the upper surface bright green, the under surface pale green, with long scattered 2-orked stinging hairs, is probably another species of *Malpighia*; the shrub was barren at the time of our visit to this island on Feb. 24, 1924 (*Britton, 8059*).

8. *BUNCHOSIA* Rich.; A. Juss. Ann. Mus. Paris 18: 481. 1811.

Shrubs or trees, with opposite, usually coriaceous, petioled or nearly sessile leaves, and yellow or white flowers in terminal panicles. Calyx 8-10-glandular, the 5 sepals persistent. Petals 5, their broad blades undulate or toothed. Stamens 10, all antheriferous; filaments partly united, glabrous; anthers short. Ovary 2-3-lobed; styles united; stigma 3-lobed or capitate. Drupe ovoid, globose or reniform. [Said to be derived from an Arabic name for coffee.] Thirty species or more, of tropical and subtropical America. Type species: *Malpighia odorata* Jacq.

Ovary and style glabrous.

Drupes usually less than 1 cm. in diameter; leaves 1-3.5 cm.

broad.

Drupes usually over 1 cm. in diameter; leaves 2-7 cm. broad.

Ovary and style pubescent.

1. *B. glandulosa*.2. *B. nitida*.3. *B. glandulifera*.1. *Bunchosia glandulosa* (Cav.) DC. Prodr. 1: 581. 1824.*Malpighia glandulosa* Cav. Diss. 8: 411. 1789.*Bunchosia glandulosa latifolia* Ndz. Gen. Bunch. 11. 1898.

A shrub, or sometimes a tree up to 8 m. high. Leaves oblong to oblanceolate or elliptic-obovate, glabrous, 3-11 cm. long, 1-3.5 cm. broad, obtuse or acute at the apex, narrowed or acute at the base, bright green, somewhat paler beneath than above, the petioles 5-12 m. long; panicles often many, as long as the leaves or shorter; pedicels finely pubescent when young, becoming glabrous; sepals oblong or ovate-oblong, about 3 mm. long; petals yellow, the larger 6-7.5 mm. long, with suborbicular, erose or denticulate blades; ovary and style glabrous; drupes ovoid, red or orange, 2-lobed, 8-10 mm. in diameter. [*Malpighia Swartziana* of Eggers; ? *Bunchosia media* of Krebs.]

Coastal woodlands and thickets, and on hillsides near the coasts. Porto Rico; Icosos; St. Croix; St. Thomas; St. Jan; Tortola.—Bahamas; Hispaniola; St. Barts to Martinique; Yucatan.

2. **Bunchosia nitida** (Jacq.) DC. Prodr. 1: 582. 1824.

Malpighia nitida Jacq. Enum. 21. 1760.

Bunchosia polystachya DC. Prodr. 1: 581. 1824.

A shrub or tree. Leaves elliptic-oblong, elliptic or somewhat lanceolate, 4–16 cm. long, 2–7 cm. broad, acute to acuminate, or occasionally obtuse and emarginate at the apex, acute or obtuse at the base, glabrous in age, short-petioled; panicles equalling or shorter than the leaves; pedicels pubescent; sepals oblong to ovate; 4–5 mm. long; larger petals suborbicular, 6.5–8 mm. long, glandular-toothed; ovary and style glabrous; drupes yellow, 2-lobed, 14–16 mm. in diameter.

Woodlands near Guanica and near Mayaguez (according to Urban, determined from barren specimens).—Hispaniola; Montserrat to Grenada and Barbados. Recorded by Krebs from St. Thomas.

3. **Bunchosia glandulifera** (Jacq.) H. B. K. Nov. Gen. 5: 154. 1822.

Malpighia glandulifera Jacq. Coll. 4: 207. 1790.

A small tree. Leaves ovate to oval, 5–17 cm. long, 3–10.5 cm. broad, acute to acuminate at the apex, obtuse or rounded at the base, glabrous above, sparsely pubescent beneath, the petioles 0.7–1 cm. long, often bearing two or more elevated glands near the top; panicles shorter than the leaves; pedicels pubescent; sepals ovate-oblong, 3.5–4.5 mm. long; larger petals 7–8 mm. long; ovary and style pubescent; drupes 2-lobed, 10–14 mm. in diameter, red.

Forests, Sierra de Yabucoa.—Montserrat; Guadeloupe; Martinique; Trinidad (?); Venezuela. CAFÉ FORASTERO.

9. **BYRSONIMA** Rich.; A. Juss. Ann. Mus. Paris 18: 491. 1811.

Shrubs or trees, with opposite, petioled or sessile leaves, the flowers in terminal panicles or racemes. Calyx 10-glandular, or glandless, of 5 broad persistent sepals. Petals 5, the blades suborbicular to reniform. Stamens 10, all antheriferous; filaments short, slightly united at the base. Ovary 3-lobed; styles 3, slender; stigmas subulate. Drupes ovoid to globose. [Greek, tanning.] About 100 species, of tropical and subtropical America. Type species: *Malpighia spicata* Cav.

Leaves small, spatulate to obovate, 1.5–9 cm. long, 0.9–4.5 cm. broad.

Panicles 2–6 cm. long; larger petals 5–7 mm. long; petioles 2–5 mm. long.

Petals white to red; leaves 6 cm. long or less.

Petals light yellow; leaves 4–9 cm. long.

Panicles 5–9 cm. long; larger petals 8–10 mm. long; petioles 5–9 mm. long; leaves 6 cm. long or less.

Leaves various, averaging much larger.

Bracts 3 mm. long or less, silky on both sides; leaves often pubescent beneath, especially along the margin, with rusty or grayish strigose hairs.

Bracts over 3 mm. long, tomentose beneath, glabrous or nearly so above; leaves often pubescent, especially along the midvein, with rusty curly hairs.

1. *B. cuneata*.

2. *B. Horneana*.

3. *B. ophiticola*.

4. *B. spicata*.

5. *B. crassifolia*.

1. **Byrsonima cuneata** (Turcz.) P. Wilson, Bull. N. Y. Bot. Gard. 8: 394. 1917.

Malpighia lucida Sw. Prodr. 74. 1788. Not Miller. 1768.

Byrsonima lucida DC. Prodr. 1: 580. 1824.

Malpighia cuneata Turcz. Bull. Soc. Imp. Nat. Mosc. 31: 390. 1858.

Byrsonima portoricensis Stahl, Estud. 2: 143. 1884.

A shrub, 2.5 m. high or less, sometimes a small tree up to 8 m. high, the twigs slender, mostly short. Leaves spatulate to obovate, rather thin in texture, flat, 1.5–5.5 cm. long, glabrous, rounded or abruptly acute at the apex, narrowed or cuneate at the base, lustrous above, dull beneath, the petioles 2–5 mm. long; pedicels sparingly pubescent or glabrous; sepals ovate or oblong, about 3 mm. long; petals white to red, the larger 5–7 mm. long; drupes globose, brown, 9–12 mm. in diameter.

Thickets, woodlands and hillsides at lower elevations, Porto Rico; Mona; Vieques; St. Thomas (according to de Candolle and listed by Krebs); Anegada:—Florida; Bahamas; Cuba; Hispaniola; Barbuda to Barbados. The dark brown wood, used for furniture, is heavy, fine-grained, hard and strong. PALO DE DONCELLA. GUANO-BERRY. CANDLE-BERRY.

2. **Byrsonima Horneana** Britton & Small, sp. nov.

A tree 5 m. tall or less, the twigs with red tomentum which ultimately turns gray. Leaves obovate to elliptic, 4–9 cm. long, 1.5–4.5 cm. broad, abruptly pointed, acute, sometimes cuneate at the base, glabrous, or with scattered hairs on and about the midrib on both sides; sepals ovate, 3–3.5 mm. long, the glands about half as long as the sepal-body; petals light yellow, or fading reddish, the larger 6–7 mm. long; drupe globose, 10–12 mm. in diameter.

Thickets, Guanajibo, Porto Rico (*Britton 8034*, type); collected also by Mrs. Frances W. Horne. Endemic.

3. **Byrsonima ophiticola** Small, Bull. Torr. Bot. Club **43**: 456. 1916.

A tree, 8 m. tall or taller, with grayish branches, the young twigs clothed with a reddish-brown tomentum. Leaves clustered at the ends of the branches, obovate, 2–6.5 cm. long, 0.9–2.2 cm. broad, rounded or sometimes acutish at the apex, cuneate or acute at the base, pubescent on both sides when young, the hairs sometimes persisting in age; petioles 5–9 mm. long, pubescent with reddish hairs; inflorescence 5–9 cm. long; pedicels 5–10 mm. long, pubescent; sepals ovate, 2.5–3 mm. long, obtuse or acutish; petals 8–10 mm. long, yellow, turning scarlet.

Serpentine slopes, Guanajibo, near Mayaguez. Endemic.

4. **Byrsonima spicata** (Cav.) DC. Prodr. **1**: 580. 1824.

Malpighia spicata Cav. Diss. **8**: 409. 1790.

A tree, sometimes 25 m. high, the young twigs clothed with reddish tomentum. Leaves elliptic, oblong or somewhat lanceolate, 6–13 cm. or more long, 1.5–5 cm. broad, acutish, acuminate, or obtuse at the apex, acute at the base, pubescent when young, glabrous or nearly so when mature; sepals ovate, 2.5–3 mm. long; under petals 5–6 mm. long; drupes globose, 9–11 mm. in diameter. [*Malpighia undulata* Sessé & Moçino, not A. Juss.; *Byrsonima coriacea* of Millspaugh, not of de Candolle.]

Woods and forests at lower and middle elevations in wet and moist districts, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola:—Cuba; Hispaniola; continental tropical America. The record by Small of the species *B. martinicensis* Krug & Urban from St. Croix, applies to this tree. Occasionally planted in Porto Rico. Its wood is reddish brown; hard, strong and heavy, valued for furniture and for construction; the astringent bark is sometimes used in tanning. Its trunk reaches 3 dm. in diameter or more, with smooth gray bark. MARICAO.

5. **Byrsonima crassifolia** (L.) H. B. K. Nov. Gen. **5**: 149. 1822.

Malpighia crassifolia L. Sp. Pl. 426. 1753.

Byrson ma cubensis A. Juss. Ann. Sci. Nat. **11**: 333. 1840.

Byrsonima crassifolia typica Ndz. Gen. Byrs. **2**: 16. 1901.

A tree or shrub, the twigs clothed with reddish tomentum. Leaves oblong-elliptic, ovate, lanceolate, narrowly oblong or obovate, 5–17 cm. long, 2–12 cm. broad, acute, acuminate or obtuse at the apex, acute or rounded at the base, glab-

rous or nearly so above when mature, rusty pubescent beneath, or glabrous, short-petioled; pedicels red-tomentose; sepals ovate, 3.5–4.5 mm. long, petals yellow, the larger ones 7–10 mm. long; drupes globose, 9–12 mm. in diameter.

Slopes, northwestern and western districts of Porto Rico;—Jamaica; Cuba; Hispaniola; Dominica; Barbados; Trinidad; northern South America. MARICAO CIMARRON.

Byrsonima coriacea (Sw.) DC., endemic in Jamaica, was recorded from St. Thomas by Krebs, evidently in error; Krebs gives for it the English name Locust-berry Tree. [*Malpighia coriacea* Sw.]

Byrsonima laevigata DC., of Guiana, was also recorded by Krebs from St. Thomas.

Spachea littoralis A. Juss., described by A. Jussieu as from St. Thomas, collected by Finlay, was really collected in Trinidad.

Hiraea faginea (Sw.) Ndz., recorded by Niedenzu from St. Thomas, is probably an error in locality.

Triopteris jamaicensis L. (*T. rigida* Sw.) of the Bahamas, Cuba and Hispaniola, is mentioned by Stahl in his Flora of Porto Rico, with the explanation, however, that he had not seen a specimen. It probably does not occur within our area, although it was also recorded by Krebs as found in St. Thomas prior to 1851.

Family 6. **RUTACEAE** Juss.

RUE FAMILY.

Aromatic trees or shrubs, often armed with prickles, rarely herbs, with heavy-scented and glandular-punctate foliage, pinnately or digitately compound, unifoliolate, or simple leaves, and perfect or polygamo-dioecious flowers. Sepals 4 or 5, or none. Petals 4 or 5, hypogynous or perigynous. Stamens of the same number, or twice as many or sometimes more, distinct, inserted on the receptacle; anthers 2-celled, mostly versatile. Disk annular. Carpels 1–5, or more, sessile or stipitate, free or united. Fruit various, a capsule, berry or follicle. Seeds oblong or reniform; endosperm generally fleshy, sometimes none. About 110 genera and 950 species, most abundant in South Africa and Australia.

Fruit dry, a follicle or capsule.

Corolla gamopetalous; filaments adnate to the corolla-tube.

Corolla polypetalous; filaments free from the petals.

Stamens as many as the petals; ovules 1 or 2 in each carpel.

Flowers dioecious or polygamous; disk inconspicuous.

Flowers perfect; ovary immersed in a fleshy disk.

Stamens twice as many as the petals; ovules 5 or more in each carpel; herbs.

Fruit fleshy, a drupe or berry.

Fruit a drupe; style persistent.

Fruit a berry; style deciduous; ovary several-celled.

Stamens 6–10.

Stamens 6; calyx 3-lobed; leaves trifoliolate.

Stamens 8 or 10; calyx 5-fid or 5-parted; leaves odd-pinnate.

Stamens numerous; carpels several-seeded; leaves unifoliolate.

1. *Ravenia*.

2. *Zanthoxylum*.

3. *Pilocarpus*.

4. *Ruta*.

5. *Amyris*.

6. *Triphasia*.

7. *Chalcas*.

8. *Citrus*.

1. **RAVENIA** Vell. Fl. Flum. 20. 1825.

Shrubs or trees, with opposite, simple or compound, entire leaves. Inflorescence terminal and axillary, few-flowered. Flowers perfect, showy. Sepals 4 or 5, imbricate, unequal, the two outer larger than the inner ones. Corolla funnel-shaped, the lobes 4 or 5, unequal. Stamens 4 or 5, the two inferior fertile,

the superior ones sterile; filaments aduate to the tube of the corolla, the tips of the sterile ones free, linear or subulate; anthers longitudinally dehiscent. Ovary 4- or 5-lobed, 4- or 5-celled, immersed in the cup-shaped disk; style filiform, stigma 4- or 5-lobed. Ovules 2 in each cell. Fruit composed of 1-5, 2-valved carpels. Seeds 1 or 2 in each carpel; embryo curved; cotyledons 2-lobed, conduplicate. [In honor of Jean François Raven, a French physician, who collected rare plants in South America, died in Africa.] About 6 species, natives of the West Indies and South America. Type species: *Ravenia infelix* Vell.

1. **Ravenia Urbani** Engler; Urban, Bot. Jahrb. 21: 552. 1896.

A tree, sometimes 16 m. high. Leaves simple, elliptic to suborbicular or ovate, 5-15 cm. long, 3.5-8.5 cm. broad, rounded, obtuse, retuse, acute, or acuminate at the apex, rounded and slightly cordate at the base, dark green above, paler beneath, glabrous, coriaceous, glandular-punctate, short-petioled or sessile; inflorescence 3-7-flowered; pedicels short; outer sepals linear or oblong-linear, 6-13 mm. long, 2-4 mm. broad, the three inner elliptic, oval, or ovate, 1.5-4 mm. long, 3-4 mm. broad; corolla rose-pink, densely glandular, the cylindrical tube 1-1.8 cm. long, the lobes unequal, oblong to ovate, 10-20 mm. long, 5-13 mm. broad; carpels compressed; seeds tuberculate.

High forests of the eastern mountains of Porto Rico. Endemic. TORTUGO PRIETO.

2. **ZANTHOXYLUM** [Catesby] L. Sp. Pl. 270. 1753.

Trees or shrubs with alternate, equally pinnate, odd-pinnate or unifoliolate, evergreen or deciduous leaves, the twigs and petioles commonly prickly. Inflorescence terminal or axillary, cymose, paniculate, racemose, spicate, glomerate, or rarely 1-flowered. Flowers whitish or greenish, small. Sepals 3 or 5, or none. Petals 3-5. Staminate flowers with 3 or 5 hypogynous stamens. Pistillate flowers 1-5-carpellary. Carpels 2-ovuled. Follicles 1-5. Seeds oblong, ovoid, or globose, black or reddish, shining. [Greek, yellow-wood.] About 150 species, of temperate and tropical regions, known as ESPINO, ESPINO RUBIAL, PRICKLY ASH and YELLOW-WOOD. Type species: *Zanthoxylum Clava-Herculis* L.

Inflorescence congested, scattered in the axils of the leaves, or rarely terminal on the same branches, few-flowered.

Sepals, petals, and stamens 3; petioles and rachis wingless.

Pistillate flowers 2-carpellary; follicles 3.5-4.5 mm. long; lateral leaflets 2-8 cm. long, 1-4 cm. broad.

Pistillate flowers 3-carpellary; follicles 7-8 mm. long; lateral leaflets 1.5-2.5 cm. long, 1.3-2 cm. broad.

Sepals, petals and stamens 4; petioles and rachis wing-margined.

Inflorescence terminal, or lateral in the axils of the upper leaves, commonly many-flowered; sepals, petals and stamens 5.

Leaves unifoliolate.

Leaves several-foliolate.

Sepals suborbicular, strongly imbricate in flower; plant

glabrous or nearly so; pistillate flowers 5-carpellary.

Sepals triangular or triangular-ovate, not strongly im-

bricate in flower.

Young growth, branches of the inflorescence and often

the petioles and under surface of the leaflets pubescent

with simple hairs; pistillate flowers 5-carpellary.

Young growth, branches of the inflorescence and often

the petioles and under surface of the leaflets minutely

stellate canescent; pistillate flowers 1-3-carpellary.

1. **Zanthoxylum punctatum** Vahl; West, Bidr. St. Croix 310. 1793.

Fagara trifoliolata Sw. Prodr. 33. 1788.

Zanthoxylum ternatum Sw. Fl. Ind. Occ. 1: 570. 1797.

Tobinia ternata Hamilt. Prodr. 57. 1825.

Tobinia punctata Griseb. Fl. Br. W. I. 137. 1859.

Zanthoxylum trifoliotum Krug & Urban; Urban, Bot. Jahrb. 21: 584, as synonym, 1896. Not L. 1753.

1. *Z. punctatum*.

2. *Z. thomsonianum*.

3. *Z. spinifer*.

4. *Z. monophyllum*.

5. *Z. caribaeum*.

6. *Z. martinicense*.

7. *Z. flavum*.

A shrub, or small tree sometimes 8 m. tall, the flowering branches and their leaves usually unarmed, the sterile branches with petioles, rachis and midrib of the under surface of the leaflets nearly always armed with straight slender brownish prickles. Leaves odd-pinnate or occasionally equally-pinnate; leaflets 2-7, commonly 3, or sometimes 9-19 on leaves of the sterile branches, broadly obovate or elliptic-lanceolate, 2-8 cm. long, 1-4 cm. broad, short-petioluled or subsessile, emarginate, rounded, acute or short-acuminate at the apex, acute to cuneate at the base, minutely crenulate; inflorescence axillary, short; calyx about 1 mm. broad; sepals 3, semiorbicular to triangular-ovate; petals 3, elliptic to orbicular-ovate, 1.7-2.5 mm. long, 1-2.2 mm. broad, the staminate flowers with 3 stamens; pistillate flowers 2-carpellary; follicles 1 or 2, globose or subglobose, 3.5-4.5 mm. long, 3-3.8 mm. in diameter; seeds globose, reniform, 2.9-3.2 mm. long, 2.2-2.7 mm. broad.

Thickets at low elevations in the dry southwestern districts of Porto Rico; Mona; St. Croix.—Hispaniola; St. Martin to Trinidad.

2. **Zanthoxylum thomasianum** Krug & Urban; P. Wilson, N. A. Fl. 25: 182. 1911.

Fagara thomasiana Krug & Urban; Urban, Bot. Jahrb. 21: 583. 1896.

A shrub, 2 m. high or higher, with minutely papillose twigs, the flowering branches and twigs prickly. Leaves 3-6 cm. or more long, odd-pinnate; leaflets 5-9, sessile, ovate or orbicular, the terminal one obovate and short-petioluled, 1.5-2.5 cm. long, 1.3-2 cm. broad, rounded or subtruncate and apiculate or very short-acuminate at the apex, obtuse or rounded at the base; inflorescence lateral, sessile, glomerate, few-flowered; sepals about 1 mm. long; petals oval, 2.5-3 mm. long, 2 mm. broad; staminate flowers with 3 stamens; pistillate flowers 3-carpellary; follicles 3, sometimes 2 or 1 abortive, ovoid, 7-8 mm. long, 5 mm. broad; seeds ovate, 5 mm. long, 4 mm. broad, black. [*Z. spinosum* of Krebs, not of Swartz.; *Tobinia spinosa* of Eggers, not of Hamilton.]

Mountain forests, St. Thomas; St. Jan. Endemic.

3. **Zanthoxylum spinifex** (Jacq.) DC. Prodr. 1: 728. 1824.

Fagara spinifex Jacq. Fragm. 10. 1809.

Fagara microphylla Desf.; Hamilt. Prodr. 21. 1825.

Zanthoxylum microphyllum Desf. Cat. Hort. Paris ed. 3, 256. 1829.

A shrub, 1-3 m. high, or a small tree, the branches, petioles and rachis unarmed or armed with straight slender brownish prickles 3-8 mm. long; leaves 1-4.5 cm. long, odd-pinnate; leaflets 3-11, linear-oblong to elliptic or ovate, occasionally obovate, 0.3-1.5 cm. long, 1-5.5 mm. broad, sessile or very short-petioluled, rounded or truncate and sometimes emarginate at the apex, callus-bearing, cuneate to slightly rounded at the base, entire; petioles and internodes of the rachis winged; flowers solitary or glomerate in the axils of the leaves; sepals triangular, obtuse, 0.5 mm. long; petals 4, ovate to elliptic; staminate flowers with 4 stamens; pistillate flowers 2-carpellary; follicles sessile or short-stipitate, united below, globose or globose-obovoid, 2.5-3.4 mm. in diameter; seeds ovoid or subglobose, 2.5-3 mm. long. [*Fagara tragodes* of West, not of Jacquin; *Zanthoxylum tragodes* of Krebs, not of de Candolle.]

Hillside thickets and arroyos at lower elevations in the dry southern districts of Porto Rico; St. Croix; St. Thomas (according to Krebs); Buck Island, St. Thomas (according to Eggers, but not seen there by us in 1913).—Cuba; Hispaniola, Antigua to St. Lucia and Barbados; Venezuela. NIARAGATO.

4. **Zanthoxylum monophyllum** (Lam.) P. Wilson, Bull. Torrey Club 37: 86. 1910.

Fagara monophylla Lam. Tabl. Encycl. 1: 334. 1791.

Zanthoxylum simplicifolium Vahl, Eclog. 3: 45. 1807.

Zanthoxylum Ochroxyllum DC. Prodr. 1: 725. 1824.

Zanthoxylum macrophyllum Ryan; Eggers, Bull. U. S. Nat. Mus. 13: 38, as synonym. 1879.

A shrub or small tree, the branches unarmed or armed with flat-pyramidal, sharp-tipped or rounded prickles 2-9 mm. long. Leaves unifoliate, the leaflet oval or elliptic-oval, 3-14 cm. long, 1.5-5.4 cm. broad, those on sterile shoots larger, acute, obtuse or short-acuminate, rarely long-acuminate at the apex, acute or sometimes rounded at the base, entire or obscurely crenulate, glabrous; petioles 0.5-1.5 cm. long; panicles terminal, or often on lateral branches, 2-5 cm. long, the branches more or less hispidulous; calyx 1-1.3 mm. broad; petals elliptic-oblong or ovate, 2-2.6 mm. long, 0.8-1.5 mm. broad; staminate flowers with 5, rarely 4 stamens, about as long as the petals; pistillate flowers 2- or 3-carpellary; follicles globose or globose-obovoid, 3.5-4.5 mm. long; seeds globose-reniform, 3.4 mm. long, 2.7-3.3 mm. broad, black.

Woodlands, thickets, hillsides and arroyos at lower elevations, Porto Rico, most abundant in the dry southern districts; Vieques; St. Croix; St. Thomas; St. Jan.;—Hispaniola; Montserrat to Trinidad; Costa Rica; northern South America. CARUBIO. MOPURITO. RUBIA. YELLOW PRICKLE.

5. *Zanthoxylum caribaeum* Lam. Encyc. 2: 39. 1786.

Fagara caribaea Krug & Urban; Urban, Bot. Jahrb. 21: 562. 1896.

A shrub, or tree up to 20 m. tall, the glabrous branches armed with short straight, dark brown prickles. Leaves 1.5-2.8 dm. long, equally pinnate or odd-pinnate; leaflets 7-13, elliptic-oblong to oval or ovate, 4.5-12 cm. long, 2.5-5 cm. broad, short-petioluled or sessile, rounded, obtuse or short-acuminate at the apex, somewhat cordate, rounded or acute at the base, equilateral or inequilateral, depressed-crenate or nearly entire, pellucid-glandular; panicles terminal, 4-20 cm. long, the branches corky-thickened; sepals 5; semiorbicular or suborbicular, rounded at the apex, 0.7-1 mm. long, 0.9-1.5 mm. broad, nearly entire or fimbriate; petals elliptic to elliptic-ovate, or somewhat obovate, 3-5 mm. long, about 1 mm. broad; staminate flowers with 5 stamens; pistillate flowers 5-carpellary; follicles 4.5-8 mm. long, 4-6 mm. broad, the base stipe-like, the body reniform, obliquely orbicular or obliquely obovoid; seeds 4-5 mm. long, black. [*Z. aromaticum* of Bello and of Stahl, not of Willdenow.]

Woods and hillsides at low elevations, southern and western districts of Porto Rico;—Guadeloupe; Martinique; Barbados; Mexico and northern South America.

6. *Zanthoxylum martinicense* (Lam.) DC. Prodr. 1: 726. 1824.

Fagara martinicensis Lam. Tabl. Encycl. 1: 334. 1792

Zanthoxylum lanceolatum Poir. in Lam. Encycl. Suppl. 2: 293. 1811.

Zanthoxylum juglandifolium Berterianum DC. Prodr. 1: 727. 1824.

A tree, often 20 m. high, armed with stout pyramidal or conic prickles sometimes 5.5 cm. long and 6.5 cm. broad, the twigs hispidulous, armed or unarmed. Leaves odd-pinnate or occasionally equally pinnate, 1-3.5 dm. long; leaflets 5-15, oblong, oblong-lanceolate, obovate, elliptic, or rarely ovate, 3-13 cm. long, 1.5-4.3 cm. broad, often sessile or nearly so, acute, obtusely short-acuminate, rounded or emarginate at the apex, obliquely rounded or acute at the base, inequilateral, glossy and often somewhat hispidulous especially on the midvein above, paler and hispidulous on the veins beneath; petioles and rachis unarmed or armed with brownish prickles, hispidulous, panicles terminal and axillary, 0.6-1.5 dm. long, the branches hispidulous; calyx 1-1.4 mm. broad; petals ovate or elliptic-ovate, 2-3 mm. long, 1-1.3 mm. broad; staminate flowers with 5 stamens; pistillate flowers 5-carpellary; follicles close together, sessile, connate below or to the middle, 4-6 mm. long, 3-4 mm. broad; seeds 3-4 mm. long, 2.5-3 mm. broad, black. [*Z. Clava-Herculis* of Krebs, of Eggers, of Bello and of Stahl, not of Linnaeus; ? *Z. acuminatum* of Bello, not of Sw.; ? *Fagara pterota* of Cook and Collins, not of Linnaeus.]

Wooded hills, forests, river valleys and arroyos, Porto Rico, at lower and middle elevations in moist and dry districts: Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Jamaica; Cuba; Hispaniola; Montserrat to Trinidad; also in South America. The light yellow wood used for furniture, in carpentry and in construction is hard and strong, its specific gravity about 0.93. CENIZO. WHITE PRICKLE.

7. *Zanthoxylum flavum* Vahl, *Eclog.* 3: 48. 1807.

Zanthoxylon cribrosum Spreng. *Syst.* 1: 946. 1825.

Fagara flava Krug & Urban; *Urban*, *Bot. Jahrb.* 21: 571. 1896.

Zanthoxylon jucundum Duchass.; Eggers, *Vidensk. Medd.* 1876: 108, as synonym. 1876.

An unarmed tree, reaching a maximum height of about 12 m. with a trunk about 4 dm. in diameter, usually smaller, sometimes shrubby, the light gray bark nearly smooth, the twigs finely stellate-pubescent when young, soon glabrous. Leaves 1–2.5 dm. long, odd-pinnate, finely stellate-canescens when young; leaflets 3–11, mostly 5 or 7, ovate or lanceolate to elliptic, very nearly sessile, obtuse or acutish at the apex, rounded, subtruncate, or somewhat acutish at the base, crenate or nearly entire, pellucid-punctate; panicles terminal, many-flowered, 5–15 cm. long; pedicels and rachis stellate-canescens; calyx 1–1.4 mm. broad; petals elliptic-lanceolate or oblong-ovate, 2.5–4 mm. long; staminate flowers with 5, rarely 4 stamens about as long as the petals; pistillate flowers 1–3-carpellary; follicles obovoid, 5–9 mm. long; seeds black, shining, 4–5 mm. long, black. [*Z. Sumach* of Eggers, not of Macfadyen.]

Hillsides at low elevations, southwestern districts of Porto Rico and near Quebradillas; Bordeaux Hills, St. Jan (nearly extinct, according to Eggers, and not seen by us in St. Jan in 1913);—Florida; Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; Montserrat to St. Lucia. The yellow wood, now scarce, valued for cabinet work, furniture and veneer, is hard, strong and heavy, its specific gravity about 0.9. YELLOW SANDER. SATINWOOD.

Zanthoxylum Fagara (L.) Sargent, a very prickly shrub or small tree, was listed by Krebs, with the English name BASTARD IRON-WOOD, as found in St. Thomas, apparently in error, as it is not known within the limits of this Flora. [*Schinus Fagara* L.; *Zanthoxylum Pterota* H. B. K.]

3. *PILOCARPUS* Vahl, *Eclog.* 1: 29. 1796.

Trees or shrubs with mostly alternate, simple or compound leaves. Inflorescence terminal or axillary, racemose or spicate. Flowers perfect. Calyx 4- or 5-lobed. Petals 4 or 5. Stamens 4 or 5, inserted under the disk; filaments subulate, glabrous; anthers ovate. Ovary 4- or 5-lobed; 4- or 5-celled, immersed in the annular disk; style short, simple or 5-parted at the base; stigma capitate, 4- or 5-lobed; ovules 2 in each cavity. Fruit composed of 1–5 nearly distinct carpels which are concentrically ridged, 1-seeded, splitting above the middle into 2 valves. Testa membranous; cotyledons pear-shaped. [Greek, cap-fruit, from the shape of the fruit.] Type species: *Pilocarpus racemosus* Vahl.

1. *Pilocarpus racemosus* Vahl, *Eclog.* 1: 29. 1796.

Pilocarpus laurifolius Vahl; Eggers, *Bull. U. S. Nat. Mus.* 13: 37, as synonym. 1879.

A shrub or small tree. Leaflets 1–5, narrowly elliptic to oval or obovate, 4–17.5 cm. long, 2–9 cm. broad, retuse at the apex, cuneate or somewhat rounded at the base, entire, coriaceous; racemes 1.5–3.5 dm. long; pedicels 7–13 mm. long; petals ovate or oblong-ovate, 3.5–4 mm. long, 2–2.5 mm. broad, acute; filaments subulate; anthers ovate; follicles 8–11 mm. long, 6–8 mm. broad, dark brown or blackish; seeds black.

Mountain woodlands, northwestern districts of Porto Rico; Vieques; St. Jan;—Cuba; Montserrat; Guadeloupe; Martinique.

Pilocarpus pauciflorus St. Hil., a Brazilian tree, was recorded by Krebs in 1852 as an element of the strand vegetation of St. Thomas: this is an error of some kind.

4. **RUTA** [Tourn.] L. Sp. Pl. 383. 1753.

Perennial, strong-smelling herbs, sometimes woody at the base. Leaves alternate, simple or much divided. Flowers perfect, terminal in corymbose or panicked cymes. Sepals 4 or 5, persistent. Petals 4 or 5, yellow or greenish. Disk 8- or 10-lobed. Stamens 8 or 10, inserted at the base of the disk. Ovary 4- or 5-celled, more or less 4- or 5-lobed. Ovules several in each cavity. Capsule 4- or 5-celled, 4- or 5-lobed. Seeds angled; endosperm fleshy; embryo slightly curved; cotyledons sometimes 2-parted. [Classical name of rue.] About 40 species, natives of the Old World. Type species: *Ruta graveolens* L.

1. **Ruta chalapensis** L. Mant. 69. 1767.

A glaucous herb, 3-6 dm. high or more. Leaves twice or thrice pinnately divided, the segments linear to elliptic or obovate, rounded or notched at the apex; sepals ovate, crenulate, 3.5-4 mm. long; petals with an involute margin and apex, fringed, 7.5-9 mm. long; ovary with pointed lobes; capsule ovoid, 7-9 mm. wide, the apex of the lobes pointed.

Locally spontaneous after cultivation in Porto Rico gardens:—Jamaica; Cuba; Hispaniola; continental tropical America. Native of the Mediterranean region. RUDA.

5. **AMYRIS** [P. Br.] L. Syst. ed. 10. 996, 1000. 1759.

Shrubs or trees with opposite or alternate compound (sometimes unifoliolate), petioled leaves, and small white perfect flowers in terminal and axillary corymbiform panicles, the pedicels 2-bracteolate. Calyx 4-5-lobed. Petals 4 or 5. Stamens twice as many as the petals, borne on the disk; filaments filiform; anthers longitudinally dehiscent. Ovary 1-celled; ovules 2, pendulous; style short or none; stigma capitate or flat. Fruit a small drupe. Seed-coat membranous; cotyledons thick, fleshy. [Greek, much balsam.] About 15 species, natives of tropical and subtropical America. Type species: *Amyris balsamifera* L.

Ovary glabrous; fruit globose, 5-8 mm. long. 1. *A. elemifera*.
Ovary hispidulous; fruit obovoid or ellipsoid, 6-14 mm. long. 2. *A. balsamifera*.

1. **Amyris elemifera** L. Syst. ed. 10, 1000. 1759.

Amyris maritima Jacq. Enum. 19. 1760.

Amyris sylvatica Jacq. Sel. Am. Hist. 107. 1763.

Elemifera maritima Kuntze, Rev. Gen. Pl. 100. 1891.

A shrub or tree, sometimes 17 m. high, glabrous or the young twigs and inflorescence minutely pubescent. Leaves opposite, or mostly so; leaflets 3 or 5, coriaceous, lanceolate to ovate or rhombic-ovate, 2-7 cm. long, 1-4.5 cm. broad, acute, acuminate or rounded at the apex, cuneate, rounded or subtruncate at the base, crenulate or entire, petioluled; panicles several-many-flowered; calyx-lobes ovate; petals obovate or oval, 2-3.5 mm. long; ovary glabrous; stigma sessile; drupe globose, black, 5-8 mm. long, glaucous.

Thickets, hillsides and arroyos, at low elevations, Porto Rico, most abundant in the dry southern districts; Mona; Desecheo; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Anegada;—Florida; West Indies south to Grenada; Central America. Its wood, used for furniture and for torches, is light yellow, hard, durable and strong, with a specific gravity of about 1.00. TEA. TORCHWOOD.

2. **Amyris balsamifera** L. Syst. ed. 10, 1000. 1759.

Elemifera balsamifera Kuntze, Rev. Gen. Pl. 100. 1891.

A shrub or medium-sized tree, the branches of the inflorescence hispidulous, at least when young. Leaves opposite; leaflets 3-7, coriaceous, lanceolate to ovate or rhombic-ovate, 3-13 cm. long, 1.3-6 cm. broad, acute to long-acuminate at the apex; cuneate or somewhat rounded at the base, entire or crenulate; panicles often many-flowered; calyx hispidulous; petals obovate or oval, 3-3.5 mm. long, 1.5-2 mm. broad; ovary hispidulous; stigma sessile or stipitate; drupe oblong-ovoid to obovoid, often tapering at the base into a short neck, 6-14 mm. long, 3.5-9 mm. thick.

Woodlands near Guanica, Porto Rico:—Florida; Jamaica; Cuba; Hispaniola; Honduras; northwestern South America.

6. **TRIPHASIA** Lour. Fl. Coch. 1: 152. 1790.

Evergreen shrubs, mostly with spiny branches. Leaves alternate, trifoliolate, or occasionally 1- or 2-foliolate. Flowers solitary, or several in axillary cymes. Calyx 3- or 4-lobed. Petals 3 or 4. Stamens 6, inserted on a fleshy disk; filaments compressed; anthers oblong. Ovary 3- or 4-celled, style deciduous; stigma 3- or 4-lobed. Ovules solitary in each cell. Berry 1-3-seeded. Seeds oval or subglobose; testa fleshy; cotyledons plano-convex, rather thick; occasionally lobed; embryo straight. [Greek, triple, from the usually 3-parted flowers.] One species, or more, native of Asia, the following one widely cultivated and naturalized in tropical regions. Type species: *Triphasia Aurantiola* Lour.

1. **Triphasia trifolia** (Burm. f.) P. Wilson, Torrey 9: 33. 1909.

Limonia trifolia Burm. f. Fl. Ind. 103. 1768.

Limonia trifoliata L. Mant. 237. 1771.

Triphasia Aurantiola Lour. Fl. Coch. 1: 153. 1790.

Triphasia trifoliata DC. Prodr. 1: 536. 1824

A shrub, sometimes 2 m. or more in height, with puberulent twigs, the spines axillary, paired, 5-17 mm. long. Leaflets crenate, ovate to oval, the lateral ones 1-3.5 cm. long, 1-2.7 cm. broad, obtuse or rounded and emarginate at the apex, cuneate or sometimes rounded at the base, the terminal leaflet larger; petioles short, puberulent; flowers short-peduncled; calyx puberulent, the lobes broadly triangular, ciliate; petals oblong, white, 12-16 mm. long, 5-6 mm. broad; berry oval or subglobose, red, 10-16 mm. long.

Spontaneous after cultivation in Porto Rico and locally naturalized; often planted in Porto Rican and Virgin Island gardens, and luxuriant; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—southern United States; widely naturalized in tropical America. Native of the East Indies. CHINITA. LIMONCILLO. LIMONCILLO DE JERUSALEM. CHINA FORASTERA. SWEET LIME.

7. **CHALCAS** L. Mant. 11, 68. 1767.

[MURRAEA Koenig; L. Mant. 554, 563. 1771.]

Shrubs or small trees with unarmed branches. Leaves alternate or subopposite. Flowers solitary, or several in terminal axillary cymes. Calyx 4- or 5-lobed. Petals 4 or 5. Stamens 8 or 10, inserted on the disk; filaments linear-ligulate; anthers small. Ovary 2-5-celled; style deciduous; stigma capitate. Ovules solitary or 2 in each cell, superposed or collateral. Berry 1-5-celled. Seeds 1-several; testa woolly or glabrous. Cotyledons plano-convex. [From Greek for copper, as the wood has a copper-colored grain. About 4 species, natives of the East Indies. Type species: *Chalcas paniculata* L.

1. *Chalcas exotica* (L.) Millsp. Field. Col. Mus. Bot. 1: 25. 1895.*Murraea exotica* L. Mant. 563. 1771.*Camunium exoticum* Kuntze, Rev. Gen. Pl. 99. 1891.

Shrub or small tree. Leaflets 3-9, ovate, oval, or sometimes obovate, 1.5-5 cm. long, 0.7-2.3 cm. broad, obtuse or obtusely acuminate and frequently emarginate at the apex, cuneate at the base, short-petioled; flowers fragrant; sepals triangular, obtuse, glabrous or puberulent; petals white, oblanceolate, obovate, or spatulate, 1.2-2.3 cm. long, 3.5-7 mm. broad; ovary glabrous; berry ovoid or subglobose, 1-1.6 cm. long, red.

Locally spontaneous after cultivation in Porto Rico; St. Croix; St. Thomas; Tortola;—widely cultivated for ornament and occasionally spontaneous in the West Indies and in continental tropical America. MIRTO. CAFE DE LA INDIA.

8. **CITRUS** L. Sp. Pl. 782. 1753.

[LIMON Mill. Gard. Dict. Abr. ed. 4. 1754.]

Aromatic shrubs or small trees, mostly with thorny branches. Leaves alternate, usually persistent and unifoliolate, pellucid-glandular. Petioles winged or wingless. Flowers perfect, white or purplish-pink, sweet-scented. Calyx 3-5-toothed. Petals 4-8, glandular. Stamens 16-60, united or separate. Ovary several-celled, the styles united, deciduous. Ovules several in each cavity. Fruit an oblong, globose or pear-shaped berry with a leathery rind and a juicy pulp, often edible. Seeds several in each cavity. Testa white, leathery. Cotyledons fleshy. [Ancient name of a fragrant African wood.] A genus of many species and varieties, natives of southern Asia, but widely cultivated in tropical and subtropical regions and often naturalized. Type species: *Citrus medica* L.

Fruit of an ellipsoid type, commonly mamillate at the apex.

Fruit large, 12-20 cm. long, 9-15 cm. in diameter, the rind 3-7 cm. thick; pulp scant; petiole usually wingless.

Fruit smaller, the rind relatively thin; pulp well developed; petioles winged or wingless.

Fruit 6-10 cm. long, 3.5-8 cm. thick; pulp light colored; leaflets often pointed; flowers 3-5 cm. broad; petioles often wingless.

Fruit 3.5-6.5 cm. long, 2.8-5 cm. thick; pulp greenish; leaflets commonly rounded at the apex; flowers 2-2.5 cm. broad, petioles commonly winged.

Fruit globose or subglobose, not mamillate; petioles usually winged. Petioles slightly winged; fruit with a solid core.

Petioles broadly winged; fruit with a hollow core.

1. *C. Medica*2. *C. Limonum*.3. *C. aurantifolia*.4. *C. sinensis*.5. *C. Aurantium*.1. **Citrus Medica** L. Sp. Pl. 782. 1753.

A shrub or small tree, with long irregular branches, unarmed or armed with stout thorns 1-3.5 cm. or more long; petioles wingless; leaflet oblong to elliptic, occasionally somewhat oblong-obovate, 12-20 cm. long, 4-6 cm. broad, acutish, or rounded and sometimes emarginate at the apex; the margins serrulate-crenate; flowers axillary in compact clusters; petals oblong, white within, tinged with purple on the outside; berry oblong to nearly globular, 12-20 cm. long, 9-15 cm. in diameter, often mamillate at the apex, smooth or coarsely wrinkled, lemon-yellow; rind 3-7 cm. thick; pulp scant and often rather dry, acid and somewhat bitter.

Sparingly naturalized after cultivation in Porto Rico; widely cultivated in tropical and subtropical regions. Native of southern Asia. CIDRA. CITRON.

2. **Citrus Limonum** Risso, Ann. Mus. Paris 20: 201. 1813.*Citrus Medica Limon* L. Sp. Pl. 782. 1753.

A shrub or small tree, with grayish bark and smooth angular or roundish, usually thorny branches; petioles wingless, sometimes narrowly margined;

leaflet oblong-elliptic to ovate-oval, 5–11 cm. long, 3–5 cm. broad, crenate, acute or acuminate at the apex; flowers 3–5 cm. broad, solitary or in pairs, axillary; petals white within, purplish on the outside; berry ellipsoid to oval or ovoid, 6–10 cm. long, 3.5–8 cm. broad, often mamillate at both base and apex, smooth or coarsely wrinkled, light yellow, the rind often thin, the pulp usually abundant, juicy and acid; seeds oval, pointed.

Thickets at lower and middle elevations, Porto Rico, naturalized after cultivation. Cultivated and naturalized in most tropical and subtropical regions. Native of southern Asia. LIMON. LEMON. A well-established Chinese Dwarf Lemon was seen at the Insular Agricultural Experiment Station, Rio Piedras, Porto Rico.

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

Limonia aurantifolia Christm. in L. Pflanzensystem. 1777.

Limon spinosum Mill. Gard. Dict. ed. 8. 1768. Not *Citrus spinosa* S. G. Gmel.

? *Citrus Limonia* Osbeck, Reise Ostind. China 250. 1765.

Citrus Lima Lunan, Hort. Jam. 451. 1814.

Citrus spinosissima Meyer, Fl. Esseq. 247. 1818.

Citrus acida Roxb. Fl. Ind. **3**: 390. 1832.

Citrus Limnetta Wight, Ic. **3**: 4, in part. 1845. Not Risso.

Citrus Hystrix acida Bonavia; Urban, Symb. Ant. **4**: 321. 1905.

A shrub or small tree, sometimes 6 m. tall, the branches usually armed with sharp thorns, the petioles winged. Leaflet oblong-elliptic to oval, 6.5–9 cm. long, 1.7–5 cm. broad, commonly rounded at the apex, the margin crenulate; flowers 2–2.5 cm. broad, in axillary clusters of 3–10; petals white; berry ellipsoid or oval, 3.5–6.5 cm. long, 2.8–5 cm. in diameter; frequently mamillate at the apex, light yellow, the rind thin, smooth or more or less roughened, the pulp greenish, acid; seeds oval, pointed. [*C. medica Limonum* of Eggers.]

Woodlands, thickets and hillsides, Porto Rico; St. Thomas; St. Jan; St. Croix; naturalized after cultivation. Cultivated and naturalized in most tropical and subtropical regions. LIMA. LIME.

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

Citrus Aurantium sinensis L. Sp. Pl. 782. 1753.

Citrus Aurantium of authors, not of Linnaeus.

A tree, sometimes 12 m. high, with light green, glabrous twigs, the branches smooth, grayish-brown, often armed with small sharp thorns, the petioles commonly narrowly winged, or wingless. Leaflets oblong-ovate to ovate or oval, 6.5–13 cm. long, 3–10 cm. broad, acute or sometimes rounded at the apex, cuneate to rounded at the base, dark green and lustrous above, paler beneath, entire or crenulate; petals oblong, 11–18 mm. long, white on both sides; berry globose or subglobose, 6–9 cm. long, 6.5–9.5 cm. broad, the rind usually thin, the pith solid, the pulp usually sweet, not bitter.

Occasionally spontaneous after planting in Porto Rico; St. Croix; St. Thomas;—extensively cultivated for its fruit in all tropical and subtropical regions, and one of the most important fruits of Porto Rico. Its wood is light yellow, hard, strong, tough and durable; it is used for furniture, canes, in cabinet work, and for various small articles. CHINA. CHINA DULCE. SWEET ORANGE.

5. **Citrus Aurantium** L. Sp. Pl. 782. 1753.

Citrus buxifolia Poir in Lam. Encycl. **4**: 580. 1797.

Citrus vulgaris Risso, Ann. Mus. Paris **20**: 190. 1813.

Citrus bigaradia Loisel. Nouv. Duham. **7**: 99. 1819.

Citrus Aurantium bigaradia Hook. Fl. Br. Ind. **1**: 515. 1872.

A medium-sized tree, the branches armed with sharp thorns, the petioles often broadly winged. Leaflets ovate, 6–12 cm. long, 3.5–10 cm. broad, more or less acuminate at the apex; flowers axillary, single or clustered, sweet-scented;

sepals often bluntish; petals oblong, white on both sides; berry globose or sub-globose, 7-9 cm. in diameter, with a hollow core when fully ripe, the rind thick, more or less roughened, the pulp acid and bitter.

Spontaneous after planting in Porto Rico; St. Thomas; St. Croix;—cultivated and naturalized in tropical regions. The wood is similar to that of the Sweet Orange. NARANJA. SOUR ORANGE. FORBIDDEN FRUIT.

Citrus grandis (L.) Osbeck., TORONJA, POMELO, SHADDOCK, GRAPEFRUIT, of Asiatic origin, cultivated in Porto Rico and the Virgin Islands for its fruit, and one of the most important crops of Porto Rico, is a small tree, the young shoots and leaves sparsely pubescent, the petioles broadly winged, the globose or somewhat pyriform fruit 9-18 cm. in diameter, lemon-yellow or flesh-colored, the rind usually smooth, the pulp acid and often bitter. [*C. Aurantium grandis* L.; *C. Aurantium decumana* L.; *C. decumana* L.]

Citrus Limetta Risso, LIMON DULCE, SWEET LIME, of Old World origin, is sometimes cultivated in Porto Rico. It is a small spiny-armed tree, the sub-globose fruit with a sweet insipid juice; supposed to be of hybrid origin.

Citrus nobilis Lour., KING ORANGE, MANDARIN, TANGERINE, differing from other citrus fruits in the rind being loose and readily separable from the pulp, grown in Porto Rico in several races, is a small tree with dark green leaves, the petioles narrowly margined.

Fortunella margarita (Lour.) Swingle, KUMQUAT, Chinese, occasionally grown for its fruit in Porto Rico, is a usually unarmed shrub or small tree, with oblong-lanceolate leaves, small white axillary flowers and yellowish-orange oblong fruit 2.5-3 cm. long. [*Citrus margarita* Lour.]

Clausena lansium (Lour.) Skeels, East Indian, has been cultivated on St. Croix. It is a small tree with odd-pinnate leaves, 1-3 dm. long, the elliptic or elliptic-ovate leaflets 3.5-10 cm. long, 2-5.5 cm. broad, the small flowers are in terminal panicles. [*Cookia punctata* Sonnerat; *Quinaria lansium* Lour.; *Cookia Wampí* Blanco; *Clausena Wampí* Oliver; *Clausena punctata* Rehder & Wilson, not Voigt.]

Casimiroa tetrameria Millsp., Central American, a fruit tree planted at the Insular Agricultural Experiment Station, Rio Piedras, Porto Rico, in 1923, has digitately 3-5-foliolate leaves, clustered small 4-6-parted flowers, the drupe mostly 5-celled.

Atalantia trimera Oliver [*Triphasia monophylla* DC.], a Malayan tree of this family was recorded by Krebs as grown in St. Thomas prior to 1851.

Family 7. SURIANACEAE Lindl.

BAY CEDAR FAMILY.

The family consists only of the following genus:—

1. SURIANA [Plum.] L. Sp. Pl. 284. 1753.

A branching shrub or small tree, with simple alternate entire leaves. Flowers perfect, solitary, or in few-flowered terminal clusters. Calyx of 5 persistent sepals. Corolla of 5 imbricated petals. Stamens 10; filaments nearly distinct, those opposite the petals shorter. Disk adnate to the base of the calyx, or ob-

solete. Carpels 5, distinct; ovules 2, collateral, ascending; styles 5, latera' filiform; stigmas capitate. Fruits achene-like. Embryo thick, horse-shoe-shaped. [Named for Joseph Donat Surian, of Marseilles.] A monotypic genus.

1. **Suriana maritima** L. Sp. Pl. 284. 1753.

A shrub, 2 m. high or less, or sometimes a small tree, the twigs densely leafy, pubescent. Leaves linear-spatulate, 1-4 cm. long, 2-6 mm. wide, rather fleshy, sessile, densely pubescent, obtuse; flowers few, in short clusters; sepals lanceolate to ovate, 6-10 mm. long, acuminate; petals obovate, yellow, 7-9 mm. long, erose near the apex; fruit 8-10 mm. broad, the achene-like carpels 4-5 mm. long, finely pubescent.

Coastal sands and rocks, Porto Rico; Mona; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda; Anegada:—Florida; Bermuda; West Indies; continental tropical America and Old World tropics. TEMPORANA. GITARAN. BAY CEDAR. TASSEL-PLANT.

Family 8. **SIMAROUBACEAE** DC.

QUASSIA FAMILY.

Trees and shrubs, the bark usually bitter and containing oil-saes, with pinnate (rarely simple), mostly alternate leaves and small, dioecious or polygamous, paniced, racemose, or sometimes solitary, axillary flowers. Calyx of 3-7 distinct or partly united sepals. Corolla of 3-7 distinct imbricate or rarely valvate petals, or wanting. Stamens as many or twice as many as the petals, rarely more numerous. Carpels 2-5, distinct or united; styles distinct, united or none; ovules mostly 1 or 2 in each cavity. Fruit various, usually 1-seeded. About 30 genera, comprising some 150 species, mostly tropical, a few in the temperate zones.

Carpels 1-ovuled.

Filaments appendaged.

Stigmas distinct.

Stigmas united.

Filaments unappendaged.

Stamens 8; leaves simple.

Stamens 4; leaves compound.

Carpels 2-ovuled.

1. *Simarouba*.

2. *Quassia*.

3. *Castalaria*.

4. *Aeschrion*.

5. *Picramnia*.

1. **SIMAROUBA** Aubl. Pl. Guian. 2: 859. 1775.

Shrubs or trees, usually with bitter bark, the leaves alternate, pinnate, the leaflets entire, the small, terminal or axillary paniced flowers monoecious or dioecious. Sepals 4-6, partly united. Petals 4-6, much longer than the calyx. Stamens 8-12, often represented by dilated staminodia in the pistillate flowers; filaments subulate, appendaged at the base; anthers narrow. Ovary sessile, usually 5-celled; carpels distinct. Fruit drupaceous. [Guiana name.] About 5 species of tropical and subtropical America. Type species: *Simarouba amara* Aubl.

1. **Simarouba Tulae** Urban, Jahrb. Bot. Gart. Berlin 4: 245. 1886.

A medium-sized tree, up to about 18 m. high, the trunk 3-5 dm. in diameter, with furrowed bark, and light yellow, hard, fine-grained wood, sometimes shrub-like. Leaves 1.5-3.5 dm. long, glabrous, the leaflets 6-10, oblong to elliptic, 5-11 cm. long, 2-4.7 cm. wide, acuminate at the apex, acute at the base, bright green and somewhat lustrous above, yellowish-green and dull beneath, short-petioluled; panicle 0.7-2 dm. long, sparingly branched; calyx-lobes ovate or tri-

angular-ovate, acutish; petals elliptic or oblong-elliptic, 9–11 mm. long, 3 mm. broad, obtuse or emarginate at the apex; drupes broadly obovoid, flattened, 2.5–3.4 cm. long, 1.3–2.5 cm. in diameter. [*S. amara* of Bello, not of Aublet.]

Mountain forests of Porto Rico. Endemic. Its wood, now scarce, is strong and durable, with a specific gravity of about 0.85. ACEITILLO.

2. *QUASSIA* L. Sp. Pl. ed. 2, 553. 1762.

Trees with bitter wood, the leaves alternate, equally or unequally pinnate, the leaflets few. Flowers perfect, mostly in terminal racemes or panicles. Sepals 5, distinct, deciduous. Petals 5, distinct, many times longer than the sepals. Stamens 10, inserted at the base of the disk, the filaments slender, elongate, with short appendages. Ovary immersed in the disk, deeply 5-parted; styles united. Drupes 5, spreading, slightly flattened. [Aboriginal name.] About 5 species, natives of tropical America and Africa. Type species: *Quassia amara* L.

1. *Quassia amara* L. Sp. Pl. ed. 2, 553. 1762.

A small tree with glabrous twigs. Leaves 1–3 dm. long, the rachis and petioles broadly winged, the leaflets 3 or 5, elliptic, oval or obovate, 5.5–12 cm. long, 2–5 cm. broad, acuminate at the apex, often more or less contracted at the base, sessile or nearly so, glabrous; panicles erect, 1–3 dm. long; sepals ovate, 2–2.5 mm. long, about 1.2 mm. broad, ciliolate; petals linear or linear-lanceolate, 2.5–3 cm. long, 4–5 mm. broad, scarlet; drupes oval or obovoid-oval, 1–1.5 cm. long.

Planted for ornament and interest in Porto Rico, St. Croix, St. Thomas, and St. Jan; occasionally spontaneous after cultivation, as elsewhere in the West Indies. Native of Trinidad and continental tropical America. QUASSIA WOOD.

3. *CASTELARIA* Small, N. A. Fl. 25: 230. 1911.

Shrubs or small trees, with numerous branches, the branchlets often thorn-like. Leaves alternate, simple, entire or obscurely toothed. Flowers dioecious, small, solitary or few together in the axils. Sepals 4, distinct or nearly so. Petals 4, imbricate. Stamens 8, as long as the petals or nearly so in the staminate flowers; filaments subulate or stout; anthers oblong or ovoid. Ovary composed of 4 carpels cohering at the apex; styles wanting or very short. Drupes 1–4, fleshy; endocarp hard. Endosperm scant or wanting; cotyledons thick, planoconvex. [Similar to *Castela*.] About 10 species, of warm-temperate and tropical America, the following typical.

1. *Castelaria Nicholsoni* (Hook.) Small, N. A. Fl. 25: 231. 1911.

Castela Nicholsoni Hook. Bot. Musc. 1: 271. 1830.

A much-branched, erect, virgate, usually thorny shrub, 1–2.5 m. high with stiff velutinous branches and twigs, the foliage dense. Leaves oblong to elliptic or somewhat obovate, 1–2.5 cm. long, 3.5–12.5 mm. broad, rounded or abruptly short-pointed at the apex, acutish or rounded at the base, gray-green and glabrous or nearly so above, hoary-tomentulose beneath, sessile or nearly so; flowers whitish, short-pedicelled; sepals triangular-ovate; petals obovate, 2.5 mm. long; drupes 6–10 mm. long. [*Castela erecta* of Eggers and of Millsbaugh, not of Turpin.]

Thickets and hillsides, eastern and southern dry parts of St. Croix;—Antigua; Venezuela.

Neocastela depressa (Turpin) Small, endemic in Hispaniola, was recorded by Krebs as found in St. Thomas.

4. **AESCHRION** Vell. Fl. Flum. 58. 1825.

[*PICRAENA* Lindl. Fl. Med. 208. 1838.]

Trees with bitter sap. Leaves alternate, odd-pinnate, the leaflets opposite, entire or rarely toothed. Inflorescence axillary, corymbose. Flowers polygamous. Sepals 4 or 5. Petals 4 or 5, those of the pistillate flowers larger than those of the staminate. Stamens 4 or 5; filaments slender; anthers short. Ovary 2-5-lobed; styles united below, free above; ovules solitary in each cell. Drupes solitary or 2-5 together; endocarp hard and brittle. [Commemorates a Greek physician.] About 4 species, natives of tropical America. Type species: *Aeschrion crenata* Vell.

Staminate flowers 6-7 mm. wide; drupes 11-13 mm. in diameter.
Staminate flowers 3-4 mm. wide; drupes 6-7.5 mm. in diameter.

1. *A. antillana*.
2. *A. excelsa*.

1. **Aeschrion antillana** (Eggers) Small, N. A. Fl. 25: 233. 1911.

Rhus antillana Eggers, Bull. U. S. Nat. Mus. 13: 41. 1879.

Picrasma antillana Urban, Symb. Ant. 5: 378. 1908.

A tree, 10 m. high or higher, the twigs pubescent. Leaves 2.5-4 dm. long, the rachis pubescent; leaflets 7-13, oblong, to ovate-oblong, 6-8 cm. long, 3.5-6.5 cm. broad, acuminate at the apex, the tip obtuse, more or less inequilateral and obtuse or rounded at the base, often somewhat pubescent on the veins; corymbs short-peduncled; sepals narrowly ovate or oval, 1 mm. long, pubescent; petals elliptic, those of the staminate flowers 2.5-3 mm. long; drupes globose or globose-obovoid, 11-13 mm. in diameter. [*Quassia excelsa* of West; *Picraena excelsa* of Eggers and of Millspaugh.]

Forests, St. Croix; St. Thomas; St. Jan.:—Lesser Antilles. BITTER ASH.

2. **Aeschrion excelsa** (Sw.) Kuntze, Rev. Gen. Pl. 103. 1891.

Quassia excelsa Sw. Prodr. 67. 1788.

Picraena excelsa Lindl. Fl. Med. 208. 1838.

Picrasma excelsa Planch. Lond. Jour. Bot. 5: 574. 1846.

Aeschrion excelsa microcarpa Krug & Urban; Urban, Bot. Jahrb. 15: 306. 1892.

A tree, up to 20 m. high, the twigs, petioles and rachis pubescent. Leaves 1.5-3.5 dm. long, the leaflets 9-13, oblong, oblong-ovate, lanceolate or elliptic, 4.5-12 cm. long, 2-4 cm. broad, acuminate at the apex, the tip obtuse, often somewhat inequilateral and acutish at the base, minutely pubescent, especially on the veins beneath; corymbs long-peduncled; sepals ovate, 0.6-0.9 mm. long, pubescent; petals oblong or oblong-elliptic, those of the staminate flowers 1.5-2 mm. long, those of the pistillate flowers 2.8-3 mm. long; drupes globose or globose-obovoid, 6-7.5 mm. in diameter.

Plains and arroyos, vicinity of Coamo Springs, Porto Rico;—Jamaica; Santo Domingo. BITTER WOOD.

5. **PICRAMNIA** Sw. Fl. Ind. Occ. 1: 217. 1797.

Trees or shrubs, with alternate, unequally pinnate leaves, and small dioecious flowers in narrow panicles. Sepals 3-5, slightly united at the base. Petals 3-5, or sometimes wanting. Stamens 3-5, in the pistillate flowers represented by small staminodia; filaments slender, unappendaged; anthers broad

Ovary 2-3-celled, sessile; stigmas 2 or 3, spreading; ovules 2 in each cavity, pendulous. Fruit baccate, globose to oblong or obovoid, the pulp juicy. [Greek, bitter shrub.] Some thirty species, of tropical and subtropical America. Type species: *Picramnia Antidesma* Sw.

1. **Picramnia pentandra** Sw. Fl. Ind. Occ. 1: 220. 1797.

Tariri pentandra Baill. Hist. Pl. 4: 441. 1873.

A shrub, or a small tree up to 10 m. high, the trunk sometimes 3 dm. in diameter, the young twigs and leaves finely appressed-pubescent, the wood hard, fine grained and heavy. Leaflets 5-9, chartaceous, oblong to ovate or lanceolate, 3-12 cm. long, acute, acuminate, or obtuse at the apex, narrowed at the base, shining above, becoming glabrous on both sides, the petiolules short; panicles slender, loosely branched, 7-15 cm. long; sepals 5, ovate, acute, about 2 mm. long; petals linear-lanceolate, about as long as the sepals; stamens 5; berries globose to oblong or obovoid, red or scarlet, 9-15 mm. long.

Woodlands, river valleys and arroyos, Porto Rico, at lower and middle elevations; St. Thomas (ex Krebs); Tortola.—Florida; West Indies. HUESO. GUAREMA. BITTER-BUSH.

Family 9. **BURSERACEAE** Kunth.

GUMBO-LIMBO FAMILY.

Shrubs or trees, mostly resiniferous or aromatic, with alternate, mostly pinnate, deciduous leaves, and small regular perfect or polygamo-dioecious flowers, usually panicle. Sepals 3-5, somewhat united below. Petals as many as the sepals and alternating with them. Stamens twice as many as the petals; filaments distinct, short; anthers 2-celled. Ovary superior, mostly 3-5-celled; ovules normally 2 in each cavity, pendulous; style usually very short; stigma broad. Fruit drupaceous. Seed-coat membranous; endosperm none. About 20 genera and over 300 species, mostly of tropical distribution.

Petals 4 or 5, distinct, imbricated in the bud; calyx free. 1. *Elaphrium*.

Petals 4 or 5, united; calyx free. 2. *Tetra gastris*.

Petals 3, distinct; calyx adherent to the ovary. 3. *Dacryodes*.

1. **ELAPHRIUM** Jacq. Enum. 3. 1760.

[*TEREBINTHUS* P. Br. Hist. Jam. 345. 1756. Not Miller. 1754.]

Leaves various, compound or simple. Inflorescence axillary. Flowers polygamo-dioecious. Calyx 4-5-lobed, the lobes spreading. Petals 4 or 5 ovate to oblong, much larger than the calyx-lobes, imbricated in the bud, inserted at the base of the disk. Stamens 8 or 10, distinct, inserted with the petals. Disk an entire ring. Ovary sessile, 3-celled. Fruit a globose or 3-angled drupe, the epicarp splitting into 2 or 3 coriaceous valves, the bony stone enclosed in fleshy pulp. [Greek, light; the wood is light in weight.] About 80 species, of tropical and subtropical America. Type species: *Elaphrium tomentosum* Jacq.

1. **Elaphrium Simaruba** (L.) Rose, N. A. Fl. 25: 246. 1911.

Pistacia Simaruba L. Sp. Pl. 1026. 1753.

Bursera gummiifera L. Sp. Pl. ed. 2, 471. 1762.

Bursera Simaruba Sarg. Gard. & For. 3: 260. 1890.

Terebinthus Simaruba W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

A tree, reaching a maximum height of about 20 m. with a trunk up to 1 m. in diameter, usually much smaller, the branches spreading, the thick red-brown smooth and shining bark peeling off in thin layers. Leaves glabrous or sometimes pubescent, petioled, 1–2 dm. long; leaflets 3–7, ovate to obovate, firm in texture, 3–8 cm. long, acute or acuminate; racemes glabrous or pubescent, 5–10 cm. long; pedicels 4–8 mm. long; calyx-lobes about 1 mm. long; petals greenish, 2–2.5 mm. long, ovate to oblong-lanceolate; drupes oblong, 3-angled, 5–10 mm. long, splitting into 3 valves; seed white.

Woodlands, hillsides and arroyos at lower and middle elevations, most abundant in dry districts, Porto Rico; Mona; Desecheo; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; West Indies; Mexico; continental tropical America. Often planted as a roadside shade-tree, and for fence-posts, growing promptly from cuttings. Its light brown wood is soft, weak, light, its specific gravity only about 0.3. ALMACIGO. GUMBO-LIMBO. WEST INDIAN BIRCH. TURPENTINE TREE. GUM TREE.

2. **TETRAGASTRIS** Gaertn. Fr. & Sem. 2: 130. 1791.

[*HEDWIGIA* Sw. Prodr. 4: 1788. Not Ehrh. 1781.]

Trees with alternate odd-pinnate leaves. Inflorescence axillary, paniculate. Flowers polygamous. Calyx free, 4- or 5-lobed, the lobes imbricate in the bud. Petals 4 or 5, more or less united. Stamens 8 or 10, equal. Ovary 4- or 5-celled, the style short, the stigma 4- or 5-lobed. Ovules 2 in each cell. Fruit a drupe, 2–4-celled. Testa coriaceous or membranaceous; cotyledons fleshy; radicle short. [Greek, referring to the fruit which is often 4-celled.] About 4 species, natives of the West Indies and continental tropical America. Type species: *T. ossea* Gaertn.

1. **Tetragastris balsamifera** (Sw.) Kuntze, Rev. Gen. Pl. 107. 1891.

Hedwigia balsamifera Sw. Prodr. 62. 1788.

Tetragastris ossaea Gaertn. Fr. & Sem. 2: 130. 1791.

A tree, sometimes 20 m. high, with a pale bark, the young twigs puberulent. Leaves 2–3.5 dm. or more long, the leaflets 3–9, lanceolate to elliptic or elliptic-ovate, 7–15 cm. long, 3–7 cm. broad, sometimes larger, acuminate at the apex, acute or rounded at the base, entire, glabrous, reticulate-veined beneath; inflorescence as long as the leaves or shorter; calyx-teeth acute; corolla 2.5–3 mm. long, the lobes oblong or elliptic-oblong, puberulent on the outside, inflexed; ovary glabrous; drupes 1.7 cm. or more in diameter, 2–4-lobed. [*Ephielis fraxinea* of Sprengel, not of Willdenow; ? *Icica altissima* of West.]

Forests, woodlands and arroyos at lower and middle elevations, Porto Rico, mostly in wet or moist districts; St. Croix (according to West);—Cuba; Hispaniola; Guadeloupe. The wood, used in carpentry, is light, strong, durable and fragrant. MASA. PALO DE ACEITE.

3. **DACRYODES** Vahl, Skr. Nat. Selsk. 6: 115. 1810.

Resinous forest trees with odd-pinnate leaves, the leaflets coriaceous, entire. Inflorescence axillary, paniculate. Flowers dioecious. Calyx cup-shaped, subtruncate. Petals 3, distinct, valvate in the bud, thick. Stamens 6, inserted at the base of the disk, the filaments short. Disk thick. Style short; stigma flat. Ovary adherent to the calyx, abortive in the staminate flowers. Drupe 1-celled, 1-seeded. [Greek, tearful, referring to the exuding resin.] Only 1 species, native of the West Indies.

1. **Dacryodes excelsa** Vahl, Skr. Nat. Selsk. 6: 117. 1810.

Amyris hexandra Hamilt. Prodr. 34. 1825.

Bursera acuminata DC. Prodr. 2: 78. 1825. Not Willd. 1806.

Dacryodes hexandra Griseb. Fl. Br. W. I. 174. 1859.

Pachylobus hexandrus Engler, in E. & P. Nat. Pfl. 3: 243. 1896.

A tree, up to 25 m. high or higher, with a nearly smooth gray bark, the trunk 9.6–1.5 m. thick. Leaves 1–2 dm. long, the leaflets 5–7, oblong-elliptic to oval, 6–12 cm. long, 2–7.5 cm. broad, occasionally larger, rounded or short-acuminate at the apex, acute or somewhat rounded at the base, glabrous, reticulate-veined; panicle 0.7–2 dm. long, the branches puberulent when young; calyx 2.5 mm. wide; petals broadly ovate, 2–2.5 mm. long, 2–2.2 mm. broad; drupe oblong-ellipsoid, 2.5–3 cm. long, about 1.3 cm. in diameter.

Forests, mostly at higher elevations, the most majestic tree of Porto Rico:—Montserrat to Grenada. The brown wood is hard, heavy and strong, used for furniture, in carpentry and construction. The trunks and roots exude a white fragrant resin, used for candles and torches. TABANUCO. CANDLE-TREE.

Icica altissima Aubl., a tree of French Guiana, was recorded by Krebs from St. Thomas, evidently in error.

Family 10. MELIACEAE Vent.

MAHOGANY FAMILY.

Mostly tropical shrubs or trees, or sometimes shrubby herbs. Leaves alternate, rarely opposite, without stipules, pinnately or digitately compound, or rarely simple. Inflorescence axillary or terminal. Flowers perfect or polygamo-dioecious, regular. Calyx with 4 or 5 lobes or sepals, rarely more or fewer. Petals 4 or 5, rarely 3 or 7, imbricated or valvate, free, or occasionally adnate to the lower part of the staminal tube. Stamens 8–10, or rarely fewer or more; filaments united into a tube, rarely free; anthers sessile or stalked. Carpels 2–5, united; ovary 2–5-celled; styles united. Ovules 2—many in each cavity, anatropous. Fruit a berry, capsule or drupe. Seeds sometimes winged; endosperm wanting or fleshy; embryo with leafy cotyledons. About 50 genera, including some 600 species, mostly tropical.

Filaments more or less united into a tube; petals not keeled.

Ovules not biseriata, 1 or 2 in each cavity of the ovary.

Fruit a drupe; leaves twice or thrice pinnately compound.

Fruit a 2–5-celled capsule; leaves once pinnate, digitately several-foliate or unifoliate.

Capsule 2- or 3-valved; radicle superior.

Capsule mostly 4-valved; radicle lateral.

Ovules biseriata, several in each cavity of the ovary.

Filaments free; petals keeled to the middle or below on the midrib of the inner face.

1. *Melia*.

2. *Trichilia*.

3. *Guarea*.

4. *Swietenia*.

5. *Cedrela*.

1. MELIA L. Sp. Pl. 384. 1753.

Trees, with alternate, pinnate or pinnately compound leaves, the leaflets stalked and serrate, the showy white to purple flowers numerous, in large axillary panicles. Calyx 5–6-parted, the lobes imbricated. Petals as many as the calyx-lobes, oblong or spatulate, spreading. Stamen-tube nearly cylindric, dilated and cleft above, bearing 10 or 12 erect anthers. Disk annular. Ovary 3–6-celled; ovules 2 in each cavity; style slender; stigma 2–6-lobed or capitate. Fruit a small drupe, its stone 1–5-celled. [A Greek name of the Ash.] About 25 Asiatic species, the following typical.

1. *Melia Azedarach* L. Sp. Pl. 384. 1753.

Melia sempervirens Sw. Prodr. 67. 1788.

A tree, sometimes 20 m. high, with a trunk up to 2 m. in diameter, usually much smaller, the reddish brown bark furrowed when old, the branches spreading. Leaves bipinnate, petioled, glabrous, or nearly so, 2–4 dm. long, deciduous; leaflets numerous, ovate to elliptic, thin, acuminate at the apex, rounded or

narrowed at the base, 3-7 cm. long, sharply serrate and sometimes lobed; panicles peduncled, 2-3 dm. long; pedicels slender, 4-10 mm. long; sepals acute, about 2 mm. long; petals purplish, oblong, obtuse, about 10 mm. long; drupes yellow, globose, smooth, 1.5-2 cm. in diameter.

Commonly spontaneous after planting in Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—southeastern United States; Bermuda; West Indies; Mexico; continental tropical America. Native of southeastern Asia. A race with drooping branches is occasionally planted. The brownish wood is weak, soft, coarse-grained; it is used for handles of tools and implements. LA LILA. PASILLA. PRIDE OF INDIA. HOG BUSH. Called LILAC in the Virgin Islands.

2. **TRICHILIA** P. Br.; L. Syst. ed. 10, 1020. 1759.

Trees or shrubs, the alternate leaves odd-pinnate, equally pinnate, digitately several-foliolate or unifoliolate. Leaflets opposite or alternate, often pellucid-dotted. Flowers perfect. Calyx 3-5-lobed, or rarely of distinct or nearly distinct sepals. Petals 4 or 5, rarely only 3, free or sometimes connate at the base. Stamens 4-10, the filaments often united into a cup-shaped staminal tube. Disk annular. Ovary 2-3-celled, sometimes immersed in the disk; stigma capitate, 2- or 3-lobed. Ovules 2 in each cell, occasionally solitary. Fruit a 2- or 3-celled, 2- or 3-valved capsule, loculicidally dehiscing from the apex. Seeds inverted; testa thin, coriaceous; cotyledons fleshy; radicle superior. [Greek, in threes, the flowers are sometimes trimerous.] Over 130 species, natives of tropical America, a few in tropical Africa. Type species: *Trichilia hirta* L.

Leaflets or their lobes spine-tipped.

1. *T. triacantha*

Leaflets not spine-tipped.

Inflorescence sessile, occasionally appearing panicle-like; through the underdevelopment of one of the lateral branches; calyx-lobes and petals 4.

2. *T. pallida*.

Inflorescence long-peduncled; calyx-lobes and petals 5.

3. *T. hirta*.

1. **Trichilia triacantha** Urban, Symb. Ant. 1: 329. 1899.

Acanthotrichilia triacantha Cook & Coll. Contr. U. S. Nat. Herb. 8: 65. 1903

A shrub, occasionally 10 m. tall, with grayish-brown branches, the young twigs densely puberulent. Leaves odd-pinnate, the leaflets 3-7, obovate-cuneate or cuneate, 1-3 cm. long, 0.5-1.5 cm. broad, broadest at the spinulose, 3-toothed apex, sessile or subsessile, reticulate-veined; inflorescence racemose or paniculate; calyx-tube short, cup-shaped, the margin obsoletely toothed; petals 4 or 5, in aestivation valvate, ovate or elliptic, 2-2.5 mm. long, coriaceous, minutely pilose on the back; staminal tube 2 mm. high; style a little shorter than the ovary; stigma capitate; disk wanting; ovary globose, tapering into the style, pilose; fruit unknown.

Woodlands and thickets at low elevations in the dry southwestern districts of Porto Rico. Endemic.

2. **Trichilia pallida** Sw. Prodr. 67. 1788.

? *Trichilia portoricensis* Spreng. Syst. 3: 68. 1826.

A shrub, or tree sometimes 15 m. tall, the young growth hirsute, the twigs brown, often scarred with elevated elliptic or oval lenticels. Leaves odd-pinnate, 12-25 cm. long, the petioles somewhat channeled above; leaflets 3-7, oblong-elliptic to elliptic, oblanceolate or obovate, 3.5-15 cm. long, 2-6 cm. broad, the terminal leaflet often larger, all acute or sometimes rounded at the apex, acute or cuneate at the base, glabrous on both sides, the veins prominent beneath; inflorescence umbel-like, lateral, axillary, the branches hirsute; flowers long-pedicelled, the pedicels dilated at the apex and jointed with the base of the calyx; calyx with 4 triangular acute lobes, petals usually 4, elliptic, 4.5-6.5 mm. long,

2.5–3 mm. broad, clothed on the back with appressed hairs; staminal tube lobed to the middle or below, the lobes hirsute; ovary hirsute; capsule ovoid, 1–1.5 cm. long, 7–9 mm. broad, hirsute; seeds ellipsoid or ovoid, 5.5–7 mm. long, 4–6 mm. broad. [*Pholacilia diversifolia* of Stahl, not of Grisebach; *Trichilia diversifolia* of Cook & Collins, not of Jussieu; *Trichilia simplicifolia* of Cook & Collins, not of Sprengel.]

Woodlands, forests, and valleys, Porto Rico, ascending to higher elevations:—Cuba; Hispaniola. CARACOLILLO. GAETA. RAMONCILLO.

3. *Trichilia hirta* L. Syst. ed. 10, 1020. 1759.

Trichilia spondioides Jacq. Enum. 20. 1760.

? *Trichilia Wawrana antillana* C. DC. in DC. Monog. Phan. 1: 667. 1878.

A tree, up to about 15 m. high, the gray bark scaly, the twigs more or less strigose. Leaves odd-pinnate, about 3 dm. long, the petioles and rachis often hirsute; leaflets 9–21, occasionally only 3 or 7, oblong-lanceolate or ovate-lanceolate, acute to acuminate at the apex, the tip obtuse, inequilateral and acutish or rounded at the base, tomentulose beneath or glabrous; inflorescence paniculate, the branches loosely hirsutulous to glabrous; flowers long-pedicelled; calyx-lobes triangular or triangular-ovate, glabrous or nearly so; petals oblong to elliptic or somewhat obovate, 5–6 mm. long, 2–2.5 mm. broad, glabrous, staminal tube lobed to below the middle, the lobes oblong, 2-toothed, villous within; anthers villous or glabrous; ovary pubescent, sessile on the disk; capsule globose or subglobose, 1–1.3 cm. broad, velutinous, occasionally with long scattered hairs intermingled. [*T. havanensis* of Cook & Collins, not of Linnaeus.]

Hillsides, thickets, river banks and arroyos at lower elevations, Porto Rico; Vieques; St. Thomas; St. Croix; St. Jan:—West Indies; continental tropical America. The stems of young trees are used for broom handles. CABO DE HACHA. GUAITA. RETAMO. JOBILLO. MOLINILLO. BROOMSTICK.

Trichilia moschata Sw., a tree native in Jamaica, was listed by Krebs from St. Thomas in error, unless, perhaps, it had been planted there.

Trichilia emarginata Krebs, listed from St. Thomas without description, has not been identified by subsequent botanists.

3. *GUAREA* Allamand; L. Mant. 150, 228. 1771.

Trees or shrubs, the leaves equally pinnate or rarely odd-pinnate. Leaflets opposite or alternate, entire, with or without slender elongate curved pellucid lines. Inflorescence axillary, or sometimes borne on the branches. Flowers perfect; calyx 4-lobed, the lobes imbricated or valvate, or of 5 distinct sepals. Staminal tube cylindrical or urn-shaped, entire or shallowly lobed. Disk obsolete or stipe-like. Ovary 4- or 5-celled. Ovules 1 or 2 in each cell, superposed. Fruit a 4–5-celled, 4–5-valved, coriaceous or woody capsule, loculicidally dehiscent from the apex. Seeds 1 or 2 in each cell; testa coriaceous or membranous; cotyledons fleshy; radicle lateral. [From Guara, the Cuban name.] About 90 species, mostly natives of tropical America, a few in tropical Africa. Type species: *Guarea trichilioides* L.

Leaflets 8–20, obscurely reticulate-veined; ovary pubescent with appressed hairs.

Leaflets 2–6; reticulate-veined on both sides; ovary glabrous.

1. *G. Guara*,
2. *G. ramiflora*,

1. *Guarea Guara* (Jacq.) P. Wilson, N. A. Fl. 25: 272. 1924.

Melia Guara Jacq. Enum. 20. 1760.

Trichilia Guara L. Sp. Pl. ed. 2, 551. 1762.

Guarea trichilioides L. Mant. 2: 228. 1771.

? *Triehilia quadrijuga* Spreng. Syst. 3: 67. 1826.

Guarea pauciflora Sessé & Moç. Fl. Mex. ed. 2, 92. 1894.

A tree, sometimes 20 m. or more tall. Leaves equally pinnate, 1-3 dm. long, the leaflets 8-20, elliptic to elliptic-lanceolate or somewhat obovate, 8-24 cm. long, 3-8 cm. broad, punctate with slender, often curved pellucid lines, usually short-acuminate at the apex, acute and equilateral at the base, glabrous on both sides, obscurely reticulate-veined; panicles 5-20 cm. high, the branches pubescent; flowers short-pedicelled; calyx-lobes half orbicular, entire or toothed, pubescent; petals oblong, 5-7.5 mm. long, 2-3 mm. broad, free, densely pubescent with short, closely-appressed hairs; staminal tube urn-shaped; glabrous or sometimes puberulent, entire or shallowly lobed; disk elevated; ovary ellipsoid or subglobose, closely sessile on the disk, pubescent with appressed hairs; capsule obovoid or globose-obovoid, 1.5-1.9 cm. in diameter, glabrous. [*Guarea Swartzii* of Stahl and of Cook and Collins.]

Woodlands, forests, river banks and arroyos at lower and middle elevations, mostly in moist districts, Porto Rico; recorded from St. Croix, perhaps in error.—Cuba; Hispaniola; continental tropical America. The reddish brown wood, used in carpentry, for wagons and implements, and in construction, is hard, strong, tough and durable. GUARAGUAO.

2. *Guarea ramiflora* Vent. Choix des Plantes 41. 1803.

Guarea humilis Bert.; DC. Prodr. 1: 624. 1824.

Shrub or small tree, rarely attaining a height of 20 m. Leaves equally pinnate, 4-17 cm. long, the leaflets 2-6, oblong to broadly elliptic or somewhat ovate, occasionally obovate, 7-22 cm. long, 3-8 cm. broad, punctate with numerous small pellucid dots, acuminate at the apex, acutish or somewhat rounded at the base, glabrous above, hirsute beneath on the midrib and lateral veins, reticulate-veined on both sides; panicles 3-9 cm. long, the branches hispidulous; calyx loosely hispidulous, the lobes broadly half triangular-orbicular, abruptly short-pointed; petals oblong, 6-8.5 mm. long, 2-4 mm. broad, adhering to the base of the staminal tube; staminal tube cylindric, glabrous, minutely papillose on the outside; disk elevated; ovary short-ovoid, glabrous; capsule more or less flattened and somewhat angled, the edges rounded, or occasionally 1-celled and subglobose, 1.7-2 cm. broad.

Forests and woodlands at middle and higher elevations in wet or moist districts of Porto Rico. Endemic. Its wood is similar to that of the preceding species. GUARAGUADILLO.

Guarea glabra Vahl, of the Lesser Antilles, is recorded by de Candolle as collected by Ryan on St. Croix prior to 1800. We have no evidence of its existence there at the present time.

4. **SWIETENIA** Jacq. Enum. 4, 20. 1760.

Evergreen trees, with hard reddish brown wood, and pinnate leaves with opposite acuminate leaflets, the small flowers in terminal and axillary panicles. Calyx 5-cleft, its lobes imbricated. Petals 5, spreading. Filaments united into an urn-shaped, 10-toothed tube; anthers 10. Disk saucer-shaped or shallowly cup-shaped, fluted on the outside, the margin crenate. Ovary 5-celled; stigma discoid, 5-rayed; ovules numerous in each cavity, pendulous. Capsule large, woody, 5-celled, septically 5-valved. Seeds many, imbricated in 2 series. [Named for Gerard von Swieten, 1700-1772.] About four species, natives of tropical regions, the following typical.

1. *Swietenia Mahagoni* Jacq. Enum. 20. 1760.

A medium size or large forest tree, buttressed at the base, the reddish bark scaly, the branches spreading, the angular twigs smooth. Leaves evenly pinnate, 1-2 dm. long, the slender petiole enlarged at the base; leaflets 4-10, coriaceous, ovate or ovate-lanceolate, inequilateral, 3-8 cm. long, dark green, glabrous and shining above, paler green and glabrous or sparingly pubescent beneath; panicles axillary, 6-15 cm. long; calyx-lobes rounded; petals white, spreading, about 4 mm. long; stamen tube glabrous; ovary ovoid; style erect; stigma 5-rayed; capsule ovoid, woody, 6-10 cm. long, splitting from the base into 5 thick valves, the 5-winged axis persistent; seeds 5-6 cm. long.

Abundant on hillsides and in valleys, at lower elevations, St. Croix; St. Thomas; apparently not an element of the original forests, however; it has occasionally been planted in Porto Rico; it is probably not native anywhere within the limits of our flora:—Florida; planted in Bermuda; Bahamas; Jamaica; Cuba; Hispaniola. The wood, one of the most valuable forest products of tropical America, esteemed for furniture and many other purposes, is brown, strong, hard and tough, with a specific gravity of about 0.7. Hon. Carlos E. Chardon has communicated to us an extract from the "Revista de Agricultura Industria y Comercio" of 1886, presumably written by Dr. Stahl, in which it is stated that the tree was introduced on St. Thomas but was not known to the writer to grow in Porto Rico. It occurs on several of the lesser Antilles, but is not certainly native on any of them. In 1793, West (Bidr. St. Croix 285) states that it was cultivated in a couple of gardens on St. Croix, but did not seem to thrive. CAOBA. MAHOGANY.

Swietenia Candollei Pittier, VENEZUELAN MAHOGANY, Venezuelan, experimentally planted for forestry purposes some years ago at the Agricultural Experiment Station at Mayaguez, and more recently at the Forest Station, Rio Piedras, Porto Rico, forms a large tree with wood similar to that of the West Indian Mahogany, its leaflets larger and less oblique, its fruit about 15 cm. long.

Swietenia macrophylla King, HONDURAS MAHOGANY, Central American, also planted for forestry purposes in Porto Rico, grows more rapidly than *S. Mahagoni* and has larger and broader leaflets and much larger fruit.

5. *CEDRELA* P. Br.; L. Syst. ed. 10, 940. 1759.

Large trees with light colored wood. Leaves equally pinnate, the leaflets many-paired, mostly opposite. Flowers perfect, in terminal or subterminal panicles. Calyx small, 4- or 5-lobed. Petals 4 or 5, erect, keeled to the middle or below on the midrib of the inner face, the keel adherent to the disk through the groove. Disk thick or elevated. Stamens 4-6, the filaments subulate, free, inserted above on the edge of the disk; anthers versatile. Ovary 5-celled, sessile on the top of the disk; style filiform; stigma discoid. Ovules pendulous, biseriate, 8-12 in each cell. Fruit a 5-celled, 5-valved coriaceous capsule, septically delhiscent from the apex to near the base. Seeds samaroid, imbricated downward in 2 rows in each cavity. Endosperm fleshy. Embryo straight. Cotyledons flat, subfoliaceous. [From *Cedrus*, the wood resembling that of that genus of conifers.] Twelve or more species, natives of tropical America. Type species: *Cedrela odorata* L.

1. *Cedrela odorata* L. Syst. ed. 10, 940. 1759.

Surenus Brownii Kuntze, Rev. Gen. Pl. 111. 1891.

Cedrela Sintonisii-C. DC. Ann. Cons. Jard. Bot. Geneve 10: 169. 1907.

A tree, sometimes 30 m. high, with a trunk up to nearly 2 m. in diameter, the gray bark fissured. Leaves up to 4 dm. long, the petioles and rachis glabrous; leaflets 10-16, rather firm in texture, oblong-ovate to obliquely ovate-lanceolate or obliquely ovate, 8-14.5 cm. long, 3-6 cm. broad, acuminate at the apex, rounded

and inequilateral at the base, short-petioled, glabrous; inflorescence 1.5–2 dm. or more high, its branches finely puberulent; flowers short-pedicelled; calyx puberulent, the lobes ciliolate, acute or occasionally rounded; petals rather thick, oblong, 5.5–6.5 mm. long, velvety puberulent; filaments glabrous, the anthers ovate; ovary glabrous, rather abruptly contracted into the slender style; capsule ellipsoid, 4–4.5 cm. long.

Forests, hillsides, river valleys and arroyos, Porto Rico; local and highly prized for its valuable wood:—Jamaica; continental tropical America. The reddish brown fragrant wood, now scarce, is used for cigar boxes, in carpentry, for furniture, and for various small articles; it is soft, durable and rather strong with a specific gravity of about 0.5. A highly desirable and available tree for reforestation. CEDRO. CEDRO HEMBRA. WEST INDIAN CEDAR. SPANISH CEDAR.

Family 11. POLYGALACEAE Rehb.

MILKWORT FAMILY.

Herbs, or sometimes shrubs or small trees in tropical regions. Stipules none. Pedicels generally 2-bracted at the base. Flowers perfect, irregular. Sepals 5, the two lateral inner ones (wings) large, colored, the others smaller. Petals 3 (or 5), hypogynous, more or less united into a tube, the lower (keel) often crested. Stamens generally 8, united in 1 or 2 sets. Ovary 2-celled; style simple; stigma curved, dilated or lobed; ovules 1 in each cavity, anatropous. Fruit mainly capsular. Seeds generally caruncled; embryo straight. About 10 genera and 1000 species, widely distributed.

Ovary 2-celled; fruit a capsule, sometimes winged.

Herbaceous plants.

Shrubs or trees.

Leaves many-veined, the veins nearly parallel; capsule winged on both sides.

Leaves few-veined; capsule coriaceous, winged only on one side.

Ovary 1-celled; fruit a samara; vines or elongated shrubs.

1. *Polygala*.

2. *Phlebotaenia*.

3. *Badiera*.

4. *Elsota*.

1. *POLYGALA* L. Sp. Pl. 701. 1753.

Herbs, annual or perennial. Flowers racemose, spicate or capitate, rarely solitary and axillary, sometimes also cleistogamous and subterranean. Sepals unequal, the two lateral ones (wings) large and petaloid. Petals 3, united into a tube which is split on the back, and more or less adnate to the stamens. Stamens 8 or 6, monadelphous below, or diadelphous; capsule membranous, compressed, dehiscent along the margin. Seeds 1 in each cavity, generally hairy. {Greek, much milk. A genus of about 450 species, of wide distribution. Type species: *Polygala vulgaris* L.

Keel blunt, without a beak or crest.

Keel beaked or crested.

Inflorescence narrowly racemose; seeds not silky-comose.

Annual, single-stemmed; racemes loose, slender.

Perennial, several-stemmed; racemes dense, stout.

Inflorescence glomerate, subglobose; seeds silky-comose.

1. *P. brizoides*.

2. *P. paniculata*.

3. *P. hecatantha*.

4. *P. longicaulis*.

1. *Polygala brizoides* St. Hil. Fl. Bras. Merid. 2: 44. 1829.

Polygala angustifolia H. B. K. Nov. Gen. 5: 405. 1821. Not Gilib. 1781.

Annual; pubescent; stems erect, simple or branched, about 3 dm. high, or less. Leaves lanceolate to linear, 1.5–4.5 cm. long, 2–9 mm. wide, 1-nerved, the apex acute or acuminate, the base narrowed; racemes few-several-flowered, 1.5–7 cm. long; pedicels 2–5 mm. long; flowers greenish purple; sepals narrowly ovate, obtuse, about 1.5 mm. long; wings obovate, inequilateral, cuneate, retuse, 3–4 mm. long; keel about 4 mm. long; blunt; capsule oval, about 3 mm. long; seed 2.5 mm. long.

Thickets, southern side of St. Thomas:—Cuba; Trinidad; Curaçao; continental tropical America.

2. *Polygala paniculata* L. Syst. ed. 10, 1154. 1759.

Annual; stems single, slender, usually branched, densely minutely glandular, 4 dm. high or less. Leaves linear or linear-spatulate, mucronate, 7–18 mm. long, usually less than 2.5 mm. wide, the lowest verticillate, the others alternate; racemes slender, loosely flowered, 2–10 cm. long; pedicels 1 mm. long or less; flowers rose, purple or white; sepals ovate, obtuse, about 1.3 mm. long; wings obovate, 2–2.5 mm. long; rounded, the base cuneate; keel about 2.5 mm. long, with a crest of 3 or 4 lobes on each side; capsule elliptic, nearly 2 mm. long; seed pubescent.

Grassy banks, hillsides and cultivated grounds, Porto Rico, at lower and middle elevations in moist districts:—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America. OROSNE.

3. *Polygala hecatantha* Urban, Symb. Ant. 1: 331. 1999.

Perennial by a woody root, glabrous; stems several or numerous, slender, nearly erect, about 6 dm. high or less, simple or with few branches. Leaves linear to linear-lanceolate, 1–2.5 cm. long, about 1.5 mm. wide, the lowest verticillate, the others alternate; racemes dense, nearly cylindrical, 2–4 cm. long or perhaps sometimes longer; pedicels only about 0.5 mm. long; flowers white; sepals oval, obtuse, about 1.5 mm. long; wings ovate, retuse, 3.5 mm. long; keel about as long as the wings, with a crest of lobes on each side; capsule about 3 mm. long; seed pilose, the aril 2-lobed.

Hillsides in the dry southwestern districts of Porto Rico; sand dunes on Anegada:—Hispaniola.

4. *Polygala longicaulis* H. B. K. Nov. Gen. 5: 396. 1821.

Polygala stelleri DC. Prodr. 1: 327. 1824.

Annual; stems simple or few-branched, erect or nearly so, glabrous or sparingly minutely glandular above, 2–6 dm. high. Leaves linear to lanceolate, 6–15 mm. long, 1–3 mm. wide, cuspidate, scattered and alternate or the lowest verticillate; inflorescence glomerate, subglobose; pedicels about 2 mm. long; flowers white to purple; sepals ovate, cuspidate, about 2 mm. long; wings elliptic, 4–5 mm. long, cuspidate, 3-nerved; keel about 5 mm. long, crested with 3 or 4 lobes on each side; capsule about 3 mm. long; seed silky, comose, about 2.5 mm. long. [*P. trichosperma* of Triana & Planchon, not of Linnaeus; *P. adenophora* of Bello, not of de Candolle; *P. variabilis* of Bello, not of Kunth.]

Sandy soil and grassy slopes, northern and western districts of Porto Rico:—Cuba; Hispaniola; Trinidad; continental tropical America.

2. **PHLEBOTAENIA** Griseb. Mem. Am. Acad. II. 8: 156. 1860.

Trees, with coriaceous leaves, their lateral veins numerous and nearly parallel, the showy purple flowers racemose or paniculate. Sepals unequal, free, deciduous, the 2 interior ones (wings) large. Petals 3, the 2 exterior distinct or adnate to the base of the stamen-tube. Stamens 8, their filaments united into a split sheath. Capsule large, compressed, broadly 2-winged on one side, narrowly 2-winged on the other. [Greek, referring to the leaf-venation.] Two known species, the following, and the typical *P. cuneata* of Cuba.

1. **Phlebotaenia Cowellii** Britton, Torreya 7: 38. 1907.

Phlebotaenia portoricensis Urban, Symb. Ant. 5: 382. 1908.

Polygala Cowellii Blake, Contr. Gray Herb. 47: 10. 1916.

A tree, up to 20 m. high, the trunk up to 2 dm. in diameter, the bark smooth and gray, the slender twigs puberulent. Leaves elliptic to ovate or elliptic-obovate, 5–12.5 cm. long, glabrous or the midvein with a few hairs, deciduous, the apex acute or short-acuminate, the base narrowed or rounded, the very many slender lateral veins straight, reticulate-anastomosing, the petioles 5–10 mm. long; flowers purple, in short racemes or panicles, appearing before the leaves of the season or before the leaves of the previous year have fallen; pedicels 4–10 mm. long; sepals elliptic, rounded, unequal, ciliolate, 2.5–4 cm. long; wings oblong-obovate, obtuse, about 15 mm. long; keel about as long as the wings, 3-lobed, with a rounded fold on each side; capsule flat, its larger membranous wings 2–3 cm. long.

Hillsides, woodlands and arroyos at lower elevations in the dry southern districts of Porto Rico, ascending to about 600 meters near Aibonito, and near Utuado. Endemic. PALO DE TORTUGA. CAROCLILLO. VIOLET TREE. One of the most elegant of trees when in flower in February or March, the leafless branches bearing innumerable flowers very conspicuous in the landscape. The wood is yellowish.

3. **BADIERA** DC. Prodr. 1: 334. 1824.

Evergreen shrubs or trees, with alternate entire subcoriaceous leaves, and small or minute greenish or white flowers in short axillary racemes. Sepals distinct, nearly equal, the two inner (wings) somewhat larger than the others, but not petal-like. Petals 3, the upper ones about twice as long as the wings, adnate to the stamen-tube at the base. Stamens 8, the filaments united into a tube. Ovary 2-celled, often pubescent. Capsule 2-celled, but one of the cells often abortive, coriaceous, margined, compressed. Seeds pubescent or nearly glabrous. [Dedicated to Badier, an early French botanical collector.] About 10 species, of the West Indies. Type species; *Polygala diversifolia* L.

Capsule ciliolate; flowers white.

1. *B. portoricensis*.

Capsule hispidulous; flowers greenish yellow.

2. *B. Penaea*.

1. **Badiera portoricensis** Britton, Bull. Torr. Club 42: 494. 1915.

Polygala portoricensis Blake, Contr. Gray Herb. 47: 14. 1916.

A tree, 4–6 m. high, the trunk up to 1.5 dm. in diameter, the branches virgate, the twigs hispidulous. Leaves obovate to elliptic-obovate, scabrous, 3 cm. long or less, the apex rounded or emarginate, the base cuneate, the petioles 1–2 mm. long; racemes 1 cm. long or less; pedicels 2–2.5 mm. long; flowers white; sepals ovate, nearly truncate, 1–1.3 mm. long; wings ovate, rounded, nearly 2 mm. long; keel about as long as the wings; capsule cuneate-quadrangle, broader than long, about 6 mm. long, notched, ciliolate, the sides nearly glabrous at maturity. [*B. domingensis* of Bello, not of de Candolle; *Polygala domingensis* of Urban, not of Jacquin.]

Hillsides and mountain slopes, vicinity of Mayaguez and Maricao. Endemic.

2. **Badiera Penaea** (L.) DC. Prodr. 1: 335. 1824.

Polygala Penaea L. Sp. Pl. 2: 703. 1753.

A shrub, or a small tree up to about 5 m. in height, the twigs hispidulous. Leaves obovate or oblong-obovate, scabrous, 1.5–3 cm. long, the apex obtuse or rounded, mucronulate, the base cuneate, the petioles 1.5 mm. long or less racemes 2–3 cm. long; pedicels 1–2 mm. long; flowers greenish yellow; sepals ovate, rounded, about 1 mm. long; wings ovate, obtuse, nearly 1.5 mm. long; keel 2.5–3 mm. long; capsule oblong to oblong-cuneate, notched or subtruncate, hispidulous, 4–5 mm. long, short-stipitate.

Dry limestone hills near Ponce and Guayanilla, Porto Rico; mountain thickets, Virgin Gorda;—Hispaniola.

4. **ELSOTA** Adans. Fam. Pl. 2: 358. 1763.

Woody vines, shrubs or trees, with alternate leaves, often with small stipular glands, the petioles short, the usually pink or purplish flowers in terminal and axillary racemes or panicles. Sepals 5, the 3 outer herbaceous, the two inner ones (wings) petal-like. Petals 3, the lower one (keel) convex, clawed, with a fimbriate crest, the two upper ones adnate to the base of the stamen-tube. Stamens 8, their filaments united into a split sheath. Ovary 1-celled; style curved; stigmas 2, the upper one tufted. Fruit a samara with a large wing, 1-seeded, the seed exarillate. [Name unexplained.] Twelve species or more, of tropical America. Type species: *Securidaca scandens* L.

Leaves oval, 7–20 mm. long.

Leaves ovate to oblong, 4–12 cm. long.

1. *E. virgata*.

2. *E. diversifolia*.

1. **Elsota virgata** (Sw.) Kuntze, Rev. Gen. Pl. 46. 1891.

Securidaca virgata Sw. Prodr. 104. 1788.

A branched, vine-like shrub, the slender, wand-like branches up to 7 m. long, spreading and arching, the twigs hispidulous or glabrous. Leaves scattered, oval, small, few-veined, 7–20 mm. long, hispidulous or strigillose, the apex rounded or emarginate, the base narrowed or obtuse, the petioles 1 mm. long or less; flowers showy, usually numerous, in slender, elongated, often paniced racemes, the slender pedicels 4–8 mm. long; outer sepals 2–4 mm. long, obtuse; wings suborbicular, pink or purple, 8–9.5 mm. broad; petals yellow; keel about 8 mm. long; samara 3–4 cm. long, the fruit-body reticulate-veined, the wing oblong-obovate, about 1 cm. wide near the middle.

Thickets, forests and arroyos at lower and middle elevations; Porto Rico; Vieques:—Cuba; Hispaniola. BEJUCO DE SOPLA. JABONCILLO.

2. **Elsota diversifolia** (L.) Blake, N. A. Fl. 25: 372. 1924.

Polygala diversifolia L. Sp. Pl. 703. 1753.

Securidaca erecta Jacq. Enum. 27. 1760.

A woody vine, trailing or high-climbing, the slender twigs finely puberulent. Leaves of the branches ovate to oblong, 4–12 cm. long, hispidulous or puberulent, the lateral veins 6–10 pairs, the apex acute or obtuse, the base narrowed or rounded, the petioles 2–7 mm. long; leaves of the twigs similar but much smaller, racemes slender, puberulent, 6–12 cm. long; pedicels 4–7 mm. long; outer sepals oval, 2.5–3.5 mm. long, the suborbicular, pink or purple wings 8–12 mm. broad; keel about 8 mm. long; samara 4–6 cm. long, the fruit-body reticulated, the wing narrowly obliquely obovate, 12–17 mm. wide about the middle. [*S. scandens* of West; ? *S. virgata* of Krebs.]

Thickets, St. Croix; St. Thomas:—Guadeloupe to Trinidad; Mexico to Ecuador.

Family 12. **EUPHORBIACEAE** J. St. Hil.

SPURGE FAMILY.

Monocious or dioecious herbs, shrubs or trees, with acrid, often milky sap. Leaves opposite, alternate or verticillate. Flowers sometimes much reduced and subtended by an involucre which resembles a calyx (*Euphorbiae*), the number of parts in the floral whorls often differing in the staminate and pistillate flowers. Ovary usually 3-celled; ovules 1 or 2 in each cavity, pendulous; styles mostly 3, simple, divided, or many-cleft. Fruit mostly a 3-lobed capsule, separating, often elastically, into 3, 2-valved carpels from a persistent axis. Seeds anatropous; embryo in fleshy or oily endosperm, the broad cotyledons almost filling the seed-coats. About 250 genera and over 4000 species, of wide distribution.

- A. Ovules 2 in each ovary-cavity.
1. Staminate flowers axillary, in short clusters or solitary.
 - a. Flowers, at least the staminate, petaliferous.
Disk of distinct glands.
 1. *Andrachne*.
 2. *Savia*.
 - b. Flowers apetalous.
 - *Fruit capsular or baccate; styles not dilated.
 - †Staminate flowers with a rudimentary ovary; spiny shrub or small tree.
 3. *Securinega*.
 - ††Staminate flowers without a rudimentary ovary; plants not spiny.
 - ‡Trees, shrubs or woody vines.
 - §Leaves normal.
 - Stamens 5-9; stigma sessile.
 4. *Asterandra*.
 - Stamens 2-4.
 - Staminate calyx 4-6-parted; stamens 3 or 2, the filaments more or less united.
 5. *Conami*.
 - Staminate calyx 4-parted; stamens 4, distinct.
 - Flowers in leafy-bracted panicles; fruit indehiscent.
 6. *Cicca*.
 - Flowers axillary; fruit capsular.
 7. *Margaritaria*.
 - §Leaves obsolete; branches flattened into cladophylls.
 8. *Xylophylla*.
 - ††Annual or perennial herbs; stamens mostly 3.
 9. *Phyllanthus*.
 - **Fruit drupaceous; styles dilated.
 10. *Drypetes*.
 11. *Hyeronima*.
 2. Staminate flowers in panicle racemes; leaves lepidote.

B. Ovule only 1 in each ovary-cavity.

 1. Flowers not in an involucre (See *Dalechampia*).
 - a. Filaments inflexed at the top.
 12. *Croton*.
 - b. Filaments straight.
 - *Flowers in forked cymes.
 - Calyx 5-toothed or 5-lobed.
 13. *Curcas*.
 - Petals coherent.
 14. *Adenoropium*.
 - Petals distinct.
 15. *Aleurites*.
 - Calyx irregularly rupturing.
 - **Flowers not in forked cymes.
 - †Lobes of the staminate calyx valvate.
 - ††Staminate flowers petaliferous.
 - Stamens 2-3-verticillate.
 - Staminate flowers with a rudimentary ovary.
 16. *Caperonia*.
 - Staminate flowers without a rudimentary ovary.
 17. *Ditaxis*.
 - Stamens 1-verticillate.
 18. *Argythamnia*.
 - †††Flowers of both kinds apetalous.
 - §Stamens few or many, distinct or united.
 - ¶Styles distinct, or connate only at the base.
 - ΔAnther-sacs globose to oblong.
 - Anthers 4-celled.
 19. *Adelia*.
 - Anthers 2-celled.
 - Anther-sacs pendulous or adnate.
 20. *Ricinella*.
 - Anther-sacs ascending, divaricate.
 - Staminate flowers without a rudimentary ovary.
 21. *Alchornea*.
 - Staminate flowers with a rudimentary ovary.
 22. *Alchorneopsis*.
 - ΔΔAnther-sacs elongated, often flexuous.
 23. *Acalypha*.
 - ¶¶Styles more or less united; our species vines.
 - Flowers without an involucre.
 24. *Tragia*.
 - Flowers subtended by a foliaceous involucre.
 25. *Dalechampia*.
 - §§Stamens very many, the filaments repeatedly forked.
 26. *Ricinus*.
 - †††Lobes of the staminate calyx imbricated or calyx wanting.
 - †Flowers in branched racemes.
 27. *Manihot*.
 - †††Flowers spicate, or in simple racemes.
 - §Bracts small, sometimes 2-glandular.
 - Calyx of the staminate flowers cleft or lobed (unknown in *Ditla*).
 - Styles 2-lobed.
 28. *Ditla*.
 - Styles not 2-lobed.
 29. *Sapium*.
 - Filaments distinct.
 30. *Hipponanea*.
 - Filaments connate.
 - Calyx of the staminate flowers none or rudimentary.
 31. *Gymnanthes*.
 - §§§Bracts large, membranous; tree with cordate leaves.
 32. *Hura*.
 2. Flowers in a more or less cyathiform involucre.
 - a. Involucre calceiform, the glands internal.
 33. *Pedilanthus*.
 - b. Involucre regular, the glands external.

- Plants fleshy, cactus-like, mostly leafless.
 Plants normally leafy.
 Glands of the involucre unappendaged.
 Glands of the involucre appendaged.
 Plants with jointed branches; leaves opposite or verticillate.
 Glands of the involucre transverse, 2-lipped, the lower lip appendaged; herbs.
 Glands of the involucre not transverse; shrubs or trees.
 Branches not jointed; mostly low herbs, with opposite, inequilateral leaves.
34. *Euphorbia*.
 35. *Poinsettia*.
 36. *Dichyllum*.
 37. *Aklema*.
 38. *Chamaesyce*.

1. **ANDRACHNE** L. Sp. Pl. 1014. 1753.

Herbs, or shrubby plants, with diffusely branching stems. Leaves alternate. Flowers monoecious, axillary, the staminate often clustered, with a 5-6-lobed calyx, 5 or 6 petals, and 5 or 6 stamens; pistillate flowers solitary, with a 5- or 6-lobed calyx, minute petals, or these wanting; styles 2-cleft or 2-parted; ovules 2 in each cavity. [From the Greek for *Portulaca*.] About 10 species, of wide distribution. Type species: *Andrachne T lephioides* L.

1. **Andrachne cuneifolia** Britton, Mem. Torr. Club 20: 72. 1920.

A glabrous shrub or small tree, 4 m. high or less, with slender, elongated leafy branches. Leaves obovate, cuneate, 5-15 mm. long, delicately pinnately veined, dark green and shining above, pale green and dull beneath, the apex rounded or subtruncate, the petiole about 1 mm. long; fruiting pedicels capillary, 12-20 mm. long, the 6 persistent, spreading or reflexed sepals about 1 mm. long; capsule glabrous, subglobose, about 3 mm. in diameter, dry, splitting; seeds obliquely oblong, 2.5-3 mm. long.

Hillsides and plains at low elevations in the dry southern and southwestern districts of Porto Rico:—Cuba. The staminate flowers are as yet unknown.

2. **SAVIA** Willd. Sp. Pl. 4: 771. 1806.

Trees or shrubs, with alternate stipulate leaves, the inflorescence racemose or short-cymose. Flowers petaliferous, dioecious or monoecious. Staminate flowers: sepals 5, subequal, imbricated; petals small; stamens 5, alternate with the petals; filaments separate above their insertion; anthers erect; rudimentary ovary slightly 3-fid. Calyx of the pistillate flowers as in the staminate. Capsule 3-celled, the cocci 2-valved; seeds exarillate; endosperm fleshy; cotyledons plane. [Commemorates Gattano Savi, professor at Pisa, died 1844.] About 6 West Indian species. Type species: *Croton sessiliflorum* Sw.

1. **Savia sessiliflora** (Sw.) Willd. Sp. Pl. 4: 771. 1806.

Croton sessiliflorum Sw. Prodr. 100. 1788.

A shrub, or a small tree up to about 8 m. high, with slender, pubescent twigs, the gray-brown bark striate-fissured. Leaves ovate to ovate-lanceolate, 4-8 cm. long, pale green, acuminate or acute at the apex, rounded or subcordate at the base, entire, chartaceous, reticulate-veined, glabrous, except the short petiole and the base of the midvein beneath; inflorescence axillary; staminate flowers about 1.5 mm. long, the pistillate larger; fruiting pedicels 3-8 mm. long; capsule greenish, about 10 mm. broad; seeds nearly 5 mm. long, smooth.

Banks, hills, thickets and woodlands, Porto Rico, at lower and middle elevations, mostly in dry districts; Desocheo; Vieques; St. Croix; St. Thomas; St. Jan:—Cuba; Hispaniola. Recorded from Jamaica.

3. **SECURINEGA** Comm.; Gmel. Syst. 1008. 1791.

Shrubs, the leaves alternate, entire, often small, the flowers clustered or solitary in the axils, monoecious or dioecious, apetalous. Staminate flowers: sepals 5, imbricate; lobes of the disk, or glands, 5, alternate with the stamens; stamens 5 or rarely fewer, filaments free, opposite the sepals; anthers erect, their cells distinct, longitudinally dehiscent; rudimentary ovary more or less evident, slightly or markedly 2-3-fid. Pistillate calyx like the staminate; disk subtire; ovary 3-celled; styles distinct, recurved, 2-fid; ovules 2 in each cell. [Greek, referring to the hard wood of the typical species.] About 8 species of tropical and subtropical distribution. Type species: *Securinea durissima* Gmel.

1. **Securinea Acidoton** (L.) Fawcett, Journ. Bot. 57: 68. 1919.

Adelia Acidoton L. Syst. ed. 10, 1298. 1759.

Flucggia Acidothamnus Griseb. Nachr. Gesell. Wiss. Goett. 1865: 164. 1865.

Securinea Acidothamnus Muell. Arg. in DC. Prodr. 15: 451. 1866.

An intricately much-branched shrub 3 m. high or less. Branches strongly flexuous, delicately and sharply spinous; stipules ovate-lanceolate, minute, caducous; leaves petiolate, broadly obovate, obtusely rotund, rigid, densely and prominently reticulate-veiny, pale beneath, 6-8 mm. long, 2-6 mm. broad; staminate flowers glomerate or fasciculate; pistillate flowers solitary; styles connate below, bifid, the branches broadly 2-3-lobed; fruit at first fleshy, obtusely trigonal; seeds smooth, pallid.

Dry hillsides, Coamo Springs, Porto Rico; Muertos; St. Croix; St. Thomas; Little St. James Island, St. Jan.—Jamaica; Cuba; Hispaniola.

4. **ASTERANDRA** Kl. in Erichs. Arch. 7: 200. 1841.

A small tree, with alternate distichous, oblong-lanceolate to ovate, entire, short-petioled leaves and small, solitary or fascicled, axillary monoecious apetalous, short-pedicelled flowers. Calyx-segments 5 or 6, nearly equal. Staminate flowers with 6 stamens, rarely fewer, their filaments connate. Pistillate flowers with a 3-celled ovary, the styles united, the stigma dilated, peltate. Fruit a 3-lobed, hard capsule, at length splitting. [Greek, a male star, referring to the stamens.] A few species of tropical America. Type species: *Phyllanthus cornifolius* H. B. K.

1. **Asterandra grandifolia** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 61. 1918.

Phyllanthus grandifolius L. Sp. Pl. 981. 1753.

Phyllanthus juglandifolius Willd. Suppl. 64. 1813.

Phyllanthus quinquifidus Sessé & Moc. Fl. Mex. ed. 2, 212. 1894.

Trunk slender, erect, horizontally branched, 2-8 m. high, the branches slender, glabrous or minutely puberulent, somewhat angled. Leaves chartaceous, 5-15 cm. long, glabrous, the apex acute, obtuse or acuminate, the base obtuse, rounded or subcordate; pedicels as long as the petioles or twice as long; calyx of the staminate flowers about 4 mm. long; capsule depressed, 10-12 mm. in diameter; seeds 5-6 mm. long. [*Savia laurifolia* of Bello, not of Grisebach.]

Thickets, wooded hills and river banks at lower and middle elevations, Porto Rico; St. Thomas (according to Urban).—Cuba; Hispaniola; Mexico; northern South America. JAGUEYILLO. TOBILLO.

Urban suggests (Symb. Ant. 4: 338) that the plant listed by Bello, without description, as *Phyllanthus nutans* (not *P. nutans* Sw.), and called JOBILLO, may be a lanceolate-leaved race of this species; it is known only from a drawing made by Krug.

5. **CONAMI** Aubl. Pl. Guian. 2: 926. 1775.

Shrubs or trees, mostly with distichous leaves, the small apetalous, mostly monoecious flowers clustered or solitary in the axils. Calyx 5-6-parted. Stamens mostly 3, the filaments more or less united. Ovules 2 in each ovary-cavity; styles slender, connate at the base. Fruit capsular. [Guiana name.] Twenty species or more, of tropical distribution. Type species: *Conami brasiliensis* Aubl.

1. **Conami portoricensis** (Kuntze) Britton.

Diasperus portoricensis Kuntze, Rev. Gen. Pl. 602. 1891.

Phyllanthus portoricensis Urban, Symb. Ant. 4: 338. 1905.

A glabrous, apparently dioecious shrub, 4 m. high or less, with weak slender branches. Stipules triangular-lanceolate, about 2 mm. long; leaves thin, obovate, 3-6 cm. long, obtuse or short-pointed, pinnately veined, the base cuneate, the slender petioles 5-10 mm. long; pedicels 2-4 mm. long, calyx greenish yellow; pistillate flowers about 1 mm. long, the sepals 5 or 6; styles 2-5-lobed, distinct; fruit globose, white, 6-7 mm. in diameter; seeds 3-angled, smooth.

Between Cayey and Guayama, Porto Rico, collected only by Dr. Otto Kuntze in 1874:—Jamaica (Hope Grounds; perhaps not native). We made careful search for this interesting plant in 1922 and 1923, along the whole of the road between Cayey and Guayama, but failed to find it. The type specimen is preserved in the herbarium of the New York Botanical Garden.

Conami Conami (Sw.) Britton [*Phyllanthus Conami* Sw.; *P. acuminatus* Vahl], a similar shrub or small tree, with ovate, acuminate leaves, the capsules about 4 mm. in diameter, is recorded by Mueller from St. Thomas, on the evidence of an old specimen in the Candolleian herbarium, but it is not known there at the present time. It inhabits Jamaica (where there is a Parish of St. Thomas); Cuba; Martinique; St. Vincent; Trinidad; and continental tropical America.

6. **CICCA** L. Mant. 1: 17, 124. 1767.

A tree with distichous entire leaves and small monoecious flowers in leafy-bracted lateral panicles. Calyx 4-parted, the segments unequal, imbricated. Petals none. Staminate flowers with 4 distinct stamens, the anthers extrorse. Pistillate flowers with a several-celled ovary, the styles 2-cleft; ovules 2 in each cell. Fruit baccate, indehiscent. Seeds angular, pendulous. [Greek, wonderful tree.] A monotypic genus.

1. **Cicca disticha** L. Mant. 1: 124. 1767.

Phyllanthus distichus Muell. Arg. in DC. Prodr. 15: 413. 1866.

A tree, up to 12 m. high, the hard wood nearly white. Leaves ovate, pointed, 5-7.5 cm. long. Flowers paniced, the panicles many-flowered, lateral, arranged along aphyllous branches, the male and female mixed in the same fascicles; filaments alternating with exterior glands; ovary 4-(3)-celled; fruit depressed-globose, angled, the angles as many as there are seeds; smooth.

Roadsides and waste grounds, Porto Rico, spontaneous after planting; St. Croix; St. Thomas; St. Jan; Tortola:—Widely planted for its fruit in tropical regions. Perhaps native of the East Indies. The wood is tough, strong and durable; the fruit is much used for preserves. CEREZA AMARILLA, GROSELLA. OTAHEITE GOOSEBERRY.

7. **MARGARITARIA** L.f. Suppl. 66, 428. 1781.

Trees, shrubs or woody vines, with glabrous alternate entire leaves, and small dioecious flowers, solitary or few together in the axils. Calyx usually 4-parted.

Disk urceolate. Staminate flowers usually with 4 distinct stamens. Pistillate flowers with a 3-5-celled ovary and 3-5 distinct styles; ovules 2 in each cavity. Fruit capsular, 3-5-lobed. Seeds angled, smooth. [Greek, pearl-like.] Four known species, of tropical and subtropical America. Type species: *Margaritaria nobilis* L.f.

1. **Margaritaria nobilis** L.f. Suppl. 428. 1781.

Cicca antillana A. Juss. Tent. Euph. 108. 1824.

Phyllanthus nobilis Muell. Arg. in DC. Prodr. 15²: 414. 1866.

Phyllanthus nobilis antillanus Muell. Arg. loc. cit. 415. 1866.

A tree, up to 14 m. high, the slender twigs glabrous, lenticillate, the wood white, hard and tough. Leaves thin, elliptic or oblong-elliptic, 4-15 cm. long, pinnately veined, short-petioled, rather bright green above, pale green beneath, the apex acute or acuminate, the base narrowed or obtuse; staminate flowers clustered, the 4 sepals about 1.5 mm. long, the 4 stamens about as long; pistillate flowers solitary or few together, long-pedicelled, the calyx 2 mm. long, the ovary 4-5-celled, the 4 or 5 styles united below with lobed or cleft stigmas; capsule subglobose, fleshy but at length dehiscent, about 8 mm. thick.

Thickets, hillsides and forests in wet or moist districts of Porto Rico, at lower and middle elevations; St. Croix (according to Eggers); St. Thomas; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; Guadeloupe to Grenada. HIGUILLO. MILLO. AVISPILLO. AMORTIGUADO. GONGLEHOUT. ROEHOUT.

8. **XYLOPHYLLA** L. Mant. 2: 147, 221. 1771.

Aphyllous tree-like shrubs, with flat leaf-like coriaceous branches (cladophylls). Male and female flowers mingled in glomerate or fasciculate clusters in the serratures of the cladophylls; calyx 5-6-parted; staminal column entire or divided, surrounded by as many glands as stamens; anthers transversely dehiscent; ovules 2 in each ovary-cavity; styles 3, depressed, lacinate or 2-cleft. Fruit capsular. Seedlings, and sometimes shoots from stumps, bear small normal leaves. [Greek, woody-leaf.] About 10 species of the West Indies and Brazil. the following typical.

1. **Xylophylla Epiphyllanthus** (L.) Britton; Small, Fl. Florida Keys 76. 1913.

Phyllanthus Epiphyllanthus L. Sp. Pl. ed. 2, 1392. 1763.

Phyllanthus falcatus Sw. Fl. Ind. Occ. 1115. 1800.

A shrub, 0.75-2 m. high. Cladophylls subcompressed, scattered or distichous, lanceolate to rhomboid, serrate above, 5-13 cm. long, 0.8-2 cm. broad; sepals red; staminal column entire or trifid; anthers sessile, spreading, the cells distinct, ovoid-globose; styles slender, recurved above, 2-4-fid; capsule sessile, subglobose, about 3 mm. in diameter.

Limestone hills and cliffs, northern districts and near Ponce, Porto Rico; St. Thomas (ex Krebs); Virgin Gorda:—West Indies. LENGUA DE VACA. HARDHEAD. SWORD-BUSH. BOXWOOD.

9. **PHYLLANTHUS** L. Sp. Pl. 981. 1753.

Annual or biennial herbs. Leaves alternate, entire, distichous, often so arranged as to appear like the leaflets of a compound leaf. Flowers monoecious, apetalous, a staminate and pistillate one often together in the axils. Calyx mostly 5- or 6-parted, the lobes or sepals imbricated. Stamens usually 3. Ovules

2 in each cavity; styles 3, each usually 2-cleft. [Greek, leaf-flower.] Over 50 species, of wide distribution. Type species: *Phyllanthus Niruri* L.

Herbaceous annuals.

Filaments distinct, or connate at the base; capsule 3 mm. broad. 1. *P. lathyroides*.

Filaments united into a column; capsule 2 mm. broad. 2. *P. Niruri*.

Perennials, the stems more or less woody.

Leaves elliptic or elliptic-obovate; stem branched above, elongated. 3. *P. diffusus*.

Leaves orbicular-obovate; stems much branched at the base, short. 4. *P. polycladus*.

1. *Phyllanthus lathyroides* H. B. K. Nov. Gen. 2: 110. 1817.

Annual; glabrous; herbaceous; stem erect or ascending, branched, 3-6 dm. high. Stipules linear-lanceolate; leaves elliptic, obtuse, 7-12 mm. long, pinnately veined, nearly sessile, pale beneath; pedicels 2-4 mm. long; calyx 2-3 mm. long; filaments distinct or connate at the base; style 2-parted; capsule about 3 mm. broad; seeds punctulate in longitudinal lines.

Grassy situations, roadsides and cultivated grounds in moist districts, Porto Rico; Guadeloupe; Martinique; Barbados; continental tropical America.

2. *Phyllanthus Niruri* L. Sp. Pl. 981. 1753.

Annual; herbaceous; stem erect, 6 dm. high or less, branched. Leaves 6-15 mm. long, subsessile, obovate-oblong, rounded at the apex or mucronate, glabrous, pale beneath; stipules setaceous; pedicels from 1-6 times exceeded by the leaf; calyx-segments ovate; anthers sessile on the top of the stamen column, globose, contiguous; styles short, included; capsule depressed-globose, 2 mm. broad; seeds evenly striated on the back.

Roadsides, banks, waste and cultivated grounds, Porto Rico; St. Croix; St. Thomas; Tortola;—Florida; Bermuda; West Indies; continental tropical America and Old World tropics. Often a troublesome weed. NIRURI. GALE OF WIND.

3. *Phyllanthus diffusus* Klotzsch; Seem. Bot. Herald 105. 1852-57.

Perennial; glabrous; stems somewhat woody, 3-4 dm. long, branched above, the branches very slender. Stipules subulate; leaves elliptic or elliptic-obovate, green on both sides, 3-7 mm. long, rounded, pinnately veined, nearly sessile; pedicels much shorter than the leaves; calyx 2-3 mm. long; stamens 2 or 3, the filaments connate; styles short, 2-cleft; capsule about 2 mm. broad; seeds longitudinally papillose-striolate.

Monte Cienega near Adjuntas, collected by Sintenis (according to Urban); incomplete specimens collected by Stevens and Hess at Jndiera Fria, near Maricao, may belong here, as also a specimen collected by Thompson on St. Croix;—Guadeloupe (according to Mueller); continental tropical America.

4. *Phyllanthus polycladus* Urban, Symb. Ant. 1: 333. 1899.

Perennial; glabrous, much branched from the base, the branches very slender, 15 cm. long or less. Stipules setaceous with a broader base; leaves orbicular-obovate, 3-5 mm. long, pale green, rounded, obscurely veined, short-petioled; pedicels very short; calyx of the staminate flowers scarcely 1 mm. long, that of the pistillate larger; stamens 2, with filaments connate to about the middle; styles 2-cleft; capsule about 1.5 mm. broad; seeds striate.

On limestone rocks in the dry southwestern districts of Porto Rico; Muertos; Icaos; Aneгада;—Cuba; Hispaniola.

Phyllanthus Emblica L., EMBLIC MYROBALAN, Asiatic, seen in the collections at the Agricultural Experiment Station, Mayaguez, is a small tree, perhaps generically distinct from the herbaceous species of *Phyllanthus*; its slender branches bear numerous linear 2-ranked leaves about 15 mm. long; the minute

greenish flowers are sessile in the axils; the globose fleshy fruits, 1–1.5 cm. in diameter, are used as a purgative medicine.

10. **DRYPETES** Vahl, *Eclog.* 3: 49. 1807.

Shrubs or trees. Leaves coriaceous or subcoriaceous, glabrous; stipules deciduous; flowers axillary, fasciculate, dioecious. Calyx 4–6-parted, its lobes imbricated. Petals none. Stamens 2–8, distinct; anthers ovoid, introrse. Ovary 2–1-celled, its cells 2-ovuled. Fruit drupaceous, usually monospermous by abortion. [Greek, a drupe.] About 10 species, of Florida, the West Indies and Brazil. Type species: *Drypetes glauca* Vahl.

Ovary 1-celled.

Leaves spinulose-serrate; drupe 2 cm. long.

Leaves entire or repand; drupe 8–18 mm. long.

Filaments much longer than the sepals; drupe obliquely

obovoid, 8–10 mm. long.

Filaments as long as the calyx; drupe oblong-obovoid, 12–18

mm. long.

Ovary 2-celled; filaments much longer than the sepals; drupe subglobose.

1. *D. ilicifolia*.

2. *D. alba*.

3. *D. glauca*.

4. *D. lateriflora*.

1. **Drypetes ilicifolia** Krug & Urban, *Bot. Jahrb.* 15: 352. 1892.

Gomphia ilicifolia Bello, *Anal. Soc. Exp. Hist. Nat.* 12: 130. Hyponym. 1883. Not DC.

A shrub, or a small tree up to about 8 m. high, the twigs and leaves glabrous. Leaves oblong or elliptic-oblong, coriaceous, 6–15 cm. long, coarsely spinulose-dentate, acute or acuminate, reticulate-veined on both sides, the petioles short; staminate flowers in axillary fascicles, the pedicels about 2 mm. long, the sepals 2.5–3 mm. long; the filaments not longer than the sepals; pistillate flowers as yet unknown; drupe obovoid, a little oblique, about 2 cm. long, 1-celled, the stigma sessile. [*Ilex* (?) of Stahl.]

Sand dunes and limestone hills, northern districts of Porto Rico. Endemic. Erroneously recorded from Jamaica. ENCINILLO.

2. **Drypetes alba** Poit. *Mém. Mus. Paris* 1: 157. 1815.

Guatteria Berteriana Spreng. *Syst.* 2: 635. 1825.

A tree, 10–20 m. high, glabrous, or the young twigs finely pubescent. Leaves ovate to lanceolate or ovate-elliptic, subcoriaceous, 5–12 cm. long, reticulate-veined beneath, entire or undulate, the apex acute or acuminate, the base narrowed or subcuneate and more or less oblique, the rather slender petioles 6–9 mm. long; staminate flowers yellow-green, numerous, somewhat shorter than the pedicels, or as long, the 3–6 stamens much longer than the sepals; ovary 1-celled; stigma 1; drupe obliquely obovoid, short-stalked, white, tomentulose, 8–10 mm. long.

Forests of Porto Rico in wet or moist districts:—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe. The wood, used for hubs and for charcoal, is yellowish, hard and tough, fine-grained and difficult to split. CAFEILLO. PALO DE VACA.

3. **Drypetes glauca** Vahl, *Eclog.* 3: 49. 1807.

A tree, up to 20 m. high, the bark nearly white, the young twigs puberulent. Leaves ovate-lanceolate to elliptic-lanceolate, subcoriaceous, entire or repand, 8–15 cm. long, glaucescent, reticulate-veined on both sides, acute or acuminate, the base narrowed or rounded, sometimes a little oblique, the petioles 10–16 mm. long; staminate flowers several or numerous on short, yellowish-tomentose pedicels, the sepals pubescent, about as long as the 6–8 stamens; pistillate flowers few or solitary, slender-pedicelled; ovary 1-celled; stigma 1, nearly terminal;

drupe nearly regularly oblong-obovoid, 12–18 mm. long, at length glabrous, its stalk about 2 cm. long.

Woodlands and forests in moist or wet districts, Porto Rico, mostly at higher elevations; St. Croix (according to Eggers):—Jamaica; Hispaniola; St. Kitts to St. Vincent. PALO BLANCO. VARITAL.

4. *Drypetes lateriflora* (Sw.) Krug & Urban, Bot. Jahrb. 15: 357. 1892.

Schaefferia lateriflora Sw. Prodr. 38. 1788.

A shrub, or sometimes a tree up to 13 m. high, the trunk sometimes 2.5 dm. thick. Leaves petiolate, oblong or elliptic, 5–11.5 cm. long, acute or short-acuminate at base and apex, entire or those of shoot from cut stumps spinulose-serrate, shining, delicately reticulate-veined beneath; flowers in dense, axillary clusters; pedicels shorter than the petioles; sepals oblong to ovate, about 2 mm. long, obtuse, pubescent without; stamens 3–5, longer than the sepals; ovary 2-celled; stigmas 2, nearly terminal, stipitate; drupe subglobose, 6–11 mm. in diameter, dark brown, tomentulose.

Wooded hills near Bayamon, Porto Rico.—Florida; Bahamas; Jamaica; Cuba; Hispaniola. The wood is heavy, dark brown, fine-grained, rather weak and brittle, with a specific gravity of about 0.9. GUIANA PLUM.

11. *HYERONIMA* Allem. Diss. 1848.

Trees, with alternate, pinnately veined, entire petioled lepidote leaves and small dioecious apetalous flowers in axillary panicles. Staminate flowers with a 3–6-toothed calyx, a cupulate disk and 2–5 stamens opposite the calyx-teeth. Pistillate flowers with calyx and disk similar to the staminate, the ovary 2-celled with 2 ovules in each cavity; styles usually 2, each 2-cleft. Fruit subglobose, small, somewhat fleshy, the endocarp hard, usually, containing a single seed. [Commemorates Jeronimo Serpa.] About 12 species, of tropical America. Type species: *Hyeronima alchorneoides* Allem.

1. *Hyeronima clusioides* (Tul.) Muell. Arg. Linnaea 34: 66. 1865.

Stilaginella clusioides Tul. Ann. Sci. Nat. III. 15: 245. 1851.

A tree, up to 20 m. in height, the twigs, leaves and inflorescence brownish-lepidote. Petioles rather stout, 1–6 cm. long; leaf-blades subcoriaceous, elliptic, obtuse or acute, 7–15 cm. long, sometimes pubescent on the veins beneath, the base narrowed or rounded, the upper side finely reticulate-veined; panicles 6–8 cm. long; staminate flowers less than 1 mm. long, the disk about half as long as the sepals; calyx of the pistillate flowers a little larger; fruit about 2 mm. long, the styles persistent. [*H. alchorneoides* of Grisebach and of Cook and Collins, not of Allem.]

Mountain forests in wet or moist districts, Porto Rico:—Dominica; St. Vincent; Grenada. CEDRO MACHO.

12. *CROTON* L. Sp. Pl. 1004. 1753.

Herbs, shrubs or trees, often strong-scented, and stellate-pubescent. Leaves mostly alternate, sometimes with two glands at the base of the blade. Flowers spicate or racemose. Staminate flowers uppermost; calyx 4–6-parted (usually 5-parted); petals usually present but small or rudimentary, alternating with glands; stamens 5 or more. Pistillate flowers; calyx 5–10-parted; petals usually wanting; ovary mostly 3-celled; ovule 1 in each cavity; styles once, twice or many times cleft. Fruit capsular. Seeds carunculate. [Greek name of the Castor-oil plant.] Over 600 species widely distributed. Type species: *Croton Tiglium* L.

A. Shrubs, or some species trees.

1. Leaves entire, or nearly so.

a. Plants erect.

*Leaves without stalked marginal glands.

Leaves silvery-lepidote beneath.

Leaves stellate-pubescent beneath, or glabrous.

Leaves densely stellate-pubescent beneath.

Leaves elongated-lanceolate.

Leaves oblong to ovate-lanceolate.

Mostly dioecious; leaves obtuse, mucronulate.

Monoecious; leaves obtuse, acute or acuminate.

Leaf-blades glandular at the base;

capsule subglobose, 5 mm. long.

Leaf-blades glandless; capsule

ellipsoid, 6-8 mm. long.

Leaves glabrous or loosely stellate beneath.

Stipules glandular; leaves obtuse.

Stipules not glandular.

Leaves 4-10 cm. long, acute.

Leaves 1-2 cm. long, obtuse.

*Leaves thin, ovate, stellate-pubescent, sometimes with stalked marginal glands.

b. Low, small-leaved shrub with prostrate branches.

2. Leaves crenate.

B. Herbaceous plants.

Leaves deeply lobed.

Leaves serrate.

1. *C. poccilanthus*.2. *C. impressus*.3. *C. discolor*.4. *C. rigidus*.5. *C. astroites*.6. *C. ovalifolius*.7. *C. lucidus*.8. *C. Fishlockii*.9. *C. humilis*.10. *C. nummulariaefolius*11. *C. betulinus*.12. *C. lobatus*.13. *C. glandulosus*.1. **Croton poccilanthus** Urban, Symb. Ant. 1: 334. 1899.

A tree, up to 12 m. high, the trunk 2-3 dm. in diameter, or sometimes shrubby, the bark smooth, the twigs, petioles, under leaf-surfaces and inflorescence densely brownish-lepidote. Leaves elliptic or elliptic-obovate, coriaceous, entire, 8-15 cm. long, pinnately veined, the apex acute, obtuse or abruptly short-acuminate, the base obtuse or nerved and 2-glandular, the upper surface glabrous, the stout petioles 4 cm. long or less; inflorescence simple or branched, usually many-flowered, 1-2.5 dm. long, wholly staminate, or with pistillate flowers at the base; staminate flowers white, with a 3-4-lobed calyx, 5 oblong petals 4-5 mm. long, and about 20 stamens as long as the petals; pistillate flowers with a calyx about 4 mm. long, the style-branches 10-12; capsule ovoid, 10-15 mm. long.

Mountain forests at middle and higher elevations in the eastern wet districts of Porto Rico. Endemic.

2. **Croton impressus** Urban, Symb. Ant. 1: 335. 1899.

An erect shrub, about 2 m. high, the twigs, petioles, under leaf-surfaces and inflorescence very densely and finely stellate-pubescent. Leaves elongated-lanceolate, chartaceous, pinnately many-veined, about 11 cm. long or less, 10-15 mm. wide, obtuse or acute, the base obtuse or subcordate, bearing a few small glands, the margin entire or slightly undulate, the petioles 1-2 cm. long, the veins impressed in the glabrous upper side; racemes spike-like, 3-5 cm. long; staminate flower: numerous, with distinct sepals nearly 2 mm. long, a little shorter than the ovate petals, the stamens about 16, with filaments 2.5 mm. long; pistillate flowers few at the base of the staminate, the styles 2-parted; capsule globose, 4-5 mm. in diameter.

Rio Estero, near Sabana Grande, and wooded valleys near Maricao, Porto Rico. Endemic.

3. **Croton discolor** Willd. Sp. Pl. 4: 532. 1805.

A shrub, about 2.5 m. high or less, erect or struggling, the twigs, petioles, under leaf-surfaces and inflorescence densely whitish or yellowish stellate-pubescent. Leaves oblong to oblong-orbicular, entire, pinnately veined, firm in texture, 2-4 cm. long, the apex rounded, mucronulate, the upper surface dark

green and glabrous, the petioles 5–25 mm. long; the base bearing 1 or few glands; plants commonly, but not always dioecious; staminate flowers in slender racemes, often longer than the leaves, the 5-parted calyx about 2.5 mm. long, the petals a little longer, the stamens about 15; pistillate flowers larger, with 3-parted styles; capsule globose, about 6 mm. long.

Hillsides and thickets at low elevations in the dry southwestern districts of Porto Rico: Mona; Vieques; Culebra; St. Croix; St. Thomas; Anegada.—Hispaniola. LECHECILLO. Erroneously recorded from the Bahamas.

4. *Croton rigidus* (Muell. Arg.) Britton.

Croton flavens rigidus Muell. Arg. in DC. Prodr. 15^o: 613. 1866.

An odorless shrub, 0.5–3 m. high, rarely a small tree, up to 4 m. high, the twigs, leaves and inflorescence densely stellate-tomentose. Stipules obsolete; leaves oblong to lanceolate or ovate, various in size and in length of the petioles, 2–10 cm. long, entire, obtuse, acute or acuminate, the rounded or narrowed base glanduliferous; racemes commonly as long as the leaves or longer, the pistillate flowers below the staminate; staminate flowers with a calyx 2–2.5 mm. long and 12–16 stamens; pistillate flowers larger, the styles 2-cleft; capsule subglobose, about 5 mm. long. [*C. balsamifer* of Bello and of Eggers, not of Jacquin; *C. tomentosus* of Sessé and Moçino, not of Link.]

Thickets and hillsides at low elevations, Porto Rico, mostly in dry districts; Culebra, Culebrita; Vieques; St. Croix; St. Thomas; St. Jan; Tortola, Virgin Gorda. Endemic. Consists of several races, differing in form and size of leaves, in pubescence and in color of twigs. ADRIMIDA. GUAYACANILLO. YELLOW BALSAM. SAGE. SOLDIER WHIP.

5. *Croton astroites* Dryand. in Ait. Hort. Kew 3: 375. 1789.

Croton phlomooides Pers. Syn. 2: 585. 1806.

Croton venosus Spreng. Neue Entd. 3: 24. 1822.

A shrub, up to about 3 m. high, or a small tree sometimes 6 m. high, the twigs, petioles, leaves and inflorescence densely stellate-pubescent. Stipules minute, subulate; leaves ovate-oblong to ovate-lanceolate, eglandular, 3–8 cm. long, entire, pinnately-veined, the apex acute or acuminate, the base 5–7-nerved, rounded or subcordate, the petioles 1–4 cm. long; inflorescence 2–6 cm. long, the staminate flowers above the pistillate; staminate flowers with a calyx about 3 mm. long and about 16 stamens; pistillate flowers with an accrescent calyx up to 8 mm. long, the styles 2–3-cleft; capsule ellipsoid, 3-lobed, about as long as the calyx.

Hillsides. Cabeza de San Juan, and roadside at Aguadilla, Porto Rico; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—St. Martin to Guadeloupe. MARAN.

6. *Croton ovalifolius* Vahl in West, Bidr. St. Croix. 307. 1793.

Croton diffusus Griseb. Crot. Mon. 41. 1807.

Oxydectes ovalifolia Kuntze, Rev. Gen. Pl. 612. 1891.

Shrubby, branched, slender, 5 dm. high or less, the branches, petioles and under leaf-surfaces pilose with long stellate hairs. Leaves oval, oblong or elliptic, slender-petioled, glandless, 1–3.5 cm. long, entire, or crenulate toward the rounded apex, the base mostly narrowed, the upper surface glabrous; stipules linear, glandular, small; staminate flowers with a calyx about 2 mm. long, the petals about as long, the stamens with pubescent filaments; pistillate flowers pedicelled at the base of the staminate, the glandular-fringed calyx-segments 4–6 mm. long, the styles 4–6-parted; capsule globose, a little shorter than the calyx.

Hillsides, St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Jamaica; Hispaniola; Guadeloupe; Margarita; Bonaire; Curaçao; Aruba; Venezuela; Colombia. YERBA.

7. ***Croton lucidus*** L. Syst. ed. 10, 1275. 1759.

Croton portoricensis Vahl; Steud. Nomen. ed. 2, 1: 447. 1840.

Croton Hookerianus Baill. Etud. 363. 1858.

Croton lucidus pubigrucus Griseb. Fl. Br. W. 1. 40. 1859.

Croton lucidus polytrichus Urban, Symb. Ant. 1: 335. 1890.

A shrub, 1.5–2 m. high; branchlets mostly glabrous or glabrescent. Leaves elliptic to oblong-lanceolate, 5–15 cm. long, 2–4 cm. wide, eglandular, glabrous or pubescent, minutely pellucid-punctate, entire, narrowing to a roundish base and apex; petiole about one-fourth the length of the blade; stipules ephemeral. Inflorescence in terminal racemes. Staminate flowers: sepals ovate, imbricated, much smaller than those of the pistillate, ciliate on the margin; pistillate flowers: calyx-lobes oblong, blunt, margin reduplicate, somewhat persistent at the base; styles 4-partite, the branches bifid to near the base.

Limestone hills, coastal woods and thickets in the dry southwestern districts, Porto Rico; Mona; Muertos:—Bahamas; Jamaica; Cuba; Hispaniola; Cayman Islands. FIRE-BUSH.

8. ***Croton Fishlockii*** Britton, *Torreyia* 20: 84. 1920.

A low, much branched shrub, the young twigs sparingly long-pilose, the internodes short. Leaves broadly elliptic to suborbicular, 6–22 mm. long, rounded or obtuse at both ends, pinnately few-veined, sparingly long-pilose and with copious black stellate hairs, the pilose petioles 2–8 mm. long; flowers few, in small terminal clusters, or solitary. Staminate flowers: sepals ovate to ovate-elliptic, about 3 mm. long, stellate-pubescent; petals obovate, 3 mm. long, villous within; stamens 12, the filaments villous near the base.

On the summit of the mountain, Virgin Gorda, about 400 m. altitude, collected only by Fishlock. Endemic.

9. ***Croton humilis*** L. Syst. ed. 10, 1276. 1759.

A usually much branched, aromatic shrub, 2 m. high or less, the slender twigs, the petioles, the inflorescence and under leaf-surfaces stellate-tomentose. Leaves thin, ovate or ovate-lanceolate, pinnately veined, 2–6 cm. long, entire, the margin sometimes with distant, stipitate glands, the apex acute or acuminate, the base rounded or subcordate, the slender petioles often nearly as long as the blade; stipules glandular-incised, or minute and glandular-lobed; racemes 2–4 cm. long; flowers white; staminate flowers with a calyx about 2.5 mm. long, the elliptic petals about as long, the stamens numerous; pistillate flowers at the base of the staminate, the calyx 4–5 mm. long, the styles 4-parted; capsule 3-lobed, 5–6 mm. long.

Thickets and hillsides, Porto Rico; in the dry southwestern districts near the coast; St. Thomas:—Jamaica; Hispaniola; Yucatan. Porto Rico specimens are mostly without marginal glands. YERBA BELLECA. PEPPER-BUSH.

10. ***Croton nummulariaefolius*** A. Rich; in Sagra, *Hist. Cub.* 11: 211. 1850.

Much branched from a deep woody root, the branches very slender, prostrate or ascending, somewhat woody, 1–3 dm. long, leafy, stellate-pubescent. Leaves suborbicular, very small, only 2–7 mm. broad, sometimes broader than long, entire or sparingly crenulate, stellate-pubescent on both sides, the petiole shorter than the blade; stipules ovate, minute, deciduous; raceme small, few-flowered; staminate flowers with about 6 stamens; calyx of the pistillate flowers about 2 mm. long; capsule subglobose, about 3 mm. long.

Rocky coastal thicket, Guanica, Porto Rico:—Cuba; Hispaniola.

11. ***Croton betulinus*** Vahl, *Symb.* 98. 1791.

A shrub, 0.5–3 m. high, the very slender twigs, the short petioles, the under leaf-surfaces and the inflorescence stellate-pubescent. Stipules minute or want-

ling; leaves small, 8–20 mm. long, ovate or ovate-lanceolate, rather coarsely crenate-dentate, the apex obtuse or acute, the base rounded or subcordate, the dark green upper surface scabrous-stellate; racemes as long as the leaves or longer, few–several-flowered; staminate flowers with a calyx about 1 mm. long and about 10 short stamens; pistillate flowers with a calyx 2–2.5 mm. long, the styles 2-parted with 2-lobed or 2-cleft divisions; capsule subglobose, about 3 mm. long.

Thickets along and near the coasts, Porto Rico; Mona; Muertos; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada.—Cuba; Hispaniola; Anguilla to Martinique.

12. **Croton lobatus** L. Sp. Pl. 1005. 1753.

Croton trilobatus Willd. Sp. Pl. 4: 556. 1805.

Oxydectes lobata Kuntze, Rev. Gen. Pl. 612. 1891.

A low herb, 3–6 dm. high, the branches and branchlets pilose, the longer hairs simple. Leaves membranous, 3–5-lobed, glabrous, papillate, the segments elliptic to elliptic-lanceolate, acuminate, serrate; petioles nearly as long as the blades. Pistillate flowers: calyx-lobes spatulate-lanceolate, glanduliferous and with a few long acicular hairs; styles free or nearly so, 3–8-fid at the apex. Staminate flowers; sepals glabrous; petals lanceolate. Capsule globose-ellipsoid, the cocci with a number of scattered acicular hairs; seeds ochre-color, quadrangular-cylindric, 5 mm. long, 3 mm. broad.

Waste and cultivated grounds, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola.—West Indies; continental tropical America.

13. **Croton glandulosus** L. Syst. ed. 10, 1275. 1759.

Croton affinis Vahl; Spreng. Syst. 3: 870. 1826.

Croton glandulosus glabratus Urban, Symb. Ant. 1: 336. 1899.

Herbaceous, annual, loosely stellate-pubescent or glabrate, erect or nearly so, branched, 8 dm. high or less. Leaves oblong to ovate, coarsely serrate, 2–7 cm. long, obtuse or acute, with 2 glands at the base of the blade; petioles slender, 1–2 cm. long; staminate flowers spicate, the calyx about 2 mm. long, the petals very small, the 8–10 stamens about as long as the calyx; pistillate flowers few or several at the base of the staminate, the styles 2-cleft; capsule subglobose, about 5 mm. long; seeds about 4 mm. long. [Included by Millspaugh in *C. trinitensis* Millsp.]

Sandy and gravelly soil at lower elevations, Porto Rico; St. Croix.—southeastern United States; Jamaica; Cuba; Hispaniola; continental tropical America north to Mexico.

Croton hastatus West, of St. Croix, listed by West without description, is not identified.

Croton corylifolius Lam., listed by Krebs from St. Thomas in 1851, is not otherwise reported within the limits of this Flora; his record is probably erroneous.

Croton buxoides Vahl, also listed by Krebs, is an unpublished name, not associated with any known species.

Eggers recorded an arboreal *Croton*, found on Flag Hill, St. Thomas, not in flower when observed by him.

13. **CURCAS** Adans. Fam. Pl. 2: 356. 1763.

Glabrous or nearly glabrous trees or shrubs with petioled, lobed or entire leaves, and monoecious flowers in compound or simple cymes. Calyx 5-lobed or

5-parted. Corolla gamopetalous, the petals united to or above the middle. Stamens about 10, in 2 series. Ovary 2-3-celled; ovules 1 in each cavity. Fruit a capsule, splitting into 2 or 3 valves. [Malabar name.] Perhaps 10 species, natives of tropical regions, the first following typical.

Cymes contracted; capsules 3-4 cm. long.

1. *C. Curcas*.

Cymes dichotomous; capsules about 1.5 cm. long.

2. *C. hernandifolius*.

1. **Curcas Curcas** (L.) Britton & Millspaugh, Bahama Fl. 225. 1920.

Jatropha Curcas L. Sp. Pl. 1006. 1753.

Curcas indica A. Rich; in Sagra, Hist Cub. 11: 208. 1850.

A small tree or sometimes shrubby, 2-5 m. high. Leaves subcordate, roundish, angular or obsoletely 3-5-lobed, glabrous or glabrate, the petiole about as long as the blade; stipules deciduous; inflorescence in contracted cymes; calyx 5-partite; corolla yellow, 5-partite, villous within, twice as long as the calyx; stamens 10-15; styles bifid, cohering below; capsules oval, slightly fleshy, 3-4 cm. long; seeds oblong, nearly 2 cm. long.

Hillsides, waste ground and woodlands, Porto Rico, at lower and middle elevations; often planted and spontaneous after cultivation; St. Croix; St. Thomas; St. Jan.—Bermuda; West Indies and continental tropical America. The seeds are used medicinally. TARTAGO. PHYSIC-NUT.

2. **Curcas hernandifolius** (Vent.) Britton.

Jatropha hernandifolia Vent. Jard. Malm. 1: 52. 1803.

Louriera peltata Desf. Cat. Hort. Paris ed. 3, 411. 1829.

Curcas peltata Baill. Etud. Euph. 315. 1858.

Curcas portoricensis Baill. Etud. Euph. 314. 1858.

Jatropha portoricensis Millsp. Field Mus. Bot. 2: 59. 1900.

Jatropha hernandifolia portoricensis Urban, Symb. Ant. 4: 349. 1905.

Jatropha hernandifolia peltata Pax, Pflr. 42: 75. 1910.

A glabrous shrub, 2-4 m. high, the twigs rather slender. Petioles slender, 2-7 cm. long; leaf-blades thin, peltate or epeltate, 4-10 cm. long, palmately veined, entire or 3-lobed, glaucous beneath, the apex acute or acuminate, the base rounded or cordate; stipules subulate; cymes dichotomously compound, the branches very slender; sepals ovate, obtuse, about 3 mm. long; petals white, obtuse, coherent to about the middle, 5-6 mm. long; stigma 2-parted; capsule ellipsoid, about 1.5 cm. long, rugulose; seeds compressed, about 1 cm. long, finely mottled. [*Jatropha heterophylla* of Sessé and Moçino, not of Steudel.]

Hillsides and thickets at lower elevations, Porto Rico, mostly near or along the coasts.—Jamaica; Hispaniola.

14. **ADENOROPHIUM** Pohl, Pl. Bras. 1: 12. 1827.

Monoecious or rarely dioecious perennial herbs, or shrubs, with entire lobed or divided leaves, the flowers in cymes. Staminate flowers on the upper parts of the cymes, with a corolla-like 5-lobed calyx, 5 distinct petals, the stamens usually several or numerous. Pistillate flowers in the lower-forks of the cymes. Capsule ovoid or subglobose, easily separating into 2-valved carpels. [Greek, glandular bush.] Eighty species or more of tropical and subtropical distribution. Type species: *Adenoropium ellipticum* Pohl.

Herbaceous; petioles glandular; leaves 3-5-lobed.

1. *A. gossypifolium*.

Shrub or small tree, glabrous throughout; leaves palmately several-many-parted.

2. *A. multifidum*.

1. **Adenoropium gossypifolium** (L.) Pohl, Pl. Bras. 1: 16. 1827.*Jatropha gossypifolia* L. Sp. Pl. 1006. 1753.

Herbaceous; stem 6–10 dm. high, branched. Leaves ciliate or glanduliferous on the margin, 3–5-partite or 3–5-lobed, petioled, pubescent, glabrescent beneath or glabrous, the segments ovate, pointed, denticulate or entire; petiolar and stipular glands branched; inflorescence in contracted cymes; corolla twice as long as the calyx; petals obovate, deep purple, spreading; stamens 8–12; stigmas 2-branched; capsule truncate at both ends, 3-sulcate, about 1 cm. in diameter.

Fields, hillsides, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Desecheo; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; West Indies; continental tropical America. TUA-TUA. HIGUERITA CIMARRONA.

2. **Adenoropium multifidum** (L.) Pohl, Pl. Bras. 1: 16. 1827.*Jatropha multifida* L. Sp. Pl. 1066. 1753.

A glabrous shrub or small tree up to 6 m. high, the branches stout. Stipules setaceous-dissected, 1–2 cm. long; leaves long-petioled, nearly orbicular in outline, deeply several-many-parted, 1.5–3 dm. in diameter, the lobes pinnately incised or entire, long-acuminate, green above, white-glaucous beneath; cymes long-stalked, compound, compactly many-flowered; flowers scarlet; sepals ovate; petals 4–7 mm. long, spatulate; capsule subglobose, yellow, 2–3 cm. long.

Occasionally spontaneous after cultivation, in Porto Rico, perhaps native in the southwestern districts; much planted for ornament; roadsides, St. Croix; St. Thomas:—West Indies; continental tropical America, introduced by planting in the Old World tropics. DON TOMAS. TARTAGO EMETICO. MANA. CORAL PLANT. CORAL BUSH.

Adenoropium hastatum (Jacq.) Britton & Wilson, Cuban, grown for ornament in Porto Rico and Virgin Island gardens, is a glabrous or puberulent shrub, the leaves various, ovate to obovate, entire, dentate, lobed or panduriform, the rose-colored flowers in terminal, long-peduncled cymes, with petals 11–15 mm. long. [*Jatropha hastata* Jacq.; *J. pandurifolia* Andr.]

15. **ALEURITES** Forst. Char. Gen. 111. 1776.

Trees, with large, 3–5-lobed or entire, 5–7-nerved, petioled leaves, and mostly monoecious, petaliferous flowers in terminal paniced cymes. Calyx nearly globular, splitting into 2 or 3 lobes. Petals narrow, longer than the calyx. Staminate flowers numerous, with several or many stamens. Pistillate flowers mostly solitary in the forks of the cymules, the ovary 2–5-celled, the styles 2–5, each 2-divided; ovules solitary in the ovary-cavities. Fruit large, fleshy, edible, indehiscent. Seeds ecarunculate, with hard endosperm. [Greek, like meal.] Four known species of the Old World tropics, the following typical.

1. **Aleurites moluccana** (L.) Willd. Sp. Pl. 4: 500. 1805.*Jatropha moluccana* L. Sp. Pl. 1006. 1753.*Aleurites triloba* Forst. Char. Gen. 112. 1776.*Camirium moluccanum* Kuntze, Rev. Gen. Pl. 595. 1891.

A tree, up to 20 m. high, the gray-brown bark shallowly fissured, the stout twigs and inflorescence densely stellate-scurfy, the wood light yellow, weak and soft. Leaf-blades various, sharply 3–5-lobed or entire, ovate to suborbicular, 8–25 cm. long, stellate-pubescent beneath, the base subtruncate; petioles rather stout, mostly as long as the blades or longer; panicles many-flowered, 8–15 cm. long, scurfy-stellate; petals white, about 8 mm. long; fruit greenish, subglobose, a little wider than long, 4–6 cm. thick; seeds 1 or 2.

Sparingly spontaneous after cultivation, yielding a valuable oil, Porto Rico; St. Croix; St. Thomas:—widely planted and locally spontaneous in the West Indies. Native of the East Indian region. NUEZ DE INDIA. OTAHEITE WALNUT. CANDLE-NUT.



16. **CAPERONIA** St. Hil. Hist. Pl. Rem. 244. 1824.

Annual or perennial herbs, with alternate stipulate leaves, the small bracteolate, mostly monoecious, petaliferous flowers in axillary spikes or narrow racemes, the pistillate below the staminate. Staminate flowers with 5 or 6 valvate calyx-segments and about 10 stamens. Pistillate flowers with 5 or 6 imbricated sepals, the ovary 3-celled, the short styles fimbriate; ovules 1 in each ovary-cavity. Capsule muricate or spinulose, dry, splitting. Seeds ecarunculate. [Commemorates Caperon, a French pharmacist.] About 30 species of tropical America and Africa. Type species: *Croton castaneifolius* L.

1. **Caperonia palustris** (L.) St. Hil. Hist. Pl. Rem. 245. 1824.

Croton palustris L. Sp. Pl. 1004. 1753.

Annual; stem erect, branched, setulose-hispid and usually glandular at least above, 4-10 dm. high. Leaves linear, lanceolate, ovate or elliptic-ovate, pinnately veined, serrate, glabrate or pubescent on the veins beneath, 4-12 cm. long, the apex acute, obtuse or rounded, the petioles 5-20 mm. long; spikes 4-10 cm. long, very slender; staminate flowers usually many, with lanceolate segments about 1 mm. long; pistillate flowers usually few, larger than the staminate, with obovate, acuminate sepals, the styles 3-8-parted; capsule muricate, 6-7 mm. broad; seeds minutely foveolate. [*C. castaneifolia* of Bello, not of St. Hillaire.]

Wet grounds at lower elevations, Porto Rico:—Cuba; Hispaniola; Guadeloupe; Martinique; Tobago; Trinidad; continental tropical America. Recorded by Krebs as found in St. Thomas prior to 1851.

17. **DITAXIS** Vahl; Juss. Euphorb. 27, 110. 1824.

Monoecious or dioecious perennial herbs, or shrubs. Leaves alternate, often strongly nerved. Flowers racemed or solitary, usually bracted. Staminate flowers often crowded at the ends of the racemes; calyx 4- or 5-lobed, the lobes or sepals valvate; petals 4 or 5, alternate with the calyx-lobes and with the lobes of the disk; stamens of the same number as the petals or two or three times as many, united into a column. Pistillate flowers with the calyx-lobes or sepals imbricated and smaller petals, the ovary 3-celled. Capsule 3-lobed, depressed. Seeds ecarunculate, sometimes crested. [Greek, double-ranked, in allusion to the stamens.] About 40 species, natives of temperate and tropical regions, the following typical.

1. **Ditaxis fasciculata** Vahl; A. Juss. Tent. Euph. 110. 1824.

Argyrothamnia fasciculata Muell. Arg. Linnaea 34: 146. 1865.

An erect shrub, 0.5-1.5 m. high, with nearly white bark, branched, the branches stiff, glabrous, the young twigs sparingly pilose. Leaves oblong-ob-lanceolate to spatulate, 1-3 cm. long, entire, nearly sessile, glabrous or nearly so, the apex rounded, obtuse or emarginate, the base narrowed, 3-nerved, both surfaces reticulate-veined; racemes few-flowered, much shorter than the leaves, or flowers, solitary, bright white; sepals 5, pilose, lanceolate, those of staminate flowers about 3 mm. long, those of pistillate flowers 4-5 mm. long; stamens 10, in 2 series, with a few short staminodes; styles 2-cleft, pilose; capsule 5-6 mm. broad, pilose.

Hillsides and thickets at lower elevations, Porto Rico, in the dry southern and south-western districts; Muertos; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—St. Martin. Recorded by Mueller and by Pax from Cuba.

18. **ARGYTHAMNIA** Sw. Prodr. 39. 1788.

Low monoecious shrubs containing purple pigment. Leaves simple, entire or dentate, stipulate. Inflorescence in few-flowered, axillary subsessile racemes; flowers greenish, short-pedicellate, the 1-3 inferior pistillate. Calyx 4- or 5-parted, valvate. Petals of staminate flowers 4 or 5; stamens 4 or 5, cohering at the very base and surrounding a central rudiment, anthers subglobose, introrse; discal glands 4 or 5. Pistillate flowers with or without petal; styles cut into 3-8 branches. Capsule 3-coccos. [Greek, silvery bush.] About 8 species, of the West Indies. Type species: *Argythamnia candicans* Sw.

Leaves, at least the upper, acute; both staminate and pistillate flowers petaliferous.

Leaves rounded or obtuse; pistillate flowers apetalous.

1. *A. candicans*.
2. *A. Stahlii*.

1. **Argythamnia candicans** Sw. Prodr. 39. 1788.

A shrub, up to 1.5 m. high, usually lower and often straggling or nearly prostrate, the slender branches glabrous, gray. Leaves purplish or green, lanceolate to ovate-oblong, distantly denticulate, 2-8 cm. long, appressed-pubescent at least beneath, acute, acuminate or the lower obtuse, the base narrowed, 3-5-nerved, the petioles 1-3 mm. long; stipules about 1.5 mm. long; racemes 8-10 mm. long, with 1-5 pistillate flowers at the base; staminate flowers with 4 sepals about 2 mm. long and 4 obovate shorter petals; pistillate flowers with 5 sepals 2.5 mm. long and 5 much shorter petals; capsule villous, 5-6 mm. long.

Sandy and rocky soil at lower elevations, Porto Rico, in moist and dry districts; Mona; Icaos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Jamaica; Cuba; Hispaniola; St. Martin; St. Barts.

2. **Argythamnia Stahlia** Urban, Symb. Ant. 1: 336. 1899.

A low shrub, with slender, sometimes prostrate branches about 3 dm. long or shorter, the twigs appressed-pubescent. Leaves ovate to elliptic, 1.5-3.5 cm. long, entire, sparingly pubescent, the apex obtuse or rounded, the base narrowed, the petioles 4 mm. long or less; stipules about 1 mm. long; racemes few-several-flowered, about 5 mm. long, usually with only 1 pistillate flower; staminate flowers with 4 elliptic sepals about 1 mm. long and 4 broad petals of about the same length; pistillate flower with 5 oblong or lanceolate sepals 1.5-2 mm. long, the petals wanting; capsule 3-4 mm. long, pilose.

Woodlands and thickets, dry southwestern districts of Porto Rico; Anegada. Endemic.

19. **ADELIA** L. Syst. ed. 10, 1298. 1759.

[**BERNARDIA** P. Br. Hist. Jam. 361. Hyponym. 1756.]

Shrubs with serrate stipulate leaves pubescent with simple hairs, and dioecious flowers. Staminate flowers in axillary amentaceous spikes, each flower sessile in the axil of a bract; calyx 3-5-parted; stamens 15-20, distinct, the interior central and mixed with some glands; anthers cruciate-globose, 4-celled, 2 cells anterior. Pistillate flowers few or solitary, subterminal, 3-bracteate; calyx 5- or 6-parted, biseriate; styles 3, short, lacerate-crenate. [Greek, referring to the inconspicuous flowers.] A few species of tropical America, the following typical.

1. **Adelia Bernardia** L. Syst. ed. 10, 1298. 1759.

Croton dichotomus Willd. Sp. Pl. 4: 537. 1805.

Bernardia carpinifolia Griseb. Fl. Br. W. I. 45. 1859.

Bernardia dichotoma Mull. Arg. *Linnaea* **34**: 172. 1865.

Bernardia Bernardia Millsp. *Field Mus. Bot.* **2**: 58. 1900.

A tomentose shrub .75-3 m. high. Leaves petioled, ovate-oblong, 4-8 cm. long, rounded at the biglandular base, tapering from the middle to a bluntish point, obtusely serrate, tomentose beneath, primary veins distant, prominulous beneath; stipules setaceous, 2 mm. long. Staminate spikes sessile, 6-12 mm. long, tomentose; bracts oval, acute; calyx-lobes 3-5, ovate, acute, nearly equalling the stamens; central disk minute; anthers yellow. Capsule densely appressed-pubescent; seed ovate, acute, about 5 mm. long, nearly smooth, brown with darker brown markings.

Hillsides and thickets in the dry southern and southwestern districts of Porto Rico:—Bahamas; Jamaica; Cuba; Cayman Islands; Hispaniola; St. Vincent.

20. **RICINELLA** Muell. Arg. *Linnaea* **34**: 153. 1865.

Dioecious, apetalous shrubs or small trees, the branches mostly spinescent, the leaves alternate or fascicled on short twigs, entire, pellucid-punctulate. Flowers borne on lateral pulvini. Staminate flowers densely clustered, very short pedicelled, the calyx valvately 4- or 5-parted, the 8-17 stamens more or less connate, the disk annular. Pistillate flowers solitary or several together, long-pedicelled, with 5-7, narrow reflexed sepals, the ovary 3-celled, the 3 styles distinct, lacinate; ovules 1 in each ovary-cavity. Fruit a 3-lobed, dehiscent, pubescent capsule. Seeds ecarunculate. [Diminutive of *Ricinus*.] About 10 species of tropical America, the following typical.

1. **Ricinella Ricinella** (L.) Britton; P. Wilson, *Bull. N. Y. Bot. Gard.* **8**: 395. 1917.

Adelia Ricinella L. *Syst. ed.* 10, 1298. 1759.

Ricinella pedunculosa Muell. Arg. *Linnaea* **34**: 153. 1865.

A shrub, or a tree up to 10 m. high, the twigs slender, glabrous, the bark nearly white, many of the branchlets usually bearing spines 2 cm. long or less. Leaves membranous, oblong to obovate, 1-7 cm. long glabrous above, pubescent in the axils of the veins beneath, the petioles 1-5 mm. long, the apex obtuse, rounded or acutish, the base narrowed; staminate flowers with pedicels about as long as the calyx, the sepals 2-3 mm. long, the 8-15 stamens borne on a central knob; pistillate flowers on pedicels 1-5 cm. long, the sepals about 3 mm. long, the ovary tomentose; capsule deeply 3 lobed, 6-8 mm. in diameter; seeds brown, globose.

Hillsides and thickets, Porto Rico, at lower and middle elevations, mostly in dry districts; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda:—Jamaica; Cuba; Hispaniola; St. Martin; Grenada; Curaçao. ESPINILLO. ESCAMBRON. RICINELLA.

21. **ALCHORNEA** Sw. *Prodr.* 98. 1788.

Trees or shrubs, with alternate petioled stipulate 3-5-nerved leaves and dioecious or monoecious small, greenish or yellowish, apetalous flowers in lateral or axillary spikes or narrow racemes, the staminate spikes often paniced, the pistillate simple. Staminate flowers several together in the axils of small bracts, with a globose calyx valvately parting into 2-5 segments and about 8 stamens, the filaments connate below. Pistillate flowers 1-3 in the axils of bracts, the 3-6 sepals imbricated, the ovary 2- or 3-celled, the 2 or 3 styles simple or rarely 2-lobed at the apex; ovules 1 in each ovary-cavity. Capsule dry, splitting. Seeds ecarunculate. [Commemorates Alchorn, an English botanist.] About 45 species, of tropical regions, the following typical.

1. *Alchornea latifolia* Sw. Prodr. 6, 98. 1788.

A tree, up to 20 m. high, glabrate, or the young twigs and leaves minutely stellate-pubescent, the wood soft. Leaves subcoriaceous, the petioles rather stout, 4–12 cm. long, the blades ovate to broadly elliptic, 8–25 cm. long, dentate with gland-tipped teeth, the apex short-acuminate or obtuse, the base obtuse or subcordate, 2–4-glandular, 3-nerved, the lateral veins few; spikes slender, 6–20 cm. long, the staminate paniced, the pistillate simple; staminate flowers about 3 mm. in diameter; pistillate flowers in drooping spikes 10–16 cm. long, with simple styles 1–2 cm. long, connate below; capsule about 10 mm. in diameter; seeds 5–6 mm. in diameter, echinate.

Forests and wooded hills in wet or moist districts, Porto Rico, ascending to at least 700 m.; Tortola:—Jamaica; Cuba; Hispaniola; Mexico and Central America. ACHITILLO. PALO DE COTORRA.

22. *ALCHORNEOPSIS* Muell. Arg. *Linnaea* 34: 156. 1865.

Dioecious trees with glabrous foliage, alternate petioled, entire or undulate, 3-nerved leaves, the small flowers in simple, slender, axillary spikes. Staminate flowers solitary or clustered, the calyx globose, splitting into 3 or 4 valvate segments; stamens usually 6, the filaments distinct. Pistillate flowers few or several in the spikes, with 4 sepals, the ovary 3-celled, the 3 styles short, simple; ovules 1 in each ovary-cavity. Capsule dry, splitting. Seeds ecarunculate, reticulated. [Greek, resembling *Alchornea*.] Two known species, the following and the typical *A. floribunda* Muell. Arg.

1. *Alchorneopsis portoricensis* Urban, *Symb. Ant.* 1: 337. 1899.

A tree, up to about 15 m. high, the young twigs puberulent. Leaves chartaceous, glabrous, elliptic to obovate-elliptic, 5–10 cm. long, or those of shoots larger, undulate, slender-petioled, the apex short-acuminate, the base obtuse or narrowed, both sides reticulate-veined; spikes 3–6 cm. long, puberulent; staminate flowers 1–4 together, with 3 or 4, ovate puberulent segments about 1.5 mm. long and 5–8 stamens; capsule about 5 mm. in diameter; seeds 3 mm. long, lenticular.

Mountain forests of Porto Rico at higher elevations:—Hispaniola. PALO DE GALLINA. Perhaps not specifically distinct from *A. floribunda* of northern South America.

23. *ACALYPHA* L. Sp. Pl. 1003. 1753.

Monocious or dioecious herbs or shrubs. Stems mostly erect. Leaves alternate, stipulate. Flowers in spikes or spike-like racemes; staminate clusters often peduncled, each flower in the axil of a minute bractlet, with a 4-parted calyx and 8–16 stamens united at their bases. Pistillate flowers subtended by a foliaceous bract, which often equals or overtops the staminate, the calyx 3–5-parted; petals wanting in both kinds of flowers. Capsule usually of 3, 2-valved carpels, each 1-seeded. [Greek, nettle.] About 250 species, mostly tropical and subtropical. Type species: *Acalypha virginica* L.

Herbaceous annuals.

Inflorescence densely cylindric.

Inflorescence narrowly spicate.

Bracts of pistillate flowers cleft to the base.

Bracts of pistillate flowers cleft to about the middle

Shrubs or perennial herbs.

Low perennial herb, much branched from the base, the branches somewhat woody.

Erect shrubs.

Leaves lanceolate or oblong-lanceolate.

Leaves ovate.

Leaves long-petioled; tall shrub.

Leaves short-petioled; low shrub.

1. *A. alopecoidea*.

2. *A. setosa*.

3. *A. ostryaefolia*.

4. *A. chamaedrifolia*.

5. *A. portoricensis*.

6. *A. bisetosa*.

7. *A. Berteroana*.

1. *Acalypha alopecuroidea* Jacq. Ic. Rar. 3: 19. 1793.

Herbaceous, annual, 1-3 dm. high. Leaves broadly ovate, 5-7 cm. long, appressed-pubescent, membranous, flaccid, truncate or slightly cordate at the base, 5-nerved, cuspidate-acuminate, serrate, the petiole as long as the blade or longer; spikes cylindrical, closely flowered, 5 cm. long; bracts of the pistillate flowers membranous, ovate-triangular, 7-9 mm. long, 3-5-lacerate to the base; calyx-lobes ovate, acute; ovary hirsute above; styles elongated, delicate, attenuate, entire or shortly bifid; carpels slightly keeled; seeds ovoid, apiculate, 1 mm. long, reddish-brown.

Waste grounds, Palo Seco, Porto Rico (*J. A. Stenerson*, 1914);—Bermuda; Bahamas; Jamaica; Cuba; Trinidad; Mexico and continental tropical America.

2. *Acalypha setosa* A. Rich. in Sagra, Hist. Cuba 11: 204. 1850.

Ricinocarpus setosus Kuntze, Rev. Gen. Pl. 618. 1891.

An erect annual, 3-6 dm. tall, the younger parts pubescent. Leaves ovate, thin, 3-5-nerved, 4-7 cm. long, the base obtuse or slightly cordate, apex short-acuminate, margin finely serrate; inflorescence monoecious, in cylindrical spikes, the staminate axillary, lax-flowered, the pistillate terminal, dense-flowered, 3-5 cm. long; bracts of the pistillate flowers ovate, 5-6 mm. long, 7-13-partite, the divisions laciniate; calyx-lobes ovate-lanceolate, ciliate; styles short, thick, 2-6-laciniate above; seeds reddish-brown, ovoid-globose, apiculate, 1.5 mm. long; testa densely punctate.

Waste and cultivated grounds, Porto Rico, at lower and middle elevations:—Bahamas; Cuba; Hispaniola; St. Lucia; Mexico to Costa Rica.

3. *Acalypha ostryaefolia* Ridd. Syn. Fl. W. States 33. 1835.

Acalypha caroliniana Ell. Bot. S. C. & Ga. 2: 645. 1824. Not Walt. 1788.

Acalypha persimilis Muell. Arg. Linnaea 34: 25. 1865.

Ricinocarpus persimilis Kuntze, Rev. Gen. Pl. 618. 1891.

An erect, rather stout annual, minutely pubescent, 2-8 dm. tall. Leaves thin or membranous, ovate, 5-10 cm. long, base obtuse or cordate, apex short-acuminate, margin closely and sharply serrate; petiole often as long as the blade; inflorescence spiciform, the staminate axillary, the pistillate terminal; bracts of the pistillate flowers lobed; capsule depressed, short; seeds reddish-brown, ovoid-globose, apiculate, the testa warty-wrinkled. [*A. setosa* of Bello, not of Richard; *A. polystachya* of Grisebach, not of Jacquin.]

Fields, waste and cultivated grounds at lower elevations, Porto Rico; St. Thomas (according to Eggers);—southeastern United States to Mexico; Bahamas; Jamaica; Cuba.

4. *Acalypha chamaedrifolia* (Lam.) Muell. Arg. in DC. Prodr. 15²: 879. 1866.

Croton chamaedrifolius Lam. Encycl. 2: 215. 1786.

Acalypha reptans Sw. Prodr. 99. 1788.

Ricinocarpus chamaedrifolius Kuntze, Rev. Gen. Pl. 617. 1891.

A suffrutescent perennial, much branched from the base, the branches pubescent or glabrate, 1-3 dm. long. Leaves ovate, 1-3.5 cm. long, the base blunt or rounded, apex acute, margin crenate-dentate; petioles about one-third the length of the blades; inflorescence in cylindrical terminal subsessile androgynous racemes, sometimes with similar superaxillary racemes; bracts roundish, dentate or crenate, the teeth ovate, seeds ovate-globose, apiculate, brown, about 3 mm. long; testa very minutely pitted.

Banks, rocky places, hillsides and cultivated grounds, Porto Rico, at lower elevations; St. Croix; St. Thomas; Tortola;—Florida; Bahamas; Jamaica (?); Cuba; Hispaniola; Guadeloupe.

5. **Acalypha portoricensis** Muell. Arg. *Linnaea* **34**: 22. 1865.

Ricinocarpus portoricensis Kuntze, Rev. Gen. Pl. 618. 1891.

An erect monoecious shrub, about 2 m. high or less, the twigs and petioles softly pubescent. Leaves lanceolate, thin, 5-12 cm. long, 1-5 cm. wide, 5-7-nerved and pinnately veined, serrate, the apex acute or acuminate, the base rounded or subcordate, pubescent or glabrate, the petioles 1-5 cm. long; spikes 4-7 cm. long, the staminate axillary; bracts of the pistillate flowers 11-13-incised, 5-6 mm. long; staminate spikes slender.

Thickets, forests and rocky stream-banks, Porto Rico; at lower and middle elevations, mostly in relatively dry districts:—St. Croix. Endemic.

6. **Acalypha bisetosa** Bert.; Spreng. Syst. **3**: 879. 1826.

Ricinocarpus bisetosus Kuntze, Rev. Gen. Pl. 616. 1891.

An erect, dioecious, or perhaps monoecious, shrub, 1-5 m. high, the twigs and leaves more or less pubescent. Leaves ovate or oblong-ovate, thin, serrate, 5-7-nerved and pinnately veined, 6-12 cm. long, the apex acuminate, the base rounded or subcordate, the slender petioles 2-7 cm. long; pistillate inflorescence elongated, slender, described as 10-15 cm. long, the bracts dentate; staminate spikes 4-7 cm. long, slender. [*A. cuspidata* of Grisebach, in part, not of Jacquin; recorded by Kuntze as *Ricinocarpus hernandifolius*.]

Wooded hills, forests and banks of streams in wet or moist districts of Porto Rico, ascending to higher elevations. Endemic.

7. **Acalypha Berteroana** Muell. Arg. *Linnaea* **34**: 33. 1865.

Ricinocarpus Berteroanus Kuntze, Rev. Gen. Pl. 617. 1891.

Shrubby, softly pubescent all over. Leaves ovate to ovate-lanceolate, 3-4.5 cm. long, membranous, serrate, the apex bluntly acuminate, the base obtuse or subcordate, the petioles 5-8 mm. long; spikes axillary, small, sessile; bracts of the pistillate flowers lobed and dentate, 3 mm. long, about twice as wide as long, the calyx with ovate, ciliate teeth; style 12-14-laciniate.

Maritime thickets, Porto Rico, collected by Bertero; bank above Guayama at 250 m. altitude. Perhaps a short-leaved race of *A. portoricensis*. Endemic.

Acalypha Wilkesiana Muell. Arg., PRIMAVERA, JACOB'S-COAT, native of Pacific Ocean islands, planted for ornament in Porto Rico and the Virgin Islands, is a shrub 3 m. high or less, with ovate, nearly glabrous, variously colored leaves 1-2 dm. long, the slender staminate spikes nearly as long as the upper leaves, the pistillate shorter.

Acalypha hispida Burm. f., CHENILLE PLANT, PHILIPPINE MEDUSA PLANT, East Indian, a tall shrub with large ovate toothed leaves and red drooping spikes 1.5-2.5 dm. long, is planted for ornament in Porto Rico gardens.

24. **TRAGIA** [Plumier] L. Sp. Pl. 980. 1753.

Monoecious herbs or shrubs, sometimes climbing, usually armed with stiff stinging hairs. Leaves alternate, mostly cordate; flowers in racemes, bracteolate, apetalous; staminate flowers with a 3-5-parted calyx and 1-3 or rarely numerous stamens; pistillate flowers with 3-8-lobed calyx, the segments entire or pinnatifid, and 3 styles, often united to above the middle. Capsule 3-lobed, separating into 3, 2-valved carpels. [From *Tragus*, the Latin name of Hieronymus Bock, 1498-1553, a German botanist.] Over 100 species, mostly natives of tropical regions, the following typical.

1. *Tragia volubilis* L. Sp. Pl. 980. 1753.

A slender perennial twining vine 1–4 m. long, the stems, leaves and capsules pilose with stinging hairs. Leaves oblong to oblong-lanceolate or ovate, thin, crenate or serrate, 2–6 cm. long, the apex acute or obtuse, the base rounded or cordate, the slender petioles as long as the blades or shorter; stipules about 3 mm. long; racemes slender, 3–7 cm. long, the bracts lanceolate, persistent, 1–1.5 mm. long; staminate flowers several or numerous, short-pedicelled, their sepals 3; pistillate flowers on elongating pedicels which are jointed near the upper end, their sepals 6; capsule 6–7 mm. broad, hispid, deeply 3-lobed. [*T. ostryaefolia* of Millspaugh, not of Michaux.]

Thickets, banks and hillsides at lower elevations, in dry or moist districts, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies (except Bahamas); continental tropical America; western tropical Africa. PRINGA-MOSA. STINGING-VINE.

Tragia angustifolia L., recorded by Krebs from St. Thomas, has not been identified; Linnaeus did not publish any species under that name.

Tragia infesta Mart., also listed by Krebs, is an obscure Brazilian species.

25. **DALECHAMPIA** [Plumier] L. Sp. Pl. 1054. 1753.

More or less woody, monoecious, twining vines, with alternate stipulate petioled, often 3–5-lobed leaves, the inflorescence axillary, short-racemose or subcapitate, usually involucrate by 2 large bracts, the lower or outer flowers pistillate, the inner or upper ones staminate, both kinds apetalous. Staminate flowers with a globose, 4–6-parted calyx and numerous stamens. Pistillate flowers with a 5–12-parted calyx, the segments lacinate or rarely entire; ovary 3- or 4-celled; styles united into a column; ovules 1 in each ovary-cavity. Capsule 3- or 4-lobed or angled, splitting into 2-valved cocci. [Commemorates J. Dalechamps, 1513–1588, French physician and pharmacologist.] Sixty species or more, of tropical distribution, the following typical.

1. *Dalechampia scandens* L. Sp. Pl. 1054. 1753.

A slender pubescent subherbaceous vine, up to 3 m. long or longer. Leaves slender-petioled, deeply 3-lobed, rarely 5-lobed, 6–12 cm. broad, thin, the lobes acute or acuminate, denticulate, the middle one oblong to obovate, the lateral ones obliquely ovate; peduncles slender, about as long as the petioles, or shorter; stipules ovate to linear-lanceolate; involucre bracts broad, about 2 cm. long, 3-cleft, the lobes acute or acuminate; segments of the pistillate calyx pectinate and setose, nearly 1 cm. long in fruit; capsule smooth, about 4 mm. long.

Thickets at lower elevations, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Cuba; Hispaniola; St. Kitts to Trinidad; continental tropical America.

26. **RICINUS** L. Sp. Pl. 1007. 1753.

A tall stout monoecious herb, glabrous and glaucous, with alternate large peltate palmately lobed leaves, and numerous small apetalous greenish flowers in terminal racemes, the pistillate above the staminate. Staminate flowers with a 3–5-parted calyx, the segments valvate, and numerous crowded stamens; filaments repeatedly branched. Pistillate flowers with a caducous calyx. Capsule subglobose, or oval, separating into 3, 2-valved carpels. Endosperm fleshy and oily. [Latin name of the plant.] A monotypic genus.

1. **Ricinus communis** L. Sp. Pl. 1007. 1753.

Stem erect, 1–5 m. tall, more or less branched, often becoming tree-like with a stout trunk. Leaves nearly orbicular in outline, 1–6 dm. broad, 6–11-palmately lobed, the lobes toothed, acute or acuminate; capsule 12–16 mm. in diameter, usually spiny; seeds shining, smooth, black, variegated with white, or mottled with gray and brown markings.

Waste and cultivated grounds, spontaneous after cultivation, Porto Rico; Icacos; St. Croix; St. Thomas; St. Jan; Tortola:—southeastern United States; Bermuda; West Indies; continental tropical America and Old World tropics. Native of the Old World, much cultivated for its seeds, the source of castor-oil. HIGUERITO. CASTOR-OIL PLANT.

27. **MANIHOT** Adans. Fam. Pl. 2: 356. 1763.

Monoeocious herbs or shrubs of vigorous growth, generally with glaucous glabrous leaves. Leaves alternate, the blades entire or palmately 3–7-lobed, the segments membranous or leathery, entire or lobed. Flowers apetalous, in branched racemes, the staminate with a calyx of 5 partially united sepals; stamens 10, in 2 series; filaments slender, those of the inner series attached to the lobes of the disk; anthers opening lengthwise. Pistillate flowers with a calyx similar to that of the staminate but the tube often shorter; ovary 3-celled; styles 3, slightly united at the base; ovules solitary in each cell. Capsule 3-celled; seeds solitary in each carpel. [Name Brazilian.] About 80 species of South America, the following typical.

1. **Manihot Manihot** (L.) Cockerell, Bull. Torr. Club 19: 95. 1892.

Jatropha Manihot L. Sp. Pl. 1007. 1753.

Herbaceous; stems 0.8–1.5 m. high, more or less branched. Leaves 3–7-parted, the segments linear to elliptic or slightly broadest above the middle, acute or acuminate, entire; petiole about as long as the blade or longer; bracts shorter than the pedicels; calyx campanulate, 6–8 mm. long, its lobes ovate, obtuse, about as long as the tube; calyx of the pistillate flowers with a shorter tube than that of the staminate. [*M. Cassava* of Cook and Collins.]

Waste and cultivated grounds, Porto Rico, occasionally spontaneous after cultivation for its large starchy roots; St. Croix; St. Thomas; St. Jan; Tortola:—widely cultivated for food in all tropical and subtropical regions; native of continental tropical America. YUCA. CASSAVA.

Manihot dichotoma Ule, Brazilian, a plant yielding india-rubber, was grown experimentally at the Insular Agricultural Experiment Station at Rio Piedras, in 1923.

28. **DITTA** Griseb. Mem. Am. Acad. II. 8: 160. 1860.

A resinous, dioecious shrub or small tree, with alternate coriaceous oblanceolate, pinnately veined, glandular-denticulate or nearly entire leaves, the pistillate flowers sessile, solitary or geminate in the axils, the staminate as yet unknown. Pistillate flowers with a minute or obsolete calyx; petals none; ovary 2-celled with a single ovule in each cavity; styles 2, short, thick, deeply 2-lobed. Fruit subglobose, 2-celled, coriaceous. Seeds roughened. [Name Latin, referring to the styles.] A monotypic genus.

1. **Ditta myricoides** Griseb. Mem. Am. Acad. II. 8: 160. 1860.

A glabrous small tree, 4 m. high or less, or a shrub, the twigs and branches slender. Leaves 6.5 cm. long or less, 7–20 mm. wide, reticulate-veined, shining,

dark green above, pale green beneath, the marginal glands small, sometimes obsolete, the apex acute or blunt, the base cuneate, the petioles 2-6 mm. long; fruit reddish, about 5 mm. in diameter, the pericarp subcrustaceous; style-divisions about 1 mm. long; seeds subglobose, tuberculate.

Rocky river-bank, Rio Prieto, Sierra de Naguabo, collected by Shafer in 1914:—Cuba; Hispaniola.

29. **SAPIUM** P. Br.; Jacq. Stirp. Am. 249. 1763.

Glabrous, milky trees and shrubs, with alternate petioled, entire or denticulate leaves, often with 2 glands at the upper end of the petiole, the small greenish monoecious flowers spicate or racemose, the staminate above the pistillate or the two kinds in separate spikes or racemes. Staminate flowers about 3 together in the axils of bracts, with a very small 2- or 3-toothed calyx and 2 or 3 stamens with distinct filaments. Pistillate flowers solitary in the axils of bracts, the calyx 3-lobed or 3-cleft, the ovary 2- or 3-celled, the styles 2 or 3, distinct or united below. Fruit a fleshy capsule, at length splitting into 2 or 3 cocci. Seeds ecarunculate. [Named for the milky sap.] Ninety or more tropical species. Type species: *Sapium aucuparium* Jacq.

1. **Sapium Laurocerasus** Desf. Cat. Hort. Paris ed. 3, 411. 1829.

Excoecaria Laurocerasus Muell. Arg. in DC. Prodr. 15²: 1202. 1866.

A monoecious (or dioecious?) tree, up to 18 m., the bark smooth, the twigs rather stout. Leaf-blades elliptic to oblong, 5-20 cm. long, entire, short-acuminate or sometimes rounded at the apex, the base rounded or acute, the midvein prominent beneath, the lateral veins very many, slender, transverse; petioles slender, 1-4 cm. long, with two sessile glands just below the base of the blade; staminate and pistillate flowers in separate clusters, the staminate clusters 5-6 cm. long, the pistillate shorter, few-flowered; capsules about 8 mm. long, short-stalked; seeds triangular-convex, white. [*S. aucuparium* of Bello, not of Jacquin; (?) *Excoecaria Laurocerasus buxifolia* of Eggers.]

Forests and wooded hills in wet or moist districts, Porto Rico, mostly at middle and higher elevations; recorded by Eggers as occurring in forests at Cinnamon Bay, St. Jan, but not seen in flower. Endemic. LECHESILLO. HINCHA-HUEVOS. TABELBA. MILK-TREE.

30. **HIPPOMANE** L. Sp. Pl. 1191. 1753.

Trees with glabrous leaves and acrid poisonous milky juice. Leaves alternate, coriaceous, with rather long petioles. Flowers in terminal monoecious amentaceous spikes, the rachis stout, the male above the female in clusters of 8-15, subtended by 2-glandular bracts; calyx membranous, 2-3-lobed; stamens 2 or 3, exserted; filaments more or less united; anthers erect, extrorse. Pistillate flowers: calyx ovoid, 3-parted, closely surrounding the ovary and furnished with several glands; ovary 6-8-celled, sessile; styles 6-8, recurved, stigmatic on the inner surface; ovules 1 in each cell, pendulous, anatropous. Drupe slightly 6-8-ridged, variegated, the pulp milky, the endocarp bony, 6-8-celled; seeds elongated, flattened. [Greek, horse-poison.] A monotypic genus.

1. **Hippomane mancinella** L. Sp. Pl. 1191. 1753.

An evergreen tree, 4-20 m. high, the rather thick bark fissured. Leaves shining, glabrous, thickish, ovate or oval, 4-10 cm. long, blunt or somewhat narrowed at the base, acute or short-acuminate, undulate or slightly shallow-

serrate; principal veins at nearly right angles to the midrib; veinlets delicately reticulate; petioles slender, somewhat shorter, or at times longer, than the blades; stipules 4–8 mm. long; bracts broader than long, crenulate; calyx of the staminate flowers with 3 unequal acute lobes, that of the pistillate of ovate or orbicular sepals; drupe spheroidal when fresh, 2.5–3.5 cm. in diameter, yellowish; nut depressed, often bearing numerous grouped thorn-like projections.

Coastal woods, banks and thickets, Porto Rico; Desecheo; Mona; Icacos; Culebra; Vieques; St. Croix; St. Thomas; Virgin Gorda.—Florida; West Indies; Mexico and continental tropical America. The milky sap is poisonous to most people, being especially irritating to the eyes and mouth. The wood is fine-grained, brown, hard, strong and durable, used for furniture and in construction; it has a specific gravity of about 0.5. MANZANILLO. MANCHIONEEL.

31. **GYMNANTHES** Sw. Prodr. 95. 1788.

Evergreen trees or shrubs with glabrous leaves and milky juice, the leaves alternate. Flowers monoecious or rarely dioecious, the staminate in slender axillary bracteolate racemes, the pistillate solitary, long-peduncled, arising from the axil with the staminate; perianth rudimentary or lacking. Stamens 2 or 3; filaments distinct or united at the base, subtended by the rudimentary perianth of 3 scale-like parts. Styles 3, recurved. Capsule 3-carpelled; seeds pendulous, the testa membrano-crustaceous. [Greek, naked flower.] About 12 species, of tropical America. Type species: *Gymnanthes elliptica* Sw.

1. **Gymnanthes lucida** Sw. Prodr. 96. 1788.

Excoecaria lucida Sw. Fl. Ind. Occ. 2: 1122. 1800.

An evergreen shrub, or a tree often 10 m. high. Leaves petioled, glabrous, coriaceous, oblong or lanceolate-spatulate, 5–11 cm. long, narrowed at the base, shining above, the margin undulate and generally obscurely toothed near the apex; racemes shorter than the leaves, continuous; bracts reniform; stamens 2 or 3, subtended by bractlets; pistillate flowers solitary on curved peduncles somewhat shorter than the staminate racemes; ovary stipitate; capsule depressed, about 1 cm. broad; carpels rounded; seeds ovoid, about 5 mm. long, gray, striped longitudinally with fine golden-brown lines of irregular width and form.

Thickets, woodlands and hillsides at lower and middle elevations; Porto Rico; Desecheo; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda.—Florida; West Indies, south to Guadeloupe. The brown wood is hard, a little heavier than water. YAPI. CRABWOOD.

32. **HURA** L. Sp. Pl. 1008. 1753.

Large glabrous trees with milky juice, and large many-carpelled, flattened-globose fruits, the broad cordate leaves shining, biglandular above the base of the blade. Inflorescence monoecious, in terminal, oval or oblong, long-peduncled spikes; staminate flowers densely imbricated above, the pistillate at the base or in the inferior axils. Calyx cupuliform, irregularly toothed; staminate column central, bearing below its verticillate projections an indefinite number of sessile extrorse anthers. Style simple, infundibuliform at the apex; stigma many-lobed, with hanging subulate branches. Capsule deeply sulcate into many cocci; seeds rounded, compressed. [Aboriginal name.] Two or three species of tropical America, the following typical.

1. **Hura crepitans** L. Sp. Pl. 1008. 1753.

A high, umbrageous tree, the trunk and branches often prickly. Leaves broadly ovate, roundish, about 5–7 cm. in diameter, cordate at the base,

abruptly acuminate, serrate or subentire, the blades often shorter than the petiole; stipules linear-lanceolate, pubescent; anthers usually 1-3-seriate; stigma large, violet-red; capsule concave at both ends, splitting noisily when ripe and dry, 7-8 cm. broad, 3-4 cm. high.

Forests and wooded hills, at lower and middle elevations, Porto Rico, much planted for shade; St. Croix; St. Thomas; St. Jan.—West Indies; continental tropical America. The brownish-white wood is soft with a specific gravity of about 0.46, used for canoes and for construction. When ripe and dry the fruit splits with a loud report into numerous curved segments. JAVILLO. SANDBOX-TREE. MONKEY-PISTOL.

33. *PEDILANTHUS* Poit. Ann. Mus. Paris 19: 390. 1812.

Shrubs with fleshy branches and milky juice, alternate, entire or undulate leaves with the midrib thickened or flanged beneath (rarely leafless), glandular stipules (if present), opposite floral leaves, and cymose terminal or axillary involucre. Involucres oblique, shoe-shaped, the tube more or less fissured superiorly and notched inferiorly at the bilabiate apex or throat, with 2 lateral and 1 median accessory lobes more or less closing the fissure, the tube bearing an appendix on the superior side of its posterior extremity. Appendix gibbous and interiorly glandular, its lip notched or 2-3-lobed and extending anteriorly above the posterior end of the fissure of the tube. Flowers pedicellate, the staminate numerous, ecalyculate, sometimes with linear bracteoles at the base; pistillate single with the long style finally protruding and generally declinate from the throat of the tube; stigmas 3, connate, often separate at the apex and frequently 2-lobed. Seeds ecarunculate. [Greek, slipper-flower.] About 30 species. Type species: *Euphorbia tithymaloides* L. The plants are known as ITAMA REAL, IPECACUANA, FIDDLE-FLOWER, SLIPPER-PLANT.

Pubescent; leaves linear to narrowly oblanceolate, narrow.

Glabrous, or the inflorescence puberulent; leaves broad.

Leaves obovate, rounded.

Leaves ovate or oblong, acute or acuminate.

Midvein of the leaves flanged beneath.

Midvein of the leaves not flanged.

1. *P. angustifolius*.

2. *P. padifolius*.

3. *P. tithymaloides*.

4. *P. latifolius*.

1. *Pedilanthus angustifolius* Poit. Ann. Mus. Paris 19: 393. 1812.

Tithymaloides angustifolium Kuntze, Rev. Gen. Pl. 620. 1891.

P. tithymaloides angustifolius Griseb. Fl. Br. W. I. 52. 1859.

Stems often several or many, more or less branched, finely pubescent, at least above, erect or arching, 5-13 dm. long. Leaves linear to narrowly oblanceolate, short-petioled, 3-10 cm. long, pubescent, obtuse or acute; cymes few-several-flowered, pubescent; bracts ovate, acute; involucre gibbous, about 1 cm. long, the tube truncate; appendix 4-glandular, the lip ligulate; capsule 6-8 mm. long; seeds about 4 mm. long.

Rocky soil, hillsides and thickets in the dry southern and southwestern districts, Porto Rico; Icacos; Culebra; Vieques; St. Thomas; St. Jan.—Cuba; Hispaniola.

2. *Pedilanthus padifolius* (L.) Poit. Ann. Mus. Paris 19: 391. 1812.

Euphorbia tithymaloides padifolia L. Sp. Pl. 453. 1753.

Glabrous, or the inflorescence puberulent; stems stout, branched, 6-13 dm. high. Leaves obovate or elliptic-obovate, short-petioled, 6-12 cm. long, the apex obtuse, rounded or retuse, the base subcuneate; cymes several-many-flowered, 4-6 cm. broad; involucre 10-12 mm. long; lateral lobes of the tube spatulate; capsule 8-10 mm. long.

Thickets in dry stony ground, St. Croix; St. Thomas (ex Krebs);—St. Kitts; Antigua; Guadeloupe; Hispaniola (according to Millspaugh).

3. *Pedilanthus tithymaloides* (L.) Poit. Ann. Mus. Paris 19: 390. 1812.*Euphorbia tithymaloides* L. Sp. Pl. 453. 1753.*Tithymaloides myrtifolium* Kuntze, Rev. Gen. Pl. 620. 1891.

Branched, 1.2–1.8 m. high. Leaves glabrous, sessile, cuneate at the base, ovate or oblong, 3.5–7.5 cm. long, apex acute or acuminate, margin subundulate, the mid-vein prominently undulate-flanged beneath, the petioles short; cymes terminal, dense; involucre red to purple, 1.1–1.3 cm. long; tube thin, smooth; appendix 4-glandular; capsule 7.5 mm. long, 9 mm. broad, truncate at base and apex; seeds ovate, 5 mm. long.

Roadsides, waste and cultivated grounds, Porto Rico, persistent or spontaneous after cultivation; much planted for ornament, and as a hedge; Vieques; St. Thomas;—Florida; West Indies; Panama; northern South America. Apparently native in the Lesser Antilles. BEJUCO DE ESTRELLA.

4. *Pedilanthus latifolius* Millspaugh & Britton; Britton, Ann. Mo. Bot. Gard. 2: 43. 1915.

Often much branched, glabrous, or the young parts puberulent, 1–2 m. high, the twigs zigzag, slender. Leaves ovate to orbicular-ovate, 5–9 cm. long, short-petioled, the apex acute, the base rounded or subcordate, the midvein not flanged beneath; cymes few-several-flowered; bracts lanceolate, acute; involucre salmon-red, about 10 mm. long; glands 4, in 2 pairs; capsule not seen.

Waste grounds and roadsides, Porto Rico, spontaneous after planting for hedges; Mona;—Bermuda; Jamaica; Cuba; Hispaniola.

34. **EUPHORBIA** L. Sp. Pl. 450. 1753.

Cactus-like shrubs with thick fleshy, generally angular stems, and mostly with few reduced true leaves or none. Leaves and stipules generally represented by spines but often by small or minute caducous bracts. Cymes lateral or terminal, sessile, often few-flowered or even single-flowered; involucre subtended by dilated bractlets; glands of the involucre entire, exappendiculate. Capsules thick, often ligneous; seeds ecarunculate. [Commemorates Euphorbus, King Juba's physician.] About 30 species, of the Old World. Type species: *Euphorbia antiquorum* L.

1. *Euphorbia lactea* Haw. Syn. Pl. Succ. 127. 1812.

A tall, dark green, many-branched, spinous, milky-juiced shrub, 2–5 m. high, the branches 3-angled, the faces 3–8 cm. broad, plano-convex, the angles repand-dentate, compressed on the margin; spines short, thick, divergent, 4–6 mm. long.

Occasionally persistent after planting in Porto Rico for ornament or for hedges;—Florida; West Indies; Mexico. Widely planted. Native of the Old World tropics; often mistaken for *Euphorbia antiquorum* L. MOTTLED SPURGE.

Euphorbia nereifolia L., East Indian, occasionally planted for ornament in Porto Rico and the Virgin Islands, is a shrub or small tree, with fleshy, obovate-oblong leaves 7–12 cm. long, narrowed into short petioles, the flowers few, axillary, sessile or nearly so.

Euphorbia linearifolia L., recorded by Krebs as grown on St. Thomas prior to 1851, is recorded as an unarmed race of *E. spinosa* L., native of southern Europe.

35. **POINSETTIA** R. Graham, Edin. N. Phil. Jour. 20: 412. 1836.

Herbs, rarely shrubs, the inflorescence clustered at the tips of the branches, often subtended by highly colored leaves, the leaves alternate below, opposite above, the blades similar throughout or very various in form. Involucral lobes fimbriate; glands scarious, concave, saucer-, cup- or goblet-shaped, solitary or rarely 3 or 4, marginal, exappendiculate. Capsule exerted, its coccol rounded; seed narrowed upward, generally tuberculate, ecarunculate or with a mere indication of a caruncular body. [In honor of Joel Roberts Poinsette of South Carolina.] About 12 species, mostly American. Type species: *Euphorbia pulcherrima* Willd.

Leaves various, often narrow, the upper ones and the bracts red-blotched at the base; stem slender.

Leaves broad, fiddle-shaped or some of them unlobed, the upper ones blotched with white, pink or scarlet at the base, or unblotched; stem stout.

Leaves fiddle-shaped or dentate.

Leaves entire or very nearly so.

1. *P. heterophylla*.

2. *P. cyathophora*.

3. *P. geniculata*.

1. **Poinsettia heterophylla** (L.) Kl. & Garcke, Monats. Akad. Berlin 1859: 253. 1859.

Euphorbia heterophylla L. Sp. Pl. 453. 1753.

Euphorbia graminifolia Michx. Fl. Bor. Am. 2: 210. 1803.

Euphorbia heterophylla graminifolia Engelm. Bot. Mex. Bound. 190. 1859.

Euphorbia heterophylla linifolia Vahl; Kuntze, Rev. Gen. Pl. 605. 1891.

Euphorbia calyciflora Sessé & Moc. Fl. Mex. ed. 2, 123. 1894.

Annual or perennial, pubescent or nearly glabrous, mostly erect, 3–10 dm. tall, sometimes woody below; branches ascending or the lower often spreading, leafy at the ends. Leaves various even on the same stem, from linear through all shapes to orbicular, entire, dentate, sinuate or even panduriform, the upper ones and the bracts red-blotched at the base; involucre-lobes ovate or oblong, laciniate; capsule about 6 mm. in diameter; seeds ovoid-oblong, pointed, grayish, 2 mm. long, minutely and irregularly tuberculate in more or less transverse lines.

Hillsides at low elevations, southern districts of Porto Rico; St. Croix; St. Thomas; Tortola.—southern United States; Bermuda; West Indies; Mexico and South America. The species consists of many slightly differing races; the two following plants, described as species, may, perhaps, be better regarded as such.

2. **Poinsettia cyathophora** (Murr.) Kl. & Garcke, Monats. Akad. Berlin 1859: 253. 1859.

Euphorbia cyathophora Murr. Comm. Goett. 7: 81. 1786.

Euphorbia heterophylla cyathophora Griseb. Fl. Br. W. I. 54. 1859.

Annual or perennial, more or less pubescent, or glabrate; stem stout, at least sometimes hollow, 3–8 dm. high, erect, the branches ascending, leafy towards the ends or throughout. Leaves, or some of them, characteristically fiddle-shaped with four acute lobes, thin, sometimes all unlobed, or merely dentate, often lobed and unlobed ones on the same plant, the uppermost and the bracts with a white, pink or scarlet blotch at the base; capsule-valves, at least sometimes, with elevated margins.

Waste and cultivated grounds, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida; Bermuda; West Indies (except Bahamas); continental tropical America. Occasionally planted for ornament in Porto Rico and Virgin Island gardens. Recorded from Mona and from Vieques as *P. heterophylla*. MARAVILLA.

3. **Poinsettia geniculata** (Ortega) Kl. & Garcke, Monats. Akad. Berlin 1859: 253. 1859.

Euphorbia geniculata Ortega, Hort. Matr. Dec. 18. 1797.

Euphorbia prunifolia Jacq. Hort. Schoenb. 3: 15. pl. 277. 1798.

E. heterophylla prunifolia Griseb. Fl. Br. W. 1. 54. 1859.

Annual; herbaceous; glabrate; stem stout, simple or branched below, with ascending branches. Leaves thin, ovate to elliptic, or the uppermost ovate-lanceolate, entire or slightly repand-denticulate, acute or acuminate, the uppermost and the bracts whitish-blotched at the base, or green throughout.

Cultivated ground near Cataño, Porto Rico, 1922; St. Thomas (ex Krebs):—Florida; Jamaica; Cuba (according to Klotzsch and Garcke); Montserrat; Guadeloupe; Martinique.

Poinsettia pulcherrima (Willd.) Graham. FLOR DE PASCUA, POINSETTIA, Mexican, luxuriant in Porto Rican and Virgin Island gardens, is a shrub 2–4 m. high, with thin, slender-petioled, lobed or entire leaves 10–20 cm. long, the small yellowish green, cymose flowers subtended by large, lanceolate vermilion-red bracts 5–10 cm. long. [*Euphorbia pulcherrima* Willd.]

36. **DICHYLIUM** [Bolssler] Britton.

Herbs, with jointed stems and branches, constricted at the nodes, the leaves opposite or verticillate, entire, petioled, the stipules gland-like or obsolete, the inflorescence of loose terminal cymes. Involucre turbinate, or narrowly campanulate, the glands transverse, plicate, 2-lipped, the lower lip appendaged. Styles short, 2-lobed. Bractlets fimbriate. Capsule dry, 3-lobed. Seeds longitudinally mammillate. [Greek, referring to the 2-lipped involucre-glands.] A few species of tropical America, the following here designated as typical.

1. **Dichyium Oerstedianum** (Kl. & Garcke) Britton.

Poinsettia Oerstediana Kl. & Garcke, Monats. Akad. Berlin 1859: 253. 1859.

Euphorbia Oerstediana Boiss. in DC. Prodr. 15²: 59. 1862.

Stems erect or ascending, glabrous, branched, 6 dm. high or less. Stipules obsolete; leaves membranous, ovate to oblong or lanceolate, pinnately few-veined, 2–8 cm. long, glabrous, or the under surface sparingly pubescent, the apex acute or acuminate, the base mostly obtuse, the slender petioles 2.5 cm. long or less, those of the uppermost leaves usually short; cymes terminal, bracteolate, few-several-flowered; involucre slender-pedicelled, narrowly campanulate, about 2.5 mm. long, the lobes subtruncate, fringed; capsule puberulent, 3–4 mm. long, its cocci rounded.

Grassy banks, St. Croix; St. Thomas:—Jamaica; Martinique to Trinidad and British Guiana.

37. **AKLEMA** Raf. Fl. Tellur. 4: 114. 1838.

Shrubby or rarely herbaceous plants, the branches jointed. Leaves equilateral, entire, penninerved, cuneate at the base, ternate or verticillate (sometimes opposite), long-petioled; stipules glanduliform. Cymes axillary and terminal, corymbose or paniculate (rarely reduced to a single involucre), the terminal involucre generally hermaphrodite, often many-flowered; glands of the involucre appendiculate; bracteoles between the male flowers numerous, plumose. Capsule depressed, deeply trisulcate; seeds irregularly scrobiculate, ecarunculate. [Greek, not explained.] A few species of tropical America. Type species. *Euphorbia nudiflora* Jacq.

1. *Aklema petiolare* (Sims) Millsp. Ann. Mo. Bot. Gard. 2: 43. 1915.*Euphorbia petiolaris* Sims, Bot. Mag. pl. 883. 1805.*Euphorbia verticillata* Poir. in Lam. Encycl. Suppl. 2: 611. 1811.*Alectrooctonum petiolare* Kl. & Gke. Monats. Akad. Berlin 1859: 248. 1859.

Shrubby or tree-like and up to 7 m. high, the branches glabrous, swollen at the nodes. Leaves ternate, ovate or orbicular, 1–1.5 cm. long, truncate, rounded or narrowed at the base, obtuse or slightly emarginate, entire, the petiole slender, twice or more the length of the blade; inflorescence subtrifloral, shorter than the leaves; involucre long-pedicelled, hemispheric, smooth; lobes ovate, short-fimbriate; glands transverse, ovate, stipitate; styles divaricate, bifid, not thickened at the apex; capsule smooth; cocci obtusely carinate; seeds ovoid-globose, 3 × 2.4 mm., pointed, white, foveolate with numerous large shallow irregular pits [*E. cotinifolia* of West, of Krebs, and of Schlechtendal.]

Hillsides and coastal thickets, eastern and southern districts of Porto Rico, mostly at lower elevations; Culebra; Vieques; St. Croix (?); St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Bahamas; Hispaniola; St. Martin; Martinique; Guadeloupe. MANCHINEEL BERRY.

Aklema cotinoides (Miquel) Millsp. [*Euphorbia cotinoides* Miquel], native of northern South America, with larger, ovate, cordate leaves, the campanulate involucre pubescent, is planted for ornament in Porto Rico gardens.

38. **CHAMAESYCE** S. F. Gray, Nat. Arr. Brit. Pl. 2: 260. 1821.

Annual or perennial herbs or shrubs, the stems often diffuse at the base, the branches prostrate or ascending, forking. Leaves opposite, inequilateral, more or less oblique at the base, entire or toothed; stipules minute, entire or lacerate. Inflorescence solitary or cymose, axillary or terminal; involucre toothed, glandular on the margin; glands 4, appendaged (the fifth gland represented by a sulcus in the margin of the involucral tube.) Capsule more or less globose, 3-coccos, the cocci sharply angled or rounded; seeds minute, ovoid or elongated-ovoid, more or less quadrangular, the facets smooth or transversely ridged. [Greek, ground fig.] About 225 species, known as SPURGE, widely distributed. Type species: *Chamaesyce maritima* S. F. Gray.

A. Herbs or low shrubs.

1. Annual or perennial herbs, not fleshy, or slightly fleshy.

a. Annuals, mostly weeds. (See *C. hyssopifolia*.)

*Glabrous throughout, or merely puberulent above.

Plants erect or ascending; involucre cymose.

Seeds red; cymes axillary.

Seeds black or greenish; cymes terminal.

Leaves oblong to lanceolate.

Leaves broadly oblong.

Plants prostrate; involucre mostly solitary.

Leaves entire.

Leaves denticulate.

**Pubescent, at least the capsules.

Plants erect or ascending; involucre cymose.

Leaves acute or acutish, sharply serrate.

Leaves obtuse, crenulate or denticulate.

Leaves oblong; capsule tomentose.

Leaves ovate; capsule pubescent.

Plants prostrate.

Capsule hirsute on the angles.

Capsule puberulent.

b. Perennials.

Plant glabrous.

Plant pubescent.

Leaves crenate.

Leaves entire.

Plant long-pilose; seeds smooth.

Plant puberulent or short-tomentose; seeds

costate.

1. *C. hypericifolia*.2. *C. hyssopifolia*.3. *C. nutans*.4. *C. serpens*.5. *C. Blodgettii*.6. *C. hirta*.7. *C. lasiocarpa*.8. *C. Berteriana*.9. *C. prostrata*.10. *C. thymifolia*.11. *C. Cowellii*.12. *C. monensis*.13. *C. anegadensis*.14. *C. portoricensis*.

2. Fleshy perennial herbs or low shrubs.
 Leaves crowded, 8–15 mm. long. 15. *C. burifolia*.
 Leaves distant, up to 3 cm. long. 16. *C. VahlII*.
 B. Tall, usually erect shrub with linear or oblong leaves. 17. *C. articulata*.

1. **Chamaesyce hypericifolia** (L.) Millsp. Field Mus. Bot. 2: 302. 1909.

Euphorbia hypericifolia L. Sp. Pl. 454. 1753.

Annual, erect or ascending, 2–8 dm. high, glabrous or the young parts puberulent. Leaves oblong or oblong-lanceolate, 1.5–3 cm. long, obliquely truncate at the base, blunt, more or less serrate, short-petioled, glabrous, sometimes purplish; stipules ovate, acute, thin, dentate and ciliate on the margin; inflorescence cymose in the axils; involucre turbinate, thin, glabrous without, hirtellous at the throat within; lobes lanceolate-triangular, lacerate into 3–5 teeth; glands small, roundish, stalked, the fifth gland represented by a deep sinus flanked by a larger, more triangular lobe; appendages white, orbicular or ovate; capsule glabrous, the cocci carinate; seeds ovoid-quadrangular, red, about 0.8 mm. long, the angles prominent, the facets marked with many transverse broken ridges.

Fields, banks and cultivated grounds, Porto Rico, mostly at lower elevations; Mona; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—Florida; Bermuda; West Indies; continental tropical America north to Mexico.

2. **Chamaesyce hyssopifolia** (L.) Small, Fl. SE. U. S. 712. 1903.

Euphorbia hyssopifolia L. Syst. ed. 10, 1048. 1759.

Euphorbia brasiliensis Lam. Encycl. 2: 423. 1788.

Chamaesyce brasiliensis Small, Fl. SE. U. S. 712. 1903.

Annual, or perennial, sometimes becoming woody, 1–4 dm. high, erect or ascending, with filiform branchlets, and oblong to lanceolate, entire or serrulate, often falcate leaves 1–3 cm. long. Stipules broadly deltoid, bifurcate into lacerate lobes; cymes terminal, few-several-flowered; involucre glabrous without and within, very short-pedicelled, their lobes triangular, mostly entire; glands minute, long-stalked, the fifth represented by a very shallow sinus flanked by two larger involucre lobes; capsule glabrous, strongly 3-coccos; seeds ovoid-quadrangular, black, or greenish, about 1 mm. long, the strong, but rounded, angles white-edged, dorsal face marked by 3 complete transverse ridges.

Banks, roadsides, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Icacos; Vieques; St. Thomas.—Florida; Bermuda; West Indies south to Martinique; continental tropical America.

3. **Chamaesyce nutans** (Lag.) Small, Fl. S. E. U. S. 712. 1903.

Euphorbia nutans Lag. Gen. & Sp. 17. 1816.

Euphorbia Preslii Guss. Fl. Sic. Prodr. 1: 539. 1827.

Chamaesyce Preslii Arthur, Torreya 11: 260. 1912.

Annual, glabrous or nearly so, usually erect, branched, 6 dm. high or less. Leaves oblong, or the upper linear-oblong, varying to oblong-lanceolate, more or less oblique, serrate or serrulate, obtuse or acutish, short-petioled; stipules triangular, lacerate; cymes terminal, bracted by the small upper leaves; involucre slender-stalked, glabrous, the 4 glands with orbicular or reniform appendages; capsule glabrous, about 1 mm. broad; seeds oblong-ovoid, 4-angled, with transverse ridges, nearly black.

Cultivated grounds, Porto Rico; St. Croix.—Bermuda; Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; Grenada; widely distributed in continental America; naturalized in southern Europe.

4. **Chamaesyce serpens** (H. B. K.) Small, Fl. SE. U. S. 709. 1903.

Euphorbia serpens H. B. K. Nov. Gen. 2: 52. 1817.

Euphorbia pileoides Millsp. Field Mus. Bot. 2: 62. 1900.

Annual, prostrate, glabrous; stems very slender, branched, 0.5–30 cm. long. Stipules triangular, denticulate; leaves suborbicular, entire, rounded or retuse,

3-6 mm. long; involucre mostly solitary in the upper axils, the triangular, cleft lobes elliptate, the transversely oblong glands with 2-3-lobed appendages; capsule glabrous, about 1 mm. long, the cocci sharply keeled; seeds ovoid, 4-angled

Banks, roadsides and borders of lagoons at low elevations, southern and southwestern districts of Porto Rico; Mona; St. Croix; Icacos; St. Thomas; Anegada (?);—Hispaniola; Antigua; Martinique; Grenada; Barbados; widely distributed in continental America.

5. **Chamaesyce Blodgettii** (Engelm.) Small, Fl. S. E. U. S. 712. 1903.

Euphorbia Blodgettii Engelm.; Hitchc. Rep. Mo. Bot. Gard. 4: 126. 1893.

Annual, glabrous, prostrate or ascending, the branches 1-4 dm. long. Leaves oblong or nearly so, 3-8 mm. long, minutely serrate toward the apex, oblique at the base, obtuse, petiolate; stipules broadly triangular, acute, ciliate-margined; involucre solitary in the upper axils, campanulate, less than 1 mm. long, short-pedunculate, glabrous without, ciliate at the throat within, the lobes triangular; glands 4, slightly stalked, orbicular to ovate, the fifth represented by a sinus with a rounded fundus and flanked by two larger, nearly quadrilateral lobes; appendages nearly as broad as the glands, entire or 2-3-crenate; capsule glabrous; seeds ovoid-quadrangular, pinkish or brownish, 1 mm. long, the angles prominent, the facets slightly transversely ridged.

Rocky soil, Tortola; Anegada;—Florida; Bermuda; Jamaica; Cuba; Cayman Islands.

6. **Chamaesyce hirta** (L.) Millsp. Field Mus. Bot. 2: 303. 1909.

Euphorbia hirta L. Sp. Pl. 454. (ante). 1753.

Euphorbia pilulifer L. loc. cit. (post). 1753.

Euphorbia oblitterata Jacq. Enum. 22. 1760.

Euphorbia capitata Lam. Encycl. 2: 422. 1786.

Euphorbia pilulifera procumbens Boiss. in DC. Prodr. 15: 21. 1862.

Annual, ascending or nearly prostrate, pubescent with amber-colored, multicellular hairs; stems 1-4 dm. long, forking or simple. Leaves ovate to oblong-lanceolate, more or less falcate, 1-3 cm. long, sometimes blotched with deep-red, oblique at the base, acute, sharply serrate above the middle, petiolate; stipules aristate, hairy; involucre capitulate in peduncled clusters, turbinate; lobes large, triangular, densely long-ciliate; glands 4, stipitate, the fifth replaced by a shallow, rounded sulcus in the involucre margin; capsule 3-coccous, with short crisped hairs; seeds salmon-pink, elongated-ovoid-quadrangular, about 0.8 mm. long, the angles sharp, facets strongly marked with numerous, mostly incomplete, transverse ridges.

Fields, roadsides, banks, waste and cultivated grounds, mostly at lower elevations, Porto Rico; Muertos; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Florida; Bermuda; West Indies; continental tropical America north to Mexico. Races differ in habit, and in size of leaves.

7. **Chamaesyce lasiocarpa** (Kl.) Arthur, Torreya 11: 260. 1911.

Euphorbia lasiocarpa Kl. Nov. Act. Nat. Cur. 19: Suppl. 1, 414. 1843.

Euphorbia scordifolia Spreng. Syst. 3: 791. 1826. Not Jacq.

Annual, erect or nearly so, branched, pubescent, 2-9 dm. high. Leaves oblong, obtuse, 1-4 cm. long, denticulate, inequilateral, short-petioled, the uppermost sometimes very small; stipules triangular, about 1 mm. long; involucre pubescent, narrowly campanulate, 1-1.5 mm. long, in small terminal bracted cymes, their lobes triangular, the white gland-appendages suborbicular, entire or somewhat lobed; capsule nearly 2 mm. long, tomentose; seeds ovoid, 4-angled, wrinkled.

Banks and roadsides, southern districts of Porto Rico, at low elevations;—Jamaica; Hispaniola; Grenada; Tobago; continental tropical America north to Mexico.

8. *Chamaesyce Berteriana* (Balbis) Millsp. Field Mus. Bot. 2: 303. 1909.*Euphorbia Berteriana* Balbis; Spreng. Syst. 3: 794. 1826.*Euphorbia stipitata* Millsp. Field Mus. Bot. 2: 65. 1900.

A low, ascending, densely pubescent annual. Leaves oblong-ovate, obtuse, 1–1.5 mm. long, inequilateral and oblique at the base, crenately denticulate; stipules cylindro-aristate with a broadened base, glabrous; inflorescence cymose involucre minute, oblong-turbinate, long-hairy at the throat without and within; lobes triangular, ciliate; glands 4, minute, orbicular, stipitate, with or without narrow white appendages; capsule crisped-hairy; seed white or pinkish, ovoid-quadrangular, angles sharp and prominent, facets with a few prominent broad, mostly incomplete, transverse ridges.

Fields, banks and hillsides, sandy and rocky soil at low elevations in the dry southwestern districts of Porto Rico; Muertos.—Bahamas; Cuba; Hispaniola; Antigua; Guadeloupe.

9. *Chamaesyce prostrata* (Aiton) Small, Fl. SE. U. S. 713. 1903.*Euphorbia prostrata* Aiton, Hort. Kew 2: 139. 1789.

Annual, prostrate, more or less pubescent, or glabrate; branches slender, 5–15 cm. long, forking. Leaves thin, oblong or ovate, strongly oblique at the base, 4–7 mm. long, obtuse, more or less serrulate toward the apex, minutely pubescent on both sides, petiolate; stipules thin, broadly deltoid, ciliate at the apex; involucre glabrous, axillary, minute; lobes elongate-triangular, ciliate; glands 4, transversely oval, the fifth replaced by a small glabrous tooth on the involucre margin; appendages about the width of the glands, finely many-crenate; capsule glabrous except on the keels of the cocci which bear a fringe of long hairs; seeds pink, ovoid-quadrangular, 1 mm. long, strongly and sharply sculptured by numerous, transverse ridges. [*E. maculata* of Bello, not of Linnaeus; ? *E. Chamaesyce* of West.]

Banks, roadsides, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Culebra; Culbrita; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda;—southeastern United States; Bermuda; West Indies; continental tropical America; tropical Africa.

10. *Chamaesyce thymifolia* (L.) Millsp. Field Mus. Bot. 2: 412. 1916.*Euphorbia thymifolia* L. Sp. Pl. 454. 1753.*E. maculata thymifolia* Griseb. Fl. Br. W. I. 53. 1859.

Annual, prostrate, pubescent or glabrate, the slender stems 5–20 cm. long, more or less branched. Leaves oblong, short-petioled, obtuse, crenulate, 10 mm. long or less, inequilateral; stipules 1 mm. long, lacerate; involucre mostly solitary in the axils, puberulent or glabrous, the triangular lobes ciliate, the glands small, the appendages narrow or wanting; capsules puberulent, about 1 mm. long; seeds oblong, 4-angled, reddish, transversely ridged.

Streets of Mayaguez, collected in 1884 by Sintenis; recorded by Eggers from St. Croix, St. Thomas and St. Jan, but not found by other collectors in the Virgin Islands;—Martinique to Trinidad; Curaçao; Aruba; continental tropical America and Old World tropics.

11. *Chamaesyce Cowellii* Millsp.; Britton, Bull. Torr. Club 43: 457. 1916.

Apparently perennial by a woody root; stems several or many, glabrous, nearly filiform, prostrate, branched, 12 cm. long or less, the nodes swollen. Leaves thick, ovate, entire, obtuse, glabrous, 2–3.5 mm. long, inequilateral, oblique at the rounded or subcordate base, the petioles very short; stipules minute, lacerate; involucre solitary in the upper axils, turbinate, short-stalked, glabrous without, densely woolly within, the triangular lobes aristate, ciliate, the glands green, the narrow appendages crenate; capsule glabrous; seeds about 1 mm. long, the facets transversely ridged.

Crevices of limestone rocks, Cayo Muertos. Endemic.

12. *Chamaesyce monensis* Millsp. Field Mus. Bot. 2: 389. 1914.

Perennial by a thick woody root; stems several or many, slender, puberulent, 4-7 cm. long, the nodes swollen. Stipules triangular, ciliate, about 1 mm. long; leaves thick, purplish-green, ovate to oblong-ovate, 2.5-4 mm. long, crenate, rounded, subcordate, oblique, the petioles 1 mm. long or shorter; involucre solitary at the tips of the branches, campanulate, pilose, the lanceolate lobes ciliate, the glands oval, paired, the appendages minute or none; capsule pilose; seeds ovoid, angled, transversely ridged.

Limestone plateau, Mona. Endemic.

13. *Chamaesyce anegadensis* Millsp. Field Mus. Bot. 2: 394. 1914.

Perennial by a woody root, perhaps sometimes flowering the first year; stems several, slender, prostrate or nearly so, densely white-villous, 5-15 cm. long, more or less branched. Stipules deltoid, ciliate, very small; leaves elliptic to suborbicular, 3-6 mm. long, entire, obtuse, pilose on both sides, the base obliquely cordate, the margin revolute, the petioles about 1 mm. long; involucre solitary, pilose without and within, turbinate, the lobes deltoid, ciliate, the glands oval, the appendages white or pinkish; capsule ovoid, pilose; seed nearly 1 mm. long, sharply angled, smooth.

Rocky plain, Anegada. Endemic.

14. *Chamaesyce portoricensis* (Urban) Millsp. Field Mus. Bot. 2: 394. 1914.

Euphorbia portoricensis Urban, Symb. Ant. 1: 338. 1899.

E. portoricensis albescens Urban, loc. cit. 339. 1899.

Chamaesyce albescens Millsp. Field Mus. Bot. 2: 410. 1916.

Perennial, many-stemmed from the top of a woody root; stems slender, puberulent, short-pubescent or tomentulose, slender, 5-12 cm. long, branched, the nodes swollen. Leaves ovate to orbicular, entire, 2-6 mm. long, obtuse, puberulent to tomentulose, the base obliquely cordate or subcordate, the petioles 1 mm. long or less; stipules small, lacerate; involucre 1 or few near the ends of the branches, campanulate, 1 mm. long, the lobes minute, the glands concave; capsule about 1 mm. long, appressed-pubescent; seeds quadrangular-ovate, few-costate.

Rocky and sandy soil at low elevations in the dry southwestern districts of Porto Rico near the coast; Mona. Endemic.

15. *Chamaesyce buxifolia* (Lam.) Small, Fl. SE. U. S. 711. 1903.

Euphorbia buxifolia Lam. Encycl. 2: 421. 1788.

Euphorbia glabrata Sw. Prodr. 76. 1788.

Euphorbia littoralis H. B. K. Nov. Gen. 2: 54. 1817.

Low, generally erect, glabrous, shrubby, fleshy, 2-5 dm. high; branches usually many. Leaves glabrous, thick, wrinkling in drying, ovate or broadly oblong, 8-12 mm. long, obliquely subcordate at the base, acutish, margin entire, involute; petioles about 1 mm.; involucre campanulate, about 1.5 mm. long, as long as the peduncles or shorter; glands transversely oblong; appendages a mere whitish bordering line; capsule 2 mm. broad, glabrous; seeds white, ovoid-quadrangular, somewhat apiculate, about 1 mm. long, the angles very blunt; facets very shallowly broad-pitted by indistinct and irregularly anastomosing transverse ridges.

Coastal rocks and sands, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada.—Florida; Bermuda; West Indies; continental tropical America.

16. **Chamaesyce VahlII** (Willd.) P. Wilson, Bull. N. Y. Bot. Gard. 8: 395. 1917.

Anisophyllum VahlII Kl. & Garcke, Monats. Akad. Berlin 1859: 36. 1859.
Euphorbia VahlII Willd.; Kl. & Gareke, loc. cit. 37. 1859.

A straggling glabrous, much branched shrub 1.5 m. high or less, the twigs and leaves somewhat fleshy. Leaves flat, oblong to elliptic or oblong-lanceolate, entire, 1-2.5 cm. long, green above, pale beneath, the apex rounded or obtuse and apiculate, the base rounded or subcordate, the petioles about 1 mm. long; stipules small, lacinate; involucre mostly solitary at the ends of the twigs, about 4 mm. long, the glands orbicular; capsule about 3 mm. broad. [*Euphorbia articulata rotundifolia* of Krebs.]

Coastal rocks and cliffs, Quebradillas, Porto Rico; Vieques; St. Thomas; Little St. James Island, St. Jan; Virgin Gorda. Endemic.

17. **Chamaesyce articulata** (Aubl.) Britton, Mem. N. Y. Bot. Gard. 6: 574. 1916.

Euphorbia articulata Aubl. Pl. Guian. 1: 480. 1775.

Euphorbia linearis Retz. Obs. 3: 32. 1783.

Euphorbia linearis heterophylla Kuntze, Rev. Gen. Pl. 605. 1891.

Shrubby, glabrous, 1-6 m. high, the branches divaricate. Leaves glabrous or slightly canescent, linear or narrowly oblong, 2-6 cm. long, rounded or narrowed at the oblique base, acute or blunt, mucronulate, entire, glaucous beneath; petioles short; stipules interpetiolar, broadly deltoid, ciliate; involucre single, terminal-axillary; peduncles more or less winged; involucre lobes wanting, the margin of the tube thickened; glands 4, cup-shaped, with a nipple-like projection at the inner edge; bracteoles very numerous, ligulate below, brush-like above; stigma 3-furcate above the middle; capsule glabrous; seed pink-ashen, ovoid-quadrangular, 1.5 mm. long, the facets transversely anastomose-rugose.

Rocky and sandy situations along and near the coasts, Porto Rico; Desecheo; Muertos; Icaos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada.—St. Martin to St. Vincent.

Codiaeum variegatum (L.) Blume, PERIQUETO; GARDEN CROTON, native of the Sunda Islands, is widely grown for ornament in Virgin Island and Porto Rico gardens and much used as a decorative house-plant, in many races; they are shrubs up to about 2 m. high, with variously colored and mottled, linear to ovate, entire or lobed leaves, the small, greenish flowers in long racemes. [*Croton variegatus* L.]

Triadica sebifera (L.) Small, ARBOL DEL CERA, CHINESE TALLOW-TREE, Asiatic, occasionally planted in Porto Rico and the Virgin Islands, is a small tree, with broadly ovate, entire, short-acuminate, long-petioled leaves, small monoecious flowers without petals in narrow panicles, the fruit a fleshy 3-lobed capsule; its seeds yield a vegetable wax used for candles. [*Croton sebiferum* L.; *Stillingia sebifera* Baill.]

Sterigmanthe splendens (Bojer) Kl. & Garcke, CROWN OF THORNS, Madagascan, a shrub with slender, vine-like branches, copiously armed with spines 1-2.5 cm. long, the obovate or spatulate, entire petioled thin leaves 5-8 cm. long, the involucre in terminal cymes, subtended by 2 ovate, bright red bracts, is grown in Porto Rico and Virgin Island gardens for ornament and interest. [*Euphorbia splendens* Bojer.]

Hevea brasiliensis (H. B. K.) Muell. Arg., PARA RUBBER, the most valuable of all plants yielding india rubber, experimentally planted at the Agricultural Experiment Station, Mayaguez, had, in 1924, formed trees about 15 m. high. It

has long-petioled, 3-foliolate leaves with entire elliptic-lanceolate leaflets 10-15 cm. long, the small monoecious flowers panicle, the fruit a large capsule with usually 3 seeds 2-3 cm. long. [*Siphonia brasiliensis* H. B. K.]

Jatropha podagrica Hook., TARTOGO, GOUTY-STALKED JATROPHA, of Central America, occasionally planted for interest in Porto Rico, has a swollen fleshy trunk up to 5 dm. high, the petioled ovate-orbicular, peltate, 3-5-lobed leaves 10-20 cm. long, the small flowers in dense long-stalked cymes.

Jatropha cuneifolia Sessé & Moç. Fl. Mex. ed. 2, 224. 1894. Recorded by Sessé & Moçino as found in dry fields near Coamo, is known from their description only; we have failed to find any plant answering the description in the Coamo region. Urban suggested that it might be *J. spathulata* (Ortega) Muell. Arg. of Mexico.

Breynhia nivosa (W. G. Smith) Small, NEVADA, SNOW-BUSH, ICE-PLANT, of the South Sea Islands, planted for ornament in Porto Rico and the Virgin Islands, is a shrub up to about 2 m. in height, with oval, green white and pink variegated leaves 2-6 cm. long, and small greenish axillary pedicelled flowers. [*Phyllanthus nivosus* W. G. Smith.]

Adenorima punicea (Sw.) Raf., [*Euphorbia punicea* Sw.], a very milky, red-bracted tree endemic in Jamaica, was recorded by Krebs from St. Thomas, presumably in error.

Claeoxylon Mercurialis (L.) Thwaites [*Tragia Mercurialis*, L.], an annual weed of the Old World tropics, otherwise unknown in America, was recorded by Krebs as formerly found in St. Thomas.

Macaranga Tanarius (L.) Muell. Arg., an East Indian tree with broad peltate leaves, was recorded by Krebs as growing in St. Thomas, prior to 1851; it may have been planted there [*Ricinus Tanarius* L.; *Mappa tanaria* Spreng.].

Bischofia trifoliata (Roxb.) Hook., KAINFAL, East Indian, represented by a fine tree, over 20 m. high, at the Mayaguez Agricultural Experiment Station, has long-petioled, 3-foliolate leaves with ovate serrulate acuminate leaflets 8-15 cm. long, the numerous minute greenish flowers in axillary panicles. [*Andrachne trifoliata* Hook.]

Synaderium Granti Hook., AFRICAN MILK-BUSH, of tropical Africa, a shrub 2-3 m. high, with stout stems and branches, obovate leaves 7-10 cm. long, the cymes of red involucre tomentose, is occasional in Porto Rico gardens.

Order 15. SAPINDALES.

Mostly trees or shrubs. Petals usually present and separate. Sepals mostly distinct. Stamens rarely more than twice as many as the sepals, when as many or fewer, often opposite them. Ovary superior, compound. Ovules pendulous, with the raphe away from the axis of the ovary, or erect or ascending.

- | | |
|---|------------------------|
| A. Petals wanting; flowers monoecious; leaves opposite, simple. | Fam. 1. BUXACEAE. |
| B. Petals present (except in <i>Dodonaeaceae</i>). | |
| 1. Ovary mostly 1-celled (3-5-celled in <i>Spondias</i>). | Fam. 2. ANACARDIACEAE. |
| Tissues resiniferous; ovule 1. | Fam. 3. ICACINACEAE. |
| Tissues not resiniferous; ovules 2. | |

2. Ovary 2-several-celled.

*Filaments not opposite the petals.

a. Leaves simple, pinnately veined.

Ovules 1 in each ovary-cavity.

Fruit a small drupe. Fam. 4. ILLICACEAE.

Fruit a small capsule. Fam. 5. CYRILLACEAE.

Ovules 2 or more in each ovary-cavity.

Flowers with a disk and petals.

Seeds with endosperm. Fam. 6. CELASTRACEAE.

Seeds without endosperm. Fam. 7. HIPPOCRATEACEAE.

Disk obsolete; petals wanting. Fam. 8. DODONAEACEAE.

b. Leaves compound, sometimes 1-foliolate.

Leaves opposite; seeds with endosperm. Fam. 9. STAPHYLEACEAE.

Leaves nearly always alternate; seeds with-

out endosperm. Fam. 10. SAPINDACEAE.

**Filaments opposite the petals. Fam. 11. SABIACEAE.

Family 1. **BUXACEAE** Dumort.

Box FAMILY.

Monoecious or dioecious trees, shrubs or perennial herbs, with simple mostly evergreen leaves, the sap not milky. Flowers regular, bracted. Petals none. Staminate flowers with 4-7 distinct stamens, the anthers 2-celled; sometimes with a rudimentary pistil. Pistillate flowers with a 2-4-celled (mostly 3-celled) ovary, with 2 or 1 anatropous ovules in each cavity; styles as many as the ovary-cavities, simple. Fruit a capsule or drupe, its carpels 1-2-seeded. Embryo straight; endosperm fleshy, or almost wanting. About 6 genera and 40 species of both the Old World and the New.

1. **TRICERA** Sw.; Schreb. Gen. 630. 1791.

Evergreen shrubs or small trees, with opposite entire coriaceous short-petioled leaves, and small monoecious flowers in small, axillary or terminal, sessile or short-stalked clusters, the bracts small, herbaceous or coriaceous. Terminal flowers of the clusters usually pistillate, the lower staminate. Pistillate flowers usually with 6 imbricated sepals, the ovary 3-celled, the 3 styles separate, or connate below; ovules 2 in each ovary-cavity, pendulous. Staminate flowers with 4 sepals, 4 stamens with oblong anthers, and a rudimentary ovary. Capsule 2-3-horned. [Greek. three-horned.] About 23 species, natives of the West Indies. Type species: *Crantzia laevigata* Sw.

Leaves 5-11 cm. long, the apex acuminate.

Leaves 2-5 cm. long, acute or obtuse, mucronate.

1. *T. citrifolia*.2. *T. Vahlii*.1. **Tricera citrifolia** Willd. Sp. Pl. 4: 338. 1805.*Buxus citrifolia* Spreng. Syst. 3: 847. 1826.*Buxus citrifolia fuscescens* Muell. Arg. in DC. Prodr. 16¹: 15. 1869.

A shrub, with slender glabrous branches. Leaves ovate-lanceolate or elliptic-lanceolate, 5-11 cm. long, subcoriaceous, glabrous, pinnately veined, the apex acuminate, the base narrowed or obtuse, the petioles about 5 mm. long; inflorescence short, several-flowered; staminate flowers on pedicels about 1 cm. long, the oblong sepals about 4 mm. long; pistillate flowers with distinct styles.

Eastern Porto Rico, collected only by Wydler, or perhaps also by Bredemeyer:—Venezuela. A rare plant, known to us from Porto Rico only as recorded by Mueller and by Urban.

2. *Tricera Vahl* (Baill.) Britton, Bull. Torr. Club 42: 502. 1915.*Burus Vahl* Baill. Mon. Bux. 67. 1859.*Tricera laevigata sancti-crucis* Eggers, Vidensk. Medd. 1876: 143. 1876.

A glabrous shrub, 1-3 m. high, with slender twigs. Leaves oblong or oblong-ovate, 2-5 cm. long, subcoriaceous, faintly pinnately veined, the apex acute or obtuse, sharply mucronate, the base narrowed, the petioles 3 mm. long or less; inflorescence much shorter than the leaves, few-flowered; pedicels very short; sepals about 2 mm. long, ovate-oblong, acute; capsule about 6 mm. long, with 3 horns. [*Crantzia laevigata* of Vahl, not of Swartz.]

Coastal thickets near Rincon and limestone hills near Ponce, Porto Rico; Stony Ground. St. Croix. Endemic.

Family 2. **ANACARDIACEAE** Lindl.

SUMAC FAMILY.

Trees or shrubs, with acrid resinous or milky sap, alternate or rarely opposite leaves, and polygamo-dioecious or perfect, mainly regular flowers. Calyx 3-7-cleft. Petals of the same number, imbricated in the bud, or rarely none. Disk generally annular. Stamens as many or twice as many as the petals, rarely fewer, or more, inserted at the base of the disk; filaments mostly separate; anthers commonly versatile. Ovary in the staminate flowers 1-celled. Ovary in the pistillate flowers 1- or sometimes 4-5-celled; styles 1-3; ovules 1 in each cavity. Fruit generally a small drupe. Seed-coat bony or crustaceous; endosperm little or none; cotyledons fleshy. About 60 genera and 500 species, most abundant in warm or tropical regions, a few extending into the temperate zones.

Leaves simple.

Fruit a large drupe; stamens 1-5.

Fruit leathery, borne on an enlarged stalk; stamens 8-10.

Leaves compound.

Ovary 1-celled.

Flowers 3-merous.

Flowers 5-merous.

Ovary 3-5-celled.

1. *Mangifera*.2. *Anacardium*.3. *Comocladia*.4. *Metopium*.5. *Spondias*.1. **MANGIFERA** L. Sp. Pl. 200. 1753.

Trees, mostly large, with alternate petioled entire coriaceous leaves, and small polygamous flowers in terminal panicles. Calyx 4-5-parted, deciduous, the lobes imbricated. Petals 4 or 5, narrow, imbricated. Stamens 1-5, unequal, all polleniferous or some sterile, the filaments sometimes connate below. Ovary sessile, superior, 1-celled, 1-ovuled; style lateral, curved; stigma simple. Drupe ovoid, oblique, large, fleshy, the stone fibrous. Seed flattened, its testa thin, the cotyledons plano-convex, usually lobed, the radicle ascending. [Latin, mango-bearing.] About 14 species of tropical Asia, the following typical.

1. *Mangifera indica* L. Sp. Pl. 200. 1753.

A large tree, sometimes 20 m. high or more, with a trunk up to 2.5 m. in diameter, the branches spreading, the stout twigs glabrous. Leaves coriaceous, lanceolate or oblong-lanceolate, 15-25 cm. long, acute, acuminate or sometimes blunt at the apex, narrowed at the base, glabrous, dark green above, the petioles about 2.5 cm. long; panicles large, terminal, pubescent, the flowers very numerous, green, about 4 mm. wide; fruit pendulous, usually 8-12 cm. long, smooth, greenish or yellowish, the flesh soft and juicy.

Hillsides, fields, roadsides and river valleys, spontaneous after planting; widely planted for its fruit and for its wood, and for shade, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola.—Florida; West Indies; continental tropical America and Old World tropics. Native of tropical Asia. MANGO. MANGO.

2. *ANACARDIUM* L. Sp. Pl. 383. 1753.

Trees or shrubs, with alternate entire petioled simple leaves, and small polygamous flowers in large terminal panicles. Calyx 5-parted, deciduous, the lobes imbricated. Petals 5, linear. Torus stipe-like. Stamens 8–10, all polleniferous or some barren; filaments distinct or connate at the base. Ovary sessile, obovate or obcordate; style excentric, filiform, the stigma very small. Fruit leathery, nut-like, indehiscent, borne on an enlarged pyriform stalk. [Greek, referring to the fruit.] A few species, natives of tropical America, the following typical.

1. *Anacardium occidentale* L. Sp. Pl. 383. 1753.

A tree, up to about 13 m. high, with spreading branches, the twigs and leaves glabrous. Leaves obovate to elliptic, subcoriaceous, 6–13 cm. long, the apex rounded or emarginate, the base narrowed or obtuse, the strong lateral veins widely spreading, the petiole 1.5 cm. long or less; panicle peduncled, many-flowered, longer than the leaves, puberulent; bracts ovate or ovate-lanceolate, puberulent; calyx-segments about 4 mm. long; petals about 8 mm. long, purple; fruit reniform, 2–2.5 cm. long, borne on a thick stalk.

Hillsides and plains at lower elevations in moist and dry districts, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Jamaica; Cuba; Hispaniola; St. Martin to Trinidad; continental tropical America. Often planted for its fruit. MARANON. CAJUIL. CASHEW-NUT.

The nuts are edible after roasting and shelling, but the shell contains a poisonous substance, eliminated by heat; this roasting process must be carefully operated as the poisonous fumes may otherwise blister the skin and inflame the eyes. The roasted nuts are an important product and pass into commerce; they are delicious, somewhat resembling almond seeds in taste. The trunk of the tree yields a commercial gum, used for mucilage and as a varnish, and the bark may be used for tanning; the astringent sap yields a kind of ink; the shell of the nut yields cardol oil used in medicine. The wood is hard and strong, its specific gravity about 0.49.

3. *COMOCLADIA* P. Br.; L. Syst. ed. 10, 861. 1759.

Tall or low trees, the trunks usually simple or sometimes few-branched, erect, crowned with tufts of large alternate unevenly pinnate leaves, the small polygamous flowers glomerulate in axillary panicles, often purple. Calyx 3-parted, the segments imbricated. Petals 3. Stamens 3, distinct, borne at the sinuses of the small disk. Ovary sessile, 1-celled; stigmas 3, sessile or nearly so. Fruit a fleshy drupe. Seed with a membranous testa and fleshy cotyledons. [Greek, referring to the tufted leaves.] About 23 species, of tropical America, mostly West Indian, those of Porto Rico known as CARASCO. Type species: *Comocladia pinnatifolia* L. The sap of some species is poisonous.

Leaflets broadly ovate, 1–3 cm. long; twigs, petioles and leaf-rachis pilose.

Leaflets oblong to oblong-lanceolate, 6–10 cm. long; twigs and leaves nearly glabrous.

1. *C. Dodonaea*.

2. *C. glabra*.

1. *Comocladia Dodonaea* (L.) Urban, Symb. Ant. 4: 360. 1910.

Ilex Dodonaea L. Sp. Pl. 125. 1753.

Comocladia ilicifolia Sw. Prodr. 17. 1788.

A small virgate slender tree, 2–5 m. high, the twigs, petioles and leaf-rachis rather densely pilose. Leaves 1–3 dm. long; leaflets 11–21, close together, sessile,

broadly ovate, 3 cm. long or less and about as wide as long, more or less pubescent, spinulose-dentate or sometimes entire, spinulose-tipped, prominently veined; panicles mostly shorter than the leaves, pilose; flowers purple, glomerulate; calyx about 0.5 mm. long; petals about 1 mm. long; fruit ovoid-oblong, about 1 cm. long.

Banks, hillsides and thickets at lower elevations, Porto Rico, mostly near the coasts, but ascending to 300 meters, and most abundant in dry districts; Mona; Muertos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Hispaniola; Anguilla to St. Vincent. MAIS PELADO. MAIS TOSTADO. POISON ASH. PRAPRA. COCK'S-SPUR.

2. *Comocladia glabra* (Schultes) Spreng. Syst. 1: 176. 1825.

Comocladia ilicifolia glabra Schultes, Mant. 1: 350. 1822.

Comocladia acuminata Moç. & Sessé; DC. Prodr. 2: 65. 1825.

Comocladia glabra acuminata Urban, Symb. Ant. 4: 361. 1911.

A tree, up to about 8 m. high, erect or sometimes straggling, the twigs and leaves glabrous or sparingly pubescent. Leaves 3–4.5 dm. long; leaflets 11–31, very nearly sessile, close together or somewhat separated, oblong-ovate or oblong-lanceolate, 4–10 cm. long or the lower ones shorter, spinulose-dentate, the apex acute or acuminate and spinulose-tipped, the base obtuse to subcordate, the prominent lateral veins widely spreading; panicles sometimes as long as the leaves, usually shorter, glabrous; calyx about 0.5 mm. long; petals obtuse, 1 mm. long; fruit oblong, about 1 cm. long.

Wooded hills, thickets and forests at lower and middle elevations in moist or wet districts, Porto Rico.—Cuba?; Hispaniola.

4. **METOPIMUM** P. Br.; Engler in DC. Mon. Phan. 4: 367. 1883.

Poisonous trees, with alternate petioled unevenly pinnate leaves, the several leaflets entire, subcoriaceous, the small greenish dioecious flowers in axillary panicles. Sepals 5, imbricated. Petals 5, imbricated, longer than the sepals. Disk annular. Stamens 5, the filaments short, subulate, the anthers longitudinally dehiscent. Ovary 1-celled; style short; stigma 3-lobed; ovule one. Drupe oblong, glabrous, pointed, containing a parchment-like stone. [Greek, forehead, significance not explained.] Three species, natives of the West Indian region. Type species: *Rhus Metopium* L.

1. *Metopium toxiferum* (L.) Krug & Urban; Urban, Bot. Jahrb. 21: 612. 1898.

Myrsis toxifera L. Syst. ed. 10, 1000. 1759.

A tree, up to 14 m. high with a trunk sometimes 2 dm. in diameter, the thin bark reddish-brown without, orange within, splitting into large scales, the branches widely spreading. Leaves 3 dm. long or less, glabrous; leaflets 3–7, ovate to suborbicular or obovate, chartaceous, 2.5–10 cm. long, acute, obtuse or emarginate at the apex, narrowed to cordate at the base, bright green and shining above, dull beneath, the petioles 1–3 cm. long; panicles many-flowered, as long as the leaves or longer; pedicels rather stout, 2–4 mm. long; sepals obtuse or much shorter than the ovate obtuse yellowish-green petals; drupes oblong, orange-yellow, 1–1.5 cm. long, in spreading or drooping panicles.

Coastal woods and thickets, western and southwestern districts of Porto Rico; Mona.—Florida; Bahamas; Cuba; Hispaniola. CEDRO PRIETO. PAPAYO. POISON-TREE.

5. **SPONDIAS** L. Sp. Pl. 371. 1753.

Trees, with alternate, unevenly pinnate leaves, and small polygamous flowers in terminal or lateral panicles. Calyx 4–5-cleft, deciduous. Petals 4 or 5.

Disk cup-like, crenate. Stamens 8-10. Ovary sessile, 3-5-celled; styles 4 or 5, short. Fruit a drupe with a bony pit and a thin fleshy exocarp. [Greek name for a plum-tree.] About 10 species of tropical distribution. Type species: *Spondias Mombin* L.

Inflorescence lateral; leaflets obovate, 2-4 cm. long, very nearly sessile. 1. *S. purpurea*.
 Inflorescence terminal; leaflets ovate or ovate-lanceolate, 5-12 cm. long, distinctly petioled. 2. *S. Mombin*.

1. ***Spondias purpurea*** L. Sp. Pl. ed. 2, 613. 1762.

A tree, up to about 10 m. high, usually lower, the often gnarled branches spreading, the gray bark tuberculate-roughened when old, the stout twigs glabrous. Leaves about 2 dm. long or less, petioled, glabrous; leaflets 9-25, thin, obovate, 1.5-4 cm. long, sessile or nearly so, the lateral ones obliquely inequilateral, the apex acute or obtuse, the base cuncate; panicles puberulent, mostly lateral and shorter than the leaves; flowers pink or red; pedicels 2-4 mm. long; calyx-lobes obtuse; petals oblong, acuminate, about 3 mm. long; drupe ovoid, purple, about 2.5 cm. long.

Hillsides and roadsides, Porto Rico, often planted for its fruit and for shade; St. Croix; St. Thomas; St. Jan.—Jamaica; Cuba; Hispaniola; Cayman Islands; St. Martin to Trinidad; continental tropical America. JOBILLO. JOBO FRANCES. CIRUELA DEL PAIS. SPANISH PLUM. JAMAICA PLUM.

2. ***Spondias Mombin*** L. Sp. Pl. 371. 1753.

Spondias lutea L. Sp. Pl. ed. 2, 613. 1762.

Spondias pseudomyrobalanus Tussac, Fl. Ant. 4: 97. 1827.

A tree, up to 20 m. high, the twigs glabrous or sparingly puberulent, the bark armed with stout prickles. Leaves 2-3 dm. long, petioled; leaflets 9-19, thin, ovate to ovate-lanceolate or oblong-lanceolate, rather distant, glabrous or the petiolules puberulent, 5-10 cm. long, acute or acuminate, the lateral ones inequilateral, the petiolules 4-6 mm. long; panicles terminal, often as long as the leaves, many-flowered; flowers greenish white; pedicels 2-4 mm. long; calyx-lobes triangular; petals oblong, about 3 mm. long; drupe ovoid, yellow, 3-4 cm. long.

Woodlands, hillsides, roadsides and river valleys at lower and middle elevations, Porto Rico, often planted for its fruit and for shade; St. Croix; St. Thomas; St. Jan; Tortola.—West Indies (except Bahamas); continental tropical America and Old World tropics. The thin pulp of the fruit is pleasantly acid. The wood is strong, light brown, durable, with a specific gravity of about 0.5. JOBO. HOG PLUM.

Spondias cirouella Tussac (*S. cironella* Bello), planted in Porto Rico and the Virgin Islands, differs from *S. purpurea* in having yellow fruit. CIRUELA.

Spondias dulcis Frost. JOBO DE LA INDIA, GOLDEN APPLE, planted occasionally for its fruit on Porto Rico and St. Croix, is a native of the islands of the Pacific Ocean; its leaflets are nearly equilateral, its large yellow fruit 8-10 cm. long. [*S. citharea* Tussac; *S. mangifera* of Bello, not of Willdenow.]

Schinus terebinthifolius Raddi, CHRISTMAS-BERRY TREE, South American, a shrub with slender elongated branches, pinnate leaves of about 7 sessile oblong leaflets 3-6 cm. long, the small white flowers in terminal panicles, the globose drupes red, about 1 cm. in diameter, was seen at the Insular Experiment Station, Rio Piedras, Porto Rico, in 1924, the plant about 1.5 m. high.

Pistacia chinensis Bunge, Chinese, was seen at the St. Croix Agricultural Experiment Station in 1923, as seedling plants, and at the Insular Experiment Station, Rio Piedras, Porto Rico, in 1924.

Family 3. **ICACINACEAE** Miers.

ICACINA FAMILY.

Trees or shrubs, with alternate, mostly entire leaves, the small regular, perfect or polygamous, 4-parted or 5-parted flowers mostly petaliferous, the petals distinct or united. Stamens as many as the petals and alternate with them. Ovary 1-celled. Ovules usually 2, pendulous. Style simple. Fruit mostly drupaceous, 1-celled, 1-seeded, the seed pendulous with a very small embryo. About 40 genera, including some 110 species of tropical distribution.

Corolla polypetalous; stamens hypogynous.
Corolla gamopetalous; filaments adnate to the corolla-tube.

1. *Mappia*.
2. *Ottoschulzia*.

1. **MAPPIA** Jacq. Hort. Schoenb. 1: 22. 1787.

Trees or shrubs with alternate leaves and small cymose-paniculate polygamous flowers. Calyx 5-toothed. Petals 5, valvate. Stamens 5, hypogynous; filaments slender; anthers oblong. Disk cupulate. Style short; stigma thickened. Drupe with a hard pit. [Commemorates Marc Mappus, a German physician and botanist.] About 8 species, natives of tropical regions, the following typical.

1. **Mappia racemosa** Jacq. Hort. Schoenb. 1: 22. 1797.

A tree, up to about 10 m. high, usually lower, often shrubby, the young twigs and leaves appressed-pubescent, becoming glabrous. Leaves oblanceolate or oblong-lanceolate, rather thin, entire, 6–15 cm. long, obscurely pinnately veined, glabrous or nearly so when mature, the apex acute or obtuse, the base cuneate, the slender petioles 1–2.5 cm. long; panicles usually many-flowered, shorter than the leaves; pedicels very short; flowers about 6 mm. broad, greenish yellow; drupe ovoid, rounded, about 1.5 cm. long.

Collected by Gundlach near Quebradillas (according to Urban);—Jamaica; Cuba.

2. **OTTOSCHULZIA** Urban, Symb. Ant. 7: 272. 1912.

Trees with coriaceous or chartaceous, alternate entire leaves, and small axillary or lateral flowers, solitary or glomerate. Sepals 5, united only at the base. Corolla gamopetalous, its ovate lobes valvate. Stamens 5, borne at the top of the corolla-tube; filaments flattened; anthers triangular-ovate. Disk very small. Style short; stigma minute. Drupe ovoid. [Dedicated to Otto E. Schulz, German botanist.] Three known species of the West Indies. Type species: *Poraqueiba cubensis* C. Wright.

1. **Ottoschulzia rhodoxylon** Urban, Symb. Ant. 7: 274. 1912.

Poraqueiba rhodoxylon Urban, Symb. Ant. 5: 405. 1908.

Twigs glabrous, the buds minutely pilose. Leaves orbicular-ovate or oval, 6.5–8 cm. long, 4.5–6 cm. wide, thick-coriaceous, flat, the apex rounded or obtuse, the base rounded or subtruncate, the petioles 6–8 mm. long.

Collected by Krug near Mayaguez. Endemic. PALO DE ROSA. A little known species neither flowers nor fruit collected. A tree with this Spanish name is reported from the vicinity of Isabella.

Family 4. **ILICACEAE** Lowe.

HOLLY FAMILY.

Shrubs or trees, with watery sap, and alternate petioled simple leaves. Flowers axillary, small, white, mainly polygamo-dioecious, regular. Stipules minute and deciduous, or none. Calyx 3-7-parted, generally persistent. Petals 4-7 (rarely more), separate or slightly united at the base, hypogynous, deciduous, imbricated. Stamens hypogynous, as many as the petals, or sometimes more; anthers oblong, cordate. Disk none. Ovary 1, superior, 3-several-celled; stigma discoid or capitate; style short or none; ovules 1 or 2 in each cavity. Fruit a small berry-like drupe, enclosing several nutlets. Seed pendulous; endosperm fleshy; embryo straight. Three genera and about 300 species, of temperate and tropical regions.

1. **ILEX** L. Sp. Pl. 125. 1753.

Leaves minutely stipulate. Flowers cymose or solitary, perfect or polygamous. Calyx small, 4-5-cleft or toothed. Petals 4-7, somewhat united at the base, oblong, obtuse. Stamens of the same number, adnate to the base of the corolla. Berry-like drupe globose, with 4-8 bony or crustaceous nutlets, [Ancient name of the Holly Oak.] About 280 species, mostly natives of America, those of Porto Rico evergreen, known as CUERO DE SAPO, their wood hard and heavy. Type species: *Ilex Aquifolium* L.

- | | |
|--|-------------------------------|
| Leaves ovate or ovate-lanceolate, serrate, acute or acuminate; flowers 5-7-parted. | 1. <i>I. Macfadyenii</i> . |
| Leaves obovate to oblong, rounded or obtuse. | |
| Flowers fasciated in the axils. | |
| Leaves or some of them crenate, 5-10 cm. long; flowers 4-5-parted. | 2. <i>I. nitida</i> . |
| Leaves entire or obscurely crenulate. | |
| Flowers 5-7-parted. | |
| Flowers 4-parted, rarely 5-parted. | 3. <i>I. sideroxyloides</i> . |
| Leaves obovate, 5-12 cm. long. | |
| Leaves oval or oval-obovate, 3-8 cm. long. | 4. <i>I. quianensis</i> . |
| Leaves obtuse at base. | |
| Leaves narrowed or acute at base. | 5. <i>I. Urbaniana</i> . |
| Flowers solitary or few in the axils; leaves 1-3 cm. long. | 6. <i>I. Riedlaci</i> . |
| | 7. <i>I. Sintenisii</i> . |

1. **Ilex Macfadyenii** (Walp.) Rehder, Journ. Arn. Arb. 3: 215. 1923.

- Prinos montanus* Sw. Prodr. 58. 1788.
Prinos Macfadyenii Walp. Rep. 1: 541. 1842.
Ilex montana Griseb, Mem. Am. Acad. 8: 171. 1860. Not T. & G. 1840.

A tree, up to about 10 m. high, usually lower, sometimes a shrub, the twigs and leaves glabrous. Leaves ovate to ovate-lanceolate, subcoriaceous, 3-7 cm. long, serrate or serrulate, the apex acute or acuminate, the base narrowed or rounded, the petioles 2-7 mm. long; inflorescence 1-several-flowered, glabrous or nearly so; flowers 5-7-parted; calyx about 2 mm. broad; petals ovate to elliptic, about 2 mm. long; fruit globose, 5-7 mm. in diameter

Wooded valley of the Rio de Maricao:—Jamaica; Cuba; Hispaniola; St. Kitts to Martinique.

2. **Ilex nitida** (Vahl) Maxim. Mem. Acad. St. Petersb. VII. 29³: 27. 1881.

- Prinos nitidus* Vahl, Eclog. 2: 26. 1798.
Ilex nitida Alexandri Loesener, Bot. Jahrb. 15: 135. 1892.

A tree, up to 20 m. high, glabrous throughout. Leaves obovate or oblong-obovate, coriaceous, crenate or nearly quite entire, 5-10 cm. long, the apex

rounded or obtuse, the base obtuse or narrowed, the petioles 7–12 mm. long; flowers fascicled in the axils, 4–5-parted; pedicels 4–15 mm. long; calyx about 2 mm. broad; petals ovate or oval, 3–4 mm. long; drupe globular, red to black, 6–7.5 mm. in diameter. [*Ilex dioica* of Grisebach, of Bello and of Stahl, not *Prinos dioica* Vahl; *Ilex macoucoua* of Stahl, not of Persoon.]

Wooded hills and forests in wet or moist districts, middle and higher elevations, Porto Rico:—Jamaica; Montserrat; Guadeloupe, Martinique; Mexico. HUESO PRIETO. BRIGUETA. Murphy records the wood as used for fuel and for huts.

3. *Ilex sideroxyloides* (Sw.) Griseb. Kar. 76. 1857.

Prinos sideroxyloides Sw. Prodr. 58. 1788.

I. sideroxyloides occidentalis forma *portoricensis* Loesener, Bot. Jahrb. 15: 316. 1892.

A tree, up to 15 m. high, glabrous throughout. Leaves mostly obovate or oblong-obovate, coriaceous, entire, 3.5–10 cm., the apex rounded or obtuse, the base narrowed or cuneate, the petioles 5–12 mm. long; flowers fascicled or rarely solitary in the axils; 5–7-parted; pedicels 3–12 mm. long; calyx 3–4 mm. in diameter; petals 3–4 mm. long, connate below the middle; drupe globose or ovoid-globose, 6–8 mm. in diameter.

Forests, Sierra de Luquillo:—Montserrat to St. Vincent. GONGOLIN.

4. *Ilex guianensis* (Aubl.) Kuntze, Rev. Gen. Pl. 113. 1891.

Macoucoua guianensis Aubl. Pl. Guian 1: 88. 1775.

Ilex macoucoua Pers. Syn. 1: 152. 1805.

A small tree, up to 8 m. high, usually lower, sometimes a shrub, the twigs gray, glabrous or minutely puberulent. Leaves typically oblong-obovate, subcoriaceous, glabrous, entire, 6–10 cm. long, the apex rounded or obtuse, the base narrowed or cuneate, the petioles 5–10 mm. long; flowers 4-parted, rarely 5-parted, fascicled in the axils; pedicels of the staminate flowers up to 10 mm. long; calyx about 2 mm. broad; petals 1.5–2 mm. long; drupe globose or ellipsoid, 5–6 mm. in diameter.

Woods near Aguada and near Rincon:—Hispaniola, Trinidad; Mexico to French Guiana. MACOUCOUA.

5. *Ilex Urbaniana* Loes. Bot. Jahrb. 15: 316. 1892.

A shrub, about 3 m. high, or a small tree, the slender twigs puberulent or glabrate. Leaves oval or oval-obovate, coriaceous, entire, glabrous, 4–8 cm. long, the apex rounded or emarginate, the base obtuse or subcuneate, the petioles 5–9 mm. long; flowers fascicled in the axils, the peduncles 1–3-flowered, puberulent, about as long as the petioles; flowers 4-parted; calyx about 2 mm. broad; petals 2–3 mm. long; drupe subglobose, about 6 mm. in diameter.

Forest, Mamey near Utuado, Porto Rico; Tortola. Endemic.

6. *Ilex Riedlaei* Loes. Bot. Jahrb. 15: 317. 1892.

A glabrous shrub or small tree, with slender twigs. Leaves coriaceous, obovate, shining above, 3–5 cm. long, obsoletely undulate or entire, the apex rounded or emarginate, the base acute, the petioles 5–7 mm. long; flowers 4-parted, fascicled in the axils; pedicels short, 1–3-flowered; calyx about 1 mm. broad; petals about 2 mm. long; fruit unknown.

Porto Rico, collected by Riedlé; specimens from Monte Alegrillo are referred to this species from Loesener's description:—Hispaniola.

7. *Ilex Sintenisii* (Urban) Britton.

Vaccinium (?) *Sintenisii* Urban, Symb. Ant. 5: 454. 1908.

A little tree, 2.5–5 m. high, glabrous throughout, much branched, the twigs slender, angulate. Leaves obovate or orbicular-obovate, dark green, coriaceous, entire, 1–3 cm. long, the apex rounded, emarginate, the base narrowed, the petioles 2–6 mm. long; inflorescence peduncled, few-flowered, much shorter than the leaves; fruiting pedicels solitary, 4–7 mm. long; calyx about 2 mm. broad, 4–5-parted, the lobes obtuse; drupe globose, about 5 mm. in diameter.

Mountain summits, Sierra de Luquillo and Sierra de Naguabo. Endemic.

Ilex paraguayensis St. Hil., MATE, PARAGUAY TEA, South American, has been experimentally planted at the Forest Station and at the Insular Experiment Station at Rio Piedras; it is a shrub or small tree with obovate dentate leaves, a decoction of which furnishes a well-known South American beverage.

Family 5. **CYRILLACEAE** Lindl.

CYRILLA FAMILY.

Glabrous shrubs, or small trees, with simple entire alternate estipulate leaves, long-persistent or evergreen, and small regular perfect bracted racemose flowers. Sepals 4–8 (mostly 5), persistent. Petals the same number as the sepals, hypogynous, distinct, or slightly united by their bases, deciduous. Stamens 4–10, in 1 or 2 series, distinct, hypogynous; anthers introrse, 2-celled, the sacs longitudinally dehiscent. Ovary 2–5-celled; ovules 1–4 in each cavity, anatropous, pendulous; style short or none; stigma very small, or 2–3-lobed. Fruit dry, small, 1–5-seeded. Seeds oblong or spindle-shaped; endosperm fleshy; embryo central, cylindric. Three genera and 6 known species, natives of America.

1. **CYRILLA** Garden; L. Mant. 1: 50. 1767.

Racemes clustered at the ends of twigs of the preceding season. Sepals 5, firm, acute, shorter than the petals. Petals 5, white, acute, spreading. Stamens 5, opposite the sepals, the filaments subulate, the anthers oval. Ovary ovoid, sessile, mostly 2-celled, sometimes 3-celled; ovules 2–4 in each cavity; style short, thick, 2–3-lobed. Fruit ovoid, 2–3-seeded, the pericarp spongy. [In honor of Domenico Cyrillo, professor of medicine at Naples.] A few species, of southeastern United States and tropical America, the following typical.

1. **Cyrilla racemiflora** L. Mant. 50. 1767.

Ilex Cyrilla Sw. Prodr. 50. 1788.

Cyrilla antillana Michx. Fl. Bor. Am. 1: 158. 1803.

A shrub or small tree, the bark at the base spongy. Leaves oblanceolate, obovate or oval, cuneate-narrowed at the base, 5–10 cm. long, 6–25 mm. wide; racemes narrow, 5–15 cm. long, bearing the very numerous small white flowers nearly to the base; pedicels 2–4 mm. long, somewhat longer than the bracts, or shorter; fruit about 2 mm. long.

Mountain forests and thickets, Porto Rico, in wet or moist districts:—southeastern United States; Jamaica; Cuba; Hispaniola; Guadeloupe to St. Vincent; northern South America. SOUTHERN LEATHERWOOD.

Family 6. **CELASTRACEAE.**

STAFF-TREE FAMILY.

Trees or shrubs, some species climbing. Leaves simple. Stipules, when present, small and caducous. Flowers regular, generally perfect, small. Pedicels commonly jointed. Calyx 4-5-lobed or -parted, persistent, the lobes imbricated. Petals 4 or 5, spreading. Stamens inserted on the disk. Disk flat or lobed. Ovary sessile, mostly 3-5-celled; style short, thick; stigma entire or 3-5-lobed; ovules 2 in each cavity, anatropous. Fruit drupaceous or capsular. Seeds with endosperm, with or without an aril; embryo large; cotyledons foliaceous. About 45 genera, and 375 species, widely distributed.

Fruit a deliscent capsule; seeds arillate.	1. <i>Maytenus</i> .
Fruit indehiscent; seeds not arillate.	
Cells of the ovary 1-ovuled.	
Sepals connate near the base.	2. <i>Rhacoma</i> .
Sepals distinct or nearly so.	
Leaves opposite; ovule pendulous.	3. <i>Gyminda</i> .
Leaves alternate; ovule erect.	4. <i>Schaefferia</i> .
Cells of the ovary 2-ovuled.	5. <i>Elaeodendrum</i> .

1. **MAYTENUS** Molina, Sagg. Chile 177. 1782.

Unarmed, evergreen shrubs or trees, with alternate petioled coriaceous leaves, and small polygamous axillary flowers, solitary or in clusters. Calyx 5-lobed. Stamens 5, the filaments subulate. Disk orbicular, undulate. Ovary immersed in the disk, 2-4-celled; ovules 1 or 2 in each cavity, erect; style slender or none; stigma 2-4-lobed. Fruit a small coriaceous capsule, 1-3-celled, loculicidally 2-3-valved. Seeds erect, the testa crustaceous; the aril fleshy; cotyledons foliaceous. [From the Chilean name.] Type species: *Maytenus Boaria* Molina.

Flowers umbellate-fascicled or solitary.

Fruit oblong or obovoid.

Leaves elliptic to orbicular-obovate, about twice as long as wide.

Leaves oblong-obovate, about 3 times as long as wide.

Fruit globular.

Flowers in small cymes.

1. *M. elliptica*.
2. *M. elongata*.
3. *M. ponceana*.
4. *M. cymosa*.

1. **Maytenus elliptica** (Lam.) Krug. & Urban; Duss. Fl. Ant. Franc. 145. 1897.

Senecia elliptica Lam. Tabl. Encycl. 2: 96. 1793.

Rhamnus laevigatus Vahl, Symb. 3: 41. 1794.

Ceanothus laevigatus DC. Prodr. 2: 30. 1825.

A tree, up to 12 m. high, glabrous throughout, the bark smooth, the slender twigs angular. Leaves elliptic to broadly obovate, coriaceous, 3-10 cm. long, nearly twice as long as wide, the lateral venation rather indistinct, the apex rounded, obtuse or emarginate, the base narrowed or obtuse, the petioles 3-7 mm. long; flowers 5-parted, fascicled in the axils or sometimes solitary on pedicels 2-7 mm. long; sepals broad, nearly 1 mm. long; petals ovate, about 1.5 mm. long; filaments subulate; ovary 2-celled with 2 ovules in each cavity; fruit 8-12 mm. long, oval or obovoid.

Forests, thickets and arroyos, at lower elevations in dry or moist districts, recorded as ascending to higher elevations, Porto Rico; St. Croix; St. Thomas; St. Jan.—St. Eustatius to Grenada; recorded from Hispaniola. CUERO DE SAPO. BOIS FLAMENT.

2. **Maytenus elongata** (Urban) Britton.

Maytenus elliptica elongata Urban, Symb. Ant. 5: 66. 1904.

A tree, up to 12 m. high, the slender twigs and the leaves glabrous. Leaves oblong or oblong-obovate, coriaceous, 4-9 cm. long, entire, about 3 times as long

as wide, narrowed at both ends, the apex acute or obtusish, the petioles 4–5 mm. long; fruiting pedicels fascicled or solitary, 4–7 mm. long; fruit obovoid-ellipsoid, about 9 mm. long.

Forests near Hatillo and along Rio de Maricao. Endemic.

3. *Maytenus ponceana* Britton, sp. nov.

A tree, about 12 m. high, with slender, somewhat tortuous, glabrous twigs. Leaves oblong or oblong-obovate, coriaceous, 9 cm. long or less, indistinctly few-veined with the midrib rather prominent on both sides, shining above, dull beneath, the apex bluntly short-acuminate or obtuse, the base subcuneate, the rather slender petioles 6–8 mm. long; fruiting pedicels 3–5 mm. long, solitary or 2 together in the axils; fruit globose, whitish, 6–8 mm. in diameter.

Hillside, Rio Portugues, north of Ponce, Porto Rico, (*Britton 7818*). In fruit Feb. 12, 1923. Endemic.

4. *Maytenus cymosa* Krug & Urban; Urban, *Symb. Ant.* 1: 43. 1898.

A tree, on Vieques up to 5 m. high, glabrous, the slender twigs angular. Leaves oval to obovate, entire, 3–5 cm. long, subcoriaceous, grayish green, rounded or obtuse at both ends or the base somewhat narrowed, the petioles 2–4 mm. long; flowers in small axillary cymes, subglomerate, the clusters a little longer than the petioles, the pedicels very short; sepals broad, suborbicular, about 1 mm. broad; petals oval, about as broad as the sepals; ovary 2-celled. [*M. elaeodendroides* of Eggers, not of Grisebach.]

Thickets, Vieques; St. Croix; St. Thomas. Endemic.

2. RHACOMA L. *Syst. ed.* 10, 896. 1759.

Shrubs or low trees, with coriaceous small evergreen leaves, and small perfect greenish axillary flowers. Calyx 4–5-lobed. Disk depressed, 4–5-lobed. Petals 4 or 5, inserted under the disk. Stamens 4 or 5. Ovary 4-celled; stigmas 4; ovules 1 in each cavity of the ovary, erect. Drupe with a somewhat fleshy thin exocarp and a bony stone. [Name used by Pliny for some Old World plant.] About 12 species, of warm and tropical America. Type species: *Rhacoma Crossopetalum* L.

1. *Rhacoma Crossopetalum* L. *Syst. ed.* 10, 896. 1759.

Crossopetalum Rhacoma Crantz, *Inst.* 2: 321. 1766.

Myginda Rhacoma Sw. *Prodr.* 39. 1788.

Myginda rotundata Lam. *Tabl. Encycl.* 1: 308. 1791.

Myginda pallens J. E. Smith in *Rees Cycl.* 25: no. 4. 1813.

Crossopetalum pallens Kuntze, *Rev. Gen. Pl.* 116. 1891.

Rhacoma pallens Maza, *Anal. Soc. Esp. Hist. Nat.* 19: 239. 1900.

A shrub or tree, up to 8 m. high, with smooth gray bark and glabrous angular twigs. Leaves opposite or whorled, linear to oblong or obovate, short-petioled, 1–4 cm. long, somewhat crenate, glabrous, acutish or blunt at the apex, narrowed at the base, paler green beneath than above; flowers clustered in the axils, the clusters slender-peduncled; calyx urceolate, with 4 obtuse lobes; petals 4; disk 4-lobed, stamens 4, inserted between the lobes of the disk; ovary 4-celled; drupe about 6 mm. long, slightly oblique, red. [*Myginda latifolia* of Vahl, not of Swartz.]

Thickets, woodlands and hillsides at lower elevations, mostly in dry districts, Porto Rico; Mona; Muertos; Iacos; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin

Gorda; Aneгада:—Florida; Bermuda; West Indies; Colombia. Consists of several races, differing in size and shape of leaves; one of these with narrowly oblong leaves inhabits cliffs of the Arecibo limestone in Porto Rico. CORAL. MANTO. MARAVEDI. POISON CHERRY. WILD CHERRY.

3. **GYMINDA** Sargent, Gard. & For. 4: 4. 1891.

Trees or shrubs, with opposite, short-petioled leaves, and small greenish dioecious flowers in axillary cymose clusters. Calyx deeply 4-cleft. Petals 4, longer than the calyx. Staminate flowers with 4 stamens about as long as the petals, and a minute abortive ovary. Pistillate flowers with a 2-celled ovary, each cavity with a single pendulous ovule; style none; stigma peltate. Fruit a small drupe. Seeds usually solitary, with copious endosperm. [Anagram of *Myginda*.] Two known species, the following typical one, the other Costa Rican.

1. **Gyminda latifolia** (Sw.) Urban, Symb. Ant. 5: 80. 1904.

Myginda latifolia Sw. Prodr. 39. 1788.

Myginda integrifolia H. B. K. Nov. Gen. 7: 66. 1825.

Gyminda Grisebachii Sargent, Gard. & For. 4: 4. 1891.

A shrub, or a tree with maximum height of about 9 m., the thin bark reddish brown, the trunk seldom over 1.5 dm. in diameter, the young twigs 4-angled, glabrous. Leaves oblong or oblong-obovate, subcoriaceous, glabrous, 2-6 cm. long, obtuse or emarginate at the apex, narrowed at the base, the petioles very short; peduncles slender, 6-15 mm. long; petals about 2 mm. long; drupe ellipsoid, obtuse, 4-8 mm. long. [*Elaeodendrum attenuatum* of Stahl, not of Richard.]

Thickets, woodlands and hillsides, mostly at low elevations near the coasts, Porto Rico; Mona; Muertos; Vieques; St. Thomas; Aneгада:—Florida; Jamaica; Bahamas; Cuba to St. Vincent; Mexico. COCORRONCITO. MALA-MUGER. FALSE BOXWOOD.

4. **SCHAEFFERIA** Jacq. Enum. 10, 33. 1760.

Shrubs or trees, with alternate or fascicled, entire, chartaceous or subcoriaceous leaves (in one species reduced to small scales), and small, mostly dioecious, white or greenish flowers, solitary or clustered in the axils, the peduncles short. Calyx 4-parted, the lobes rounded, imbricated. Petals 4, obtuse. Stamens 4. Disk inconspicuous. Ovary sessile, ovoid, 2-celled; ovules 1 in each cavity, erect; style short; stigma 2-parted, large. Fruit coriaceous, indehiscent. Seeds erect, exarillate, with little endosperm and flat cotyledons. [Commemorates J. C. Schaeffer, a German naturalist.] Five known species, of tropical and subtropical America, the following typical.

1. **Schaefferia frutescens** Jacq. Enum. 33. 1760.

A tree, up to 14 m. high, with a maximum trunk diameter of about 3 dm., usually much smaller, commonly a shrub, the bark gray, narrowly fissured, scaly, the slender twigs glabrous. Leaves obovate, spatulate or oblong, chartaceous, glabrous, veiny, 2.5-6 cm. long, acute, obtuse or rarely emarginate at the apex, narrowed at the base, the petioles 3-8 mm. long; flowers greenish, about 3 mm. wide; peduncles slender, mostly somewhat longer than the petioles; fruit globose or oval, orange-red, grooved, apiculate, 5-6 mm. long. [*Erythrozydon havanense* of Stahl and of Cook and Collins.]

Thickets, woodlands, hillsides and arroyos at lower and middle elevations, Porto Rico; Mona; Icaos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; West Indies south to Grenada. JIBA.

5. **ELAEODENDRUM** Jacq. f.; Murray, Syst. 241. 1784.

Evergreen trees or shrubs, with opposite or alternate coriaceous leaves, the very small stipules caducous, and small, often dioecious, greenish or white flowers in small axillary clusters. Calyx 5-parted. Petals 5, spreading. Stamens 5, inserted under the disk; filaments short; anthers globose. Ovary adnate to the disk, 2-5-celled; style short; stigma 2-5-lobed, ovules 2 in each ovary-cavity. Fruit a rather large drupe. [Greek, olive-wood; the fruit resembles an olive in form.] About 35 species, natives of tropical regions. Type species: *Elaeodendron orientale* Jacq.

1. **Elaeodendrum xylocarpum** (Vent.) DC. Prodr. 2: 11. 1825.

Celastrus polygamus Vahl in West, St. Croix 276. Hyponym. 1793.

Cassine xylocarpa Vent. Choix des Plantes 23. 1803.

Rhamnus corymbosa Vahl; R. & S. Syst. 5: 294. 1819.

Elaeodendrum rotundatum DC. Prodr. 2: 11. 1825.

Sageretia corymbosa G. Don, Gen. Syst. 2: 29. 1829.

Cassine rotundata Kuntze, Rev. Gen. Pl. 114. 1891.

A glabrous dioecious tree, with maximum height of about 10 m., usually lower, sometimes shrubby, the bark smooth, the wood hard and fine-grained. Leaves coriaceous, light green, opposite or some of them alternate, various, elliptic to oblong or obovate, 1.5-10 cm. long, 1-7 cm. wide, the apex acute or obtuse, the base narrowed or rounded, the rather stout petioles 8 mm. long or less, the margin entire or sparingly crenulate; inflorescence shorter than the leaves; flowers green; pedicels 3 mm. long or less; sepals about 1 mm. long; petals 2-3 mm. long; fruit globular to ellipsoid, rounded, 1.5-3 cm. long, hard and yellow or greenish yellow. [*Rhamnus polygamus* of West, not of Jacquin; *Elaeodendrum attenuatum* of Cook and Collins, not of Richard.]

Coastal woods and thickets, Porto Rico; Muertos; Icaicos; Vieques; Culebra; Culebrita; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada. Endemic. COSCORRAN. GUAYAVOTO. MARBLE-TREE. SPOON-TREE. NUT MUSCAT.

Family 7. **HIPPOCRATEACEAE** H. B. K.

HIPPOCRATEA FAMILY.

Woody vines, shrubs or trees, with simple stipulate, mostly opposite, petioled leaves, and small, perfect and regular flowers in cymes. Stipules caducous. Calyx 5-parted, the sepals imbricated, persistent. Petals 5; Disk depressed or cup-like. Stamens usually 3, inserted near the base of the disk; filaments flattened. Ovary trigonous, superior, 3-celled; ovules 2-10 in each cavity; style short or long; stigma 3-lobed. Fruit of 3 flat woody carpels or in *Salacia* baccate. Seeds without endosperm, the cotyledons foliaceous. Two genera, the following and *Salacia*, including over 150 species of tropical distribution.

1. **HIPPOCRATEA** L. Sp. Pl. 1191. 1753.

Woody vines, usually tendril-bearing, sometimes high-climbing, the twigs mostly terete. Leaves opposite, pinnately veined, toothed or entire. Cymes usually compound or paniced. Petals green or white, spreading. Disk somewhat fleshy. Filaments distinct, short, the apex recurved; anthers extrorse. Style trigonous, subulate. Fruiting carpels large, spreading or divergent, nearly distinct or somewhat connate at the base, compressed, 2-valved or indhiscent,

few-seeded. Seeds flat, winged, without endosperm, the cotyledons large, the radicle very short. [Commemorates Hippocrates.] Some 80 species or more in tropical regions of both the New World and the Old. Type species: *Hippocratea volubilis* L.

1. **Hippocratea volubilis** L. Sp. Pl. 1191. 1753.

Hippocratea scandens Jacq. Enum. 12. 1760.

Hippocratea obcordata Lam. Tabl. Encycl. 1: 100. 1791.

Hippocratea ovata Lam. Tabl. Encycl. 1: 100. 1791.

Hippocratea ovata oblongifolia DC. Prodr. 1: 568. 1824.

Psidium (?) *Berterianum* Berg. Linnaea 27: 374. 1856.

Guayava Berteriana Kuntze, Rev. Gen. Pl. 240. 1891.

Climbing, up to 7 m. long or longer, the twigs and inflorescence puberulent, the tendrils coiled, sometimes 1 dm. long. Leaves coriaceous or subcoriaceous, various, elliptic to ovate or ovate-lanceolate, glabrous, crenulate, 4–10 cm. long, the apex acute, acuminate or obtuse, the base narrowed or rounded, the petioles 5–10 mm. long; inflorescence axillary, shorter than the leaves, peduncled; pedicels very short; flowers usually numerous, greenish, glomerate; sepals about 0.5 mm. long; petals 1.5–2.5 mm. long; fruiting carpels oblong to oblong-obovate, 3–6 cm. long, rounded or emarginate; seeds samaroid, the wing about as long as the body.

Thickets, woodlands, forests, hillsides and arroyos, Porto Rico, at lower and middle elevations, in moist and dry districts; Vieques; doubtfully recorded by Krebs from St. Thomas;—Florida; Cuba; Hispaniola; Guadeloupe to Trinidad; continental tropical America. BEJUCO PRIETO.

Hippocratea caribaea Urban, Symb. Ant. 6: 55. 1909.

This was described from specimens collected by Eggers on the Cerro de Pandura, and from others collected in Guadeloupe, Dominica and Martinique. We have not seen authentic Porto Rico specimens, but those from Guadeloupe and Martinique do not appear to be specifically distinct from *H. volubilis*. We searched for the plant on the Cerro de Pandura in 1922, but failed to find it. The fruit is unknown.

A shrub or small tree at Guayanilla, Porto Rico, with glabrous twigs and glabrous coriaceous entire opposite, narrowly oblong or oblong-oblong leaves about 7 cm. long and 1.5 cm. wide, the apex sharply acute, the base narrowed, the stout petioles about 5 mm. long, may represent another species of this family.

Family 8. **DODONAEACEAE** H. B. K.

DODONAEA FAMILY.

Shrubs or trees, commonly sticky with a resinous excretion. Leaves alternate, without stipules. Flowers clustered, usually paniced, small, polygamous or polygamo-dioecious. Sepals 3–5, nearly equal. Corolla and disk wanting. Androecium of 5–8 regularly inserted stamens; filaments distinct; anthers 4-angled. Gynoecium of 3 or 4 united carpels, wholly superior. Ovary 3–4-celled; styles united. Ovules 2 in each cavity, half-anatropous, often superposed, the upper one ascending and the lower one pendulous. Capsule membranous or leathery; reticulated, 2–6-angled, the angles obtuse, or winged, opening septicidally by 2–6 valves. Seed subglobose or flattened, without an aril; endosperm none; embryo spiral. Only the following genus.

1. **DODONAEA** Jacq. Enum. 19. 1760.

Characters of the family, as given above. [In honor of Rembert Dodoens, 1518–1585, Dutch herbalist.] About 50 species, of tropical and subtropical regions. Type species: *Dodonaea viscosa* Jacq.

Leaves chartaceous, obovate, 6 cm. long or less, slightly viscid. 1. *D. Ehrenbergii*.
Leaves membranous, broadly oblanceolate, 6–12 cm. long, very viscid. 2. *D. viscosa*.

1. **Dodonaea Ehrenbergii** Schl. Linnæa 18: 36. 1844.

? *Dodonaea clacagnoides* Rudolphi; Ledeb. & Adlerstam, Diss. Pl. Dom. 18. 1805.

Dodonaea viscosa obovata Hitchc. Rep. Mo. Bot. Gard. 4: 73. 1893.

A nearly glabrous shrub or small tree sometimes 5 m. high, the foliage slightly viscid, the twigs slender. Leaves oblanceolate to obovate, chartaceous, 1.5–6 cm. long, obtuse, rounded or emarginate at the apex, cuneate-narrowed at the base, the petioles 1 cm. long or less; panicles terminal, rather densely many-flowered, puberulent, not longer than the leaves; pedicels short; flowers yellowish green, about 5 mm. broad; capsule-wings finely veined, obtuse, 5–8 mm. wide, papery, shining. [Referred by Urban to *D. spathulata* J. E. Smith, of the Sandwich Islands.]

Thickets, Mona; Anegada:—Bahamas; Cuba; Hispaniola; Desirade. DOG-WOOD.

2. **Dodonaea viscosa** Jacq. Enum. 19. 1760.

A viscid shrub, 1–5 m. high, with slender twigs. Leaves oblanceolate or oblong-oblanceolate, membranous, 5–10 cm. long, obtuse or rounded and usually apiculate at the apex, the base cuneate, the petioles short; panicles terminal, several-many-flowered, glabrous or nearly so; flowers slender-pedicelled, greenish, 5–6 mm. broad; capsules mostly larger than those of the preceding species.

Coastal thickets, in sandy or rocky soil, Porto Rico; St. Croix; St. Thomas:—Florida; Jamaica; Cuba; Hispaniola; St. Martin to Trinidad; continental tropical America and Old World tropics. CHAMISO. GITARAN.

Family 9. **STAPHYLEACEAE** DC.

BLADDER-NUT FAMILY.

Trees or shrubs, with mostly opposite odd-pinnate or 3-foliolate leaves, and regular perfect flowers in terminal or axillary clusters. Sepals, petals and stamens usually 5. Carpels mostly 3. Disk large, the stamens inserted at its base without. Anthers introrse, 2-celled. Fruit a dehiscent bladderly capsule or indehiscent. Seeds solitary or few in each carpel; testa hard; endosperm fleshy; embryo straight. About 5 genera, and 22 species, widely distributed.

1. **TURPINIA** Vent. Choix des Plantes 31. 1803.

Trees or shrubs, with opposite, odd-pinnate (rarely simple), leaves, the lateral leaflets opposite, the flowers small, white, perfect and regular, in terminal panicles. Calyx 5-cleft, persistent, the sepals imbricated. Petals 5, suborbicular, sessile, imbricated. Disk lobed or crenate. Stamens 5, the filaments flattened. Ovary 3-lobed, sessile; styles 3, distinct or connate; stigmas capitate; ovules few or several, anatropous. Fruit subglobose, 3-celled, indehiscent. Seeds flattened, the cotyledons plano-convex. [Commemorates P. J. F. Turpin, a French botanist and artist.] About 10 species, natives of tropical regions, the following typical.

1. *Turpinia paniculata* Vent. Choix des Plantes 31. 1803.

Maurocunia occidentalis leucosperma Kuntze, Rev. Gen. Pl. 150. 1891.

A tree, up to 20 m. high, usually lower, the young twigs and leaves puberulent, soon becoming glabrous. Leaflets 5-11, short-stalked, ovate to oblong-lanceolate, 3-8 cm. long, crenate or nearly entire, thin in texture, the apex acute or acuminate, the base rounded or narrowed; panicles glabrous, commonly as long as the leaves or longer, sometimes over 2 dm. broad, many-flowered; flowers 6-8 mm. broad; sepals and petals oval, obtuse; stamens about as long as the petals; fruit depressed-globose, 1-1.5 cm. broad, its lobes rounded.

Forests, in wet or moist districts, Porto Rico, mostly at middle or higher elevations, Tortola;—Cuba; Hispaniola; Central America. AVISPILLO. CEDRO HEMBRA. SAUCO CIMARRON.

Turpinia occidentalis (Sw.) G. Don, is described by Bello and is doubtfully recorded by Urban as from near Mayaguez from a barren specimen collected by Krug; it inhabits Jamaica and the Lesser Antilles. We have found only *T. paniculata* in Porto Rico.

Turpinia glandulosa Bello, Anales Soc. Esp. Hist. Nat. 10: 250. 1881.

This is known from incomplete description only and remains an uncertain species.

Family 10. **SAPIN ACEAE** R. Br.

SOAPBERRY FAMILY.

Trees, vines or shrubs, with watery sap, the leaves mostly alternate, mostly pinnate or decompound, without stipules. Flowers polygamodioecious, regular or slightly irregular. Sepals or calyx-lobes 4 or 5, mostly imbricated. Petals 3-5. Disk fleshy. Stamens 5-10 (rarely fewer or more), generally inserted on the disk. Ovary 1, 2-4-lobed or entire, 2-4-celled; ovules 1 or more in each cavity. Fruit various. Seeds globose or compressed; embryo mainly convolute; endosperm none. About 125 genera, including over 1,000 species, widely distributed in tropical and warm regions.

Vines; mostly climbing by tendrils.

Fruit 3-winged.

Fruit capsular.

Fruit bladdery.

Shrubs and trees.

Fruit samaroid.

Fruit drupaceous or capsular.

Inflorescence spicate-paniculate or racemose-paniculate.

Leaves 1-3-foliolate; flowers irregular.

Leaves pinnate; flowers regular.

Fruit capsular, dehiscent.

Stamens short, not exerted; sepals distinct.

Filaments slender, exerted; calyx 5-lobed.

Fruit drupaceous, indehiscent.

Drupe saponaceous; seed not arillate.

Drupe not saponaceous; seed arillate.

Inflorescence corymbose-paniculate.

Ovary 2-celled; leaves evenly pinnate.

Ovary 3-celled; leaves trifoliolate.

1. *Serjania*.

2. *Paullinia*.

3. *Cardiospermum*.

4. *Thyana*.

5. *Allophylus*.

6. *Cupania*.

7. *Malayba*.

8. *Sapindus*.

9. *Melicocca*.

10. *Erothea*.

11. *Hypelate*.

1. **SERJANIA** Plum.: Schum. Skr. Natur. Selsk. Kjoeb. 3: 125. 1794.

Woody vines, with alternate petioled, mostly biternately compound leaves, and small polygamous white or yellowish flowers, in axillary racemes or panicles, which often bear tendrils. Sepals 5, imbricated. Petals 4, with small scales

between. Disk undulate or sometimes glanduliferous. Stamens 8, the filaments sometimes united at the base. Ovary 3-celled; styles partly united; stigmas 3, small; ovules 1 in each cavity. Fruit of 3 samaras attached by their backs, each bearing a seed near the apex. [Commemorates Paul Sergeant.] About 175 species, of tropical and subtropical America. Type species: *Serjania sinuata* (L.) Schum.

Seed not enclosed by the samara-wing; leaflets strongly reticulate-veined.
Seed enclosed in the upper part of the samara-wing; leaflets not reticulate-veined.

1. *S. polyphylla*.
2. *S. diversifolia*.

1. *Serjania polyphylla* (L.) Radlk. Mon. Serj. 179. 1875.

- Paullinia polyphylla* L. Sp. Pl. 366. 1753.
Paullinia triternata Jacq. Sel. Amer. 110. 1763.
Serjania lucida Schum. Skr. Nat. Selsk. 3: 128. 1794.
Serjania triternata Willd. Sp. Pl. 2: 466. 1799.
Serjania dubia Spreng. Syst. 2: 247. 1825.

Slender, the branches and leaves glabrous or nearly so, often climbing on trees or shrubs, 2–10 m. long. Leaflets ovate to elliptic, 6 cm. long or less, coriaceous, acute or sometimes obtuse, dentate, reticulate-veined, shining above, dull beneath; panicles densely whitish-puberulent, commonly longer than the leaves; pedicels 2–5 mm. long; petals obovate, white, about 5 mm. long; fruit broadly ovate, 1.5–2.5 cm. long, the samara-wing not enclosing the seed. [*Paullinia curassavica* of West, not of Linnaeus; (?) *P. carthaginensis* of Krebs.]

Thickets and woodlands at lower and middle elevations in moist and dry districts, Porto Rico; Muertos; Icaicos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada.—Hispaniola. BEJUCO DE CORRALES. BEJUCO DE COSTILLA. BLACK WITHE. BASKET WOOD. The stems are used in basketry.

2. *Serjania diversifolia* (Jacq.) Radlk. Mon. Serj. 136. 1875.

- Paullinia diversifolia* Jacq. Enum. 36. 1760.

Slender, often high-climbing on trees, sometimes 10 m. long, the young twigs puberulent. Leaflets ovate to obovate, 3–8 cm. long, coriaceous, acute or obtuse, few-toothed near the apex or entire, shining above, dull beneath; panicles puberulent, commonly longer than the subtending leaves; pedicels 5–8 mm. long; petals oblong-obovate, about 5 mm. long; fruit rather broadly ovate, 1.5–2 cm. long, the seed enclosed in the upper part of the samara-wing.

Primeval forest, Cayuco, near Utuado, determined by Radlkofer from a barren specimen collected by Sintenis; not seen by us from Porto Rico or the Virgin Islands:—Bahamas; Cuba; Hispaniola.

2. PAULLINIA L. Sp. Pl. 365. 1753.

Woody vines, with alternate, pinnate or decompound leaves, and small, somewhat irregular flowers in axillary racemes, which usually bear 2 tendrils. Sepals 5, imbricated. Petals 4, with 2 small scales. Disk annular. Stamens 8, the filaments distinct or united below. Ovary 3-celled; styles nearly distinct or partly united. Ovule 1 (rarely 2) in each ovary-cavity. Fruit capsular, 3-angled or 3-winged. Commemorates Simon Paulli, 1608–1680, professor in Copenhagen. About 125 species of tropical America. Type species: *Paullinia pinnata* L.

Petiole and leaf-rachis winged; capsule 3-angled.
Petiole and leaf-rachis wingless, or the rachis narrowly wing-margined;
capsule 3-winged.
Capsule nearly 2 cm. long, its wings persistent.
Capsule about 1 cm. long, its wings separating.

1. *P. pinnata*.
2. *P. Plumieri*.
3. *P. fuscescens*.

1. *Paullinia pinnata* L. Sp. Pl. 366. 1753.

Usually high-climbing, up to 10 m. long or longer, the branches angular, somewhat pubescent when young. Leaves 8–15 cm. long, short-petioled, the petiole winged, pubescent; leaflets usually 5, sessile, ovate to elliptic-ovate, coriaceous, dentate, 6–12 cm. long, nearly glabrous and shining above, usually pubescent on the veins beneath, the apex acute or short-acuminate, the base rounded, the rachis winged between them; racemes long-peduncled, narrow, pubescent; flowers white, about 5 mm. broad; capsule pyriform, 3-angled, 1.5–3 cm. long, stipitate.

Forests, woodlands and thickets at lower and middle elevations, in moist and dry districts, Porto Rico; Vieques; St. Thomas; Tortola;—Cuba; Hispaniola; Martinique to Trinidad; continental tropical America; tropical Africa. BEJUCO DE COSTILLA.

2. *Paullinia Plumieri* Triana & Planchon, Ann. Sci. Nat. IV, 18: 360. 1862.

High-climbing, the young branches densely puberulent. Leaves 5–15 cm. long, biternate; petioles and leaf-rachis slender, wingless, puberulent; leaflets ovate, sessile or short-stalked, 3–7 cm. long, remotely dentate, shining above, dull beneath, glabrous or nearly so on both sides; racemes puberulent, peduncled, densely many-flowered as long as the leaves or longer; capsule suborbicular, 3-winged, puberulent, about 1.5 cm. long.

Hillside, Sage Mountain, Tortola (*Shafer 1158*); the specimens are in flower only and the determination therefore uncertain:—Antigua; Guadeloupe; Martinique.

3. *Paullinia fuscescens* H. B. K. Nov. Gen. 5: 120. 1821.

Climbing, up to 15 m. long, pubescent or nearly glabrous. Leaves 7–15 cm. long, biternate; petioles slender, wingless; rachis wingless or narrowly wing-margined; leaflets lanceolate, oval or ovate, dentate, the terminal ones 2.5–5 cm. long; racemes peduncled, 5–15 cm. long, densely pubescent; capsule obovate, 3-winged, 1–1.5 cm. long, the wings at length separating. [*P. frutescens glabrata* of Millspaugh.]

Thickets, St. Croix;—Cuba; Trinidad; continental tropical America. Perhaps introduced in St. Croix, but locally abundant; specimens collected there by Ricksecker were recorded by Millspaugh as perhaps cultivated.

3. **CARDIOSPERMUM** L. Sp. Pl. 366. 1753.

Vines, with alternate bipinnate or decomposed leaves, and small axillary tendril-bearing corymbs of slightly irregular polygamo-dioecious flowers. Tendrils 2 to each corymb, opposite. Pedicels jointed. Sepals 4, the 2 exterior smaller. Petals 4, appendaged at the base, 2 larger and 2 smaller. Disk 1-sided; undulate. Stamens 8; filaments unequal. Ovary 3-celled; style short, 3-cleft; ovules 1 in each cavity. Capsule inflated, 3-lobed or 3-angled. Seeds glabrous with a large hilum. Cotyledons conduplicate. [Greek, heart-seed.] About 15 species of warm and temperate regions, known as BALLOON-VINE and FAROLITAS. Type species: *Cardiospermum Halicacabum* L.

Hilum of the seed cordate-bilobed; herbaceous vines.

Capsules as long as or longer than broad, 3–3.5 cm. long.

Capsules as long as or broader than long, about 1 cm. broad.

Hilum orbicular, not 2-lobed; woody vine.

1. *C. Halicacabum*.

2. *C. microcarpum*.

3. *C. corindum*.

1. *Cardiospermum Halicacabum* L. Sp. Pl. 366. 1753.

Annual or biennial, slender, glabrous or slightly pubescent, 0.6–5 m. long, usually climbing. Leaves petioled, biternate, 5–10 cm. long; segments stalked, ovate or oblong, acute or acuminate, sharply serrate; peduncles commonly longer

than the leaves; flowers white, 6–8 mm. broad; petals obovate; filaments pubescent; capsule about 3 cm. long, membranous, globose-pyriform, pubescent; seeds globose, nearly black, about 5 mm. thick, the large hilum cordate.

Banks and thickets at lower elevations; Porto Rico; St. Croix; St. Thomas:—Southeastern United States; West Indies; continental tropical America; Old World tropics. Often planted for ornament. FAROLITOS, BALLOON-VINE.

2. **Cardiospermum microcarpum** H. B. K. Nov. Gen. 5: 104. 1821.

Climbing to a length of 1.5–3 m., branched, finely pubescent, slender. Leaves thin, biternately compound, slender-petioled, 7–15 cm. long and about as broad as long, the ultimate segments ovate to lanceolate in outline, coarsely lobed, cleft or incised; peduncles slender, about as long as the leaves; corymbs several-flowered; flowers white, about 4 mm. broad, the upper petals 3 times as long as the sepals; capsule subglobose, 3-lobed, pubescent, veiny, depressed at the top, about 1 cm. thick; seeds similar to those of the preceding species but smaller.

Thickets at lower elevations, Porto Rico; Mona; Vieques; Culebrita; St. Croix; St. Thomas; St. Jan.:—Florida; Bermuda; West Indies; continental tropical America; Old World tropics.

3. **Cardiospermum corindum** L. Sp. Pl. ed. 2, 526. 1762.

Cardiospermum bipinnatum West, St. Croix 281. 1793.

Somewhat woody, perennial, climbing or trailing, up to 2 m. long or longer, pubescent or glabrate. Leaves biternately compound; leaf-segments various, ovate to oval or lanceolate, acute or obtuse, 5 mm. to 7 cm. long; corymbs several-flowered, usually exceeding the leaves; flowers white or whitish, about 8 mm. broad; petals obovate; capsule subglobose to obovoid, subchartaceous or membranous, 2–3 cm. long; seeds black, the hilum suborbicular or slightly emarginate.

Dry southwestern districts of Porto Rico; Mona; Icaos; St. Croix; St. Thomas (ex Krebs):—West Indies (except Bahamas); Texas; continental tropical America and Old World tropics.

Cardiospermum grandiflorum Sw. is recorded by Radlkofer from St. Thomas, but is otherwise known in the West Indies only in Jamaica, where there is a Parish of St. Thomas. It is sometimes planted for ornament; its large capsules are oblong, 6–7 cm. long.

4. **THYANA** Hamilt. Prodr. 36. 1825.

[*Thouinia* Poit. Ann. Mus. Paris 3: 70. 1804. Not L. 1781.]

Shrubs or trees, with alternate 3-foliolate or 1-foliolate leaves and small, mostly white, regular clustered polygamous or dioecious flowers. Calyx 4–5-parted. Petals 4 or 5, or wanting. Disk annular, lobed. Stamens 8–10, distinct, the filaments pilose. Ovary 3-lobed, 3-celled; ovules 1 in each cavity; style slender, 3-cleft or entire. Fruit samaroid, the samaras usually 3, coriaceous, at length separating from the axis. Seeds exarillate. [From the Greek name of an odoriferous tree.] About 15 species, natives of tropical America. Type species: *Thyana simplicifolia* (Poit.) Hamilt.

Leaves 3-foliolate, chartaceous; flowers 2–3 mm. broad. 1. *T. striata*,
Leaves mostly 1-foliolate, coriaceous; flowers about 4 mm. broad. 2. *T. portoricensis*.

1. **Thyana striata** (Radlk.) Britton.

Thouinia striata Radlk. in E. & P. Nat. Pfl. Fam. 3^s: 311. 1895.

A tree, up to 20 m. high, the young twigs densely puberulent, the branches glabrous. Leaves trifoliolate; petioles 2–6 cm. long; leaflets chartaceous, or sub-

membranous, obovate or oblong-obovate, serrate, strongly pinnately veined, glabrous or nearly so above, pubescent beneath, the apex acute, obtuse or acuminate, the base cuneate or narrowed; flowers 2-3 mm. broad, whitish, in dense pubescent axillary thyrsi or panicles 2-15 cm. long; pedicels 2-3 mm. long; samaras 1-2 cm. long, 4-7 mm. wide. [*Thouinia tomentosa* of Bello, not of de Candolle.]

Hillsides and forests, Porto Rico, at lower and middle elevations in moist and dry districts. Endemic. CEBOROQUILLO. GUAVA. QUIEBRA HACIA. The hard tough and heavy wood is fine-grained and light-colored

2. *Thyana portoricensis* (Radlk.) Britton.

Thouinia portoricensis Radlk. in E. & P. Nat. Pfl. Fam. 3^e: 311. 1895.

A shrub or a tree, up to 5 m. high, the young twigs densely puberulent. Leaves 1-foliolate or sometimes 3-foliolate; petioles 1-4 cm. long; leaflets coriaceous, elliptic, ovate-elliptic or obovate-elliptic, serrulate, strongly pinnately veined, glabrous or nearly so and shining above, tomentose beneath, the apex rounded or obtuse, the base mostly obtuse; flowers about 4 mm. broad, in dense pubescent thyrsi 2-5 cm. long; pedicels about 3 mm. long; samaras 12-16 mm. long, about 4 mm. wide.

Woodlands and thickets at lower elevations in the dry southwestern districts of Porto Rico. Endemic. SERRA-SUELA. Perhaps not specifically distinct from the preceding species; specimens apparently intermediate were observed in the Coamo River Valley.

5. *ALLOPHYLUS* L. Sp. Pl. 348. 1753.

Shrubs or small trees, with alternate estipulate 1-3-foliolate leaves, the leaflets broad, usually punctate or lineate, the small subglobose, somewhat irregular, polygamous or dioecious flowers in axillary, simple or compound racemes. Sepals 4, in 2 pairs, imbricated, hooded, the outer smaller than the inner. Petals 4, small, or sometimes wanting. Disk unilateral, lobed or 4-glandular. Stamens short. Ovary excentric, compressed, 2-celled or rarely 3-celled; ovules 1 in each cavity; style stout, 2-3-lobed, or styles 2 or 3. Fruit small, dry, leathery or fleshy. Seeds with a short fleshy aril; cotyledons 2-plicate. [Greek, exotic.] Eighty species or more, mostly of tropical America. Type species: *Allophylus zeylanicus* L.

Leaves 3-foliolate, the leaflets membranous, 7-20 cm. long.

1. *A. occidentalis*.

Leaves mostly 1-foliolate, the leaflets subcoriaceous, 4-10 cm. long.

2. *A. crassinervis*.

1. *Allophylus occidentalis* (Sw.) Radlk. Sitzb. Bayer. Acad. 20: 230. 1890.

Schmidia occidentalis Sw. Fl. Ind. Occ. 2: 665. 1800.

A tree, up to 10 m. high, the twigs, foliage and inflorescence pubescent. Leaves 3-foliolate; petioles rather stout, 6-12 cm. long; leaflets nearly sessile, membranous, elliptic to obovate, serrate, 7-20 cm. long, pinnately veined with the veins ascending, the apex acuminate or acute, the base narrowed or cuneate; lateral leaflets oblique; panicles slender, many-flowered, mostly shorter than the leaves; flowers whitish, about 2 mm. broad; fruit sparingly pubescent, red, 6-8 mm. long. [*A. zeylanicus* of Sessé & Mocino, not of Linnaeus.]

Woodlands, northwestern districts of Porto Rico; St. Croix; St. Thomas and St. Jan (according to Eggers);—Cuba; Hispaniola; Saba to St. Vincent; continental tropical America. PALO BLANCO. QUIEBRA HACIA.

2. *Allophylus crassinervis* Radlk. in E. & P. Nat. Pfl. Fam. 3^e: 312. 1895.

A shrub, 2-3 m. high, with slender branches, the twigs, petioles and inflorescence finely pubescent. Leaves 1-foliolate, rarely 3-foliolate; petiole 3 cm.

long or less, usually 5–12 mm. long; leaflet subcoriaceous, 10 cm. long or less, glabrous or nearly so, dentate or nearly entire, strongly pinnately veined with the veins widely spreading, ovate to elliptic or rhombic-lanceolate, the apex acute or acuminate, the base cuneate or obtuse, the upper side shining; panicles axillary, slender, sometimes longer than the leaves, loosely flowered; flowers white, 2–3 mm. broad; fruit glabrous, short-pedicelled, 6–7 mm. long.

Mountain forests of the western districts of Porto Rico:—Cuba; Hispaniola.

6. *CUPANIA* L. Sp. Pl. 200. 1753.

Trees or shrubs, with alternate petioled pinnate estipulate leaves, the leaflets alternate, the small regular polygamous flowers in large terminal panicles or paniced racemes. Sepals 4 or 5, imbricated, broad. Petals 5, accompanied by 2 broad scales. Disk annular. Stamens 8, the filaments short, the anthers oblong. Ovary 3-celled; ovules 1 in each cavity; style mostly short. Capsule subglobose or turbinate, 3-angled or 3-lobed, dehiscent. Seeds arillate. [Commemorates Francis Cupani, 1657–1710, Sicilian physician and botanist.] About 30 species, natives of tropical and subtropical America, those in Porto Rico known as GUARA. Type species: *Cupania americana* L.

Capsule subglobose, bluntly 3-angled.
Capsule acutely 3-angled or 3-lobed.

1. *C. americana*.
2. *C. triquetra*.

1. *Cupania americana* L. Sp. Pl. 200. 1753.

Cupania tomentosa Sw. Prodr. 61. 1788.

A tree, up to 20 m. high, the nearly smooth bark reddish brown, the wood soft and light brown, the twigs, petioles, leaf-rachis, inflorescence and capsules velvety-pubescent. Leaves 2–4 dm. long; petioles stout, 2–6 cm. long; leaflets 4–8, subcoriaceous, obovate or elliptic-obovate, 7–15 cm. long, dentate, glabrous or nearly so above, tomentose, at least on the veins beneath, the apex rounded, the base narrowed or obtuse, the petiolules 3–7 mm. long; inflorescence as long as the leaves or shorter; flowers white, about 3 mm. broad; capsule subglobose, obtusely trigonous, short-stipitate, 1.5–2 cm. in diameter; seeds black.

Wooded hills, river-banks and arroyos, Porto Rico at lower and middle elevations:—Cuba; Hispaniola; Martinique; Trinidad; Venezuela.

2. *Cupania triquetra* A. Rich. in Sagra, Hist. Cub. 10: 119. 1845.

A tree, up to 20 m. high, resembling the preceding species, the twigs, leaf-rachis and inflorescence tomentose. Leaves up to 3 dm. long; petioles stout, 4 cm. long or less; leaflets 4–8, subcoriaceous, obovate or oblong-obovate, 6–12 cm. long, usually nearly entire, sometimes repand-dentate, glabrous above, pubescent or tomentose beneath, the apex rounded, the base narrowed or cuneate, the petiolules 3–7 mm. long; inflorescence often longer than the leaves; flowers white, about 3 mm. broad; capsule turbinate, stipitate, sharply 3-angled or 3-lobed, short-tomentose, 1.5–2 cm. broad.

Forests, hillsides and river banks, Porto Rico, at lower and middle elevations in moist districts; St. Thomas; St. Jan.—Hispaniola; Guadeloupe; Martinique.

Cupania glabra Sw. is recorded by Urban as found by Sintenis at Farajones near Coamo; the determination of the species was from a leaf only and the tree is not otherwise known from Porto Rico or the Virgin Islands. *C. americana* is the only species inhabiting the Coamo River Valley, in so far as we could ascertain.

7. **MATAYBA** Aubl. Pl. Gulan. 1: 331. 1775.

Trees, with alternate or opposite, abruptly pinnate, estipulate leaves, the subcoriaceous leaflets alternate or opposite, the small regular polygamous or polygamo-dioecious flowers in paniced racemes. Calyx small, 4-5-toothed. Petals 4 or 5, often rudimentary. Disk annular. Stamens 8, the filiform filaments villous, the anthers oblong. Ovary 2-3-celled; ovules 1 in each cavity. Style usually short. Capsule 2-3-lobed, sessile or stipitate, dehiscent. Seeds arillate. [Guiana name.] About 40 species of tropical and subtropical America, those of Porto Rico known as *Doncella*. Type species: *Matayba guianensis* Aubl.

Leaflets obovate, the apex rounded.

1. *M. domingensis*.

Leaflets oblong, the apex acute or bluntly acuminate.

2. *M. oppositifolia*.

1. **Matayba domingensis** (DC.) Radlk. Sitzb. Bayer. Akad. 9: 535. 1879.

Ratonia domingensis DC. Prodr. 1: 618. 1824.

A tree, up to 20 m. high, with a trunk 2-3 dm. in diameter, the young twigs minutely puberulent, soon glabrous. Leaves alternate or some of them opposite; leaflets 2-8, mostly opposite, entire, obovate, 4-8 cm. long, glabrous, pellucid-punctate, short-stalked, the apex rounded, the base narrowed or cuneate; panicles lateral, puberulent, mostly shorter than the leaves; pedicels about 3 mm. long; calyx deeply lobed, the lobes triangular; petals only 0.5 mm. long, pubescent; filaments 2-3 mm. long; stigmas 2 or 3; capsule obcordate, 2-3-lobed, about 1 cm. long, nearly black, stipitate.

Mountain forests, Porto Rico:—Cuba; Hispaniola. The wood is red, hard, strong and heavy. TEA CIMARRONA. RATON.

2. **Matayba oppositifolia** (A. Rich.) Britton

Cupania oppositifolia A. Rich. in Sagra, Hist. Cub. 10: 292. 1845.

Matayba apetala forma *oppositifolia* Radlk. In Urban, Symb. Ant. 1: 354. 1899.

A tree, similar to the preceding species. Leaflets oblong to elliptic-lanceolate, 8 cm. long or less, short-stalked or nearly sessile, glabrous, the apex acute or obtusely acuminate, the base narrowed; panicles as long as the leaves or shorter; flowers and fruit closely resembling those of *M. domingensis*.

Mountain forests, Porto Rico, but only barren specimens have been collected:—Cuba; Honduras.

8. **SAPINDUS** L. Sp. Pl. 367. 1753.

Trees or shrubs, the leaves alternate, mostly odd-pinnate. Flowers regular, polygamo-dioecious, in racemes or panicles. Sepals 4 or 5, imbricated in 2 rows. Petals of the same number, each with a scale at its base. Disk annular, hypogynous. Stamens 8-10, inserted on the disk; anthers versatile. Ovary commonly 3-lobed, with the same number of cavities; ovules 1 in each cavity, ascending; style slender; stigma 2-4-lobed. Fruit a globose or lobed berry with 1-3 seeds. [Name, *Sapo Indicus*, Indian soap, from the soapy quality of the berries.] About 10 species, natives of warm and tropical Asia and America, the following typical:

1. *Sapindus saponaria* L. Sp. Pl. 367. 1753.

Sapindus inaequalis DC. Prodr. 1: 608. 1824.

Sapindus stenopterus DC. Prodr. 1: 608. 1824.

A tree, up to 20 m. high, usually lower, the thick gray bark separating in thin scales, the young twigs puberulent, becoming glabrous. Leaves 2-4 dm. long, somewhat pubescent when young, the petioles rather stout, 8 cm. long or less, the rachis wing-margined between the leaflets or wingless; leaflets chartaceous, various, oblong to lanceolate, 3-15 cm. long, often falcate, sessile or short-stalked, acute, acuminate or obtuse; panicles usually large, many-flowered, puberulent, often as long as the leaves or longer; flowers white, 5-6 mm. broad; petals obovate; fruit globular, brown, shining, 1-2 cm. in diameter, the pulp thin, translucent.

Plains and woodlands at lower elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—Florida; Bahamas; Jamaica; Cuba; Hispaniola; Guadeloupe; Grenada; Margarita; Curaçao; continental tropical America. JABONCILLO. SOAPBERRY. SOAP TREE. The hard, light brown wood has a specific gravity of about 0.8.

Sapindus frutescens Aubl., of Gulana, was recorded by Krebs from St. Thomas, apparently in error.

9. **MELI COCCA** L. Sp. Pl. ed. 2, 495. 1762.

Trees, with alternate estipulate equally pinnate leaves, and small polygamous or dioecious, regular flowers in compound or simple racemes at the ends of the branches. Calyx 4-5-lobed, the lobes nearly orbicular, thin, imbricated. Petals 4 or 5, obovate or orbicular. Disk flattened, 4-5-lobed. Stamens 8; filaments filiform, distinct, glabrous; anthers small. Ovary 2-3-celled; ovules 1 or 2 in each cavity; style short; stigma 2-3-lobed. Fruit a somewhat fleshy drupe. Seed erect, the testa coriaceous, the aril large, pulpy; cotyledons thick. [Greek, honey-berry.] Two known species, the following typical, the other South American.

1. *Melicocca bijuga* L. Sp. Pl. ed. 2, 495. 1762.

A large tree, sometimes becoming 25 m. high, with a trunk up to 1.7 m. in diameter, the smooth bark brown, the branches spreading, the slender twigs, the leaves and the inflorescence glabrous. Leaves petioled; rachis winged or wingless; leaflets 2 pairs, opposite, elliptic or ovate-elliptic, thin, 4-10 cm. long, mostly acute or acuminate at the apex, obliquely narrowed at the base, sessile, pinnately veined; racemes narrow, many-flowered, 6-10 cm. long, often numerous in terminal panicles; pedicels spreading, 4-6 mm. long; flowers very fragrant; calyx-segments about 2 mm. long; petals obovate, obtuse, greenish white, ciliate, 3-4 mm. long; drupe green, edible, pleasantly acid, subglobose, 2-4 cm. in diameter.

Occasionally spontaneous after planting in Porto Rico; St. Croix; St. Thomas; St. Jan.—Widely naturalized in the West Indies, planted for its edible fruit and for shade; native of continental tropical America. GUENEP. GINEP. SPANISH LIME. JAMAICA BULLACE PLUM. KANAPPY.

10. **EXOTHEA** Macf. Fl. Jam. 1: 232. 1837.

Trees or shrubs, with alternate petioled evenly pinnate leaves, and small white somewhat irregular, dioecious or polygamous, paniced flowers. Sepals 5, partly united, imbricated. Petals 5, short-clawed, unappendaged. Stamens 7 or 8, those of staminate flowers about as long as the petals, those of pistillate flowers shorter. Ovary 2-celled, sessile; ovules 2 or 3 in each cavity; style very short, simple, the stigmas glabrous. Fruit a small globose berry-like drupe, the

exocarp slightly fleshy. Seed exarillate. [Greek, to expel, the genus having been taken from *Melicocca*.] The genus is probably monotypic. Type species: *Exothea oblongifolia* Macf.

1. ***Exothea paniculata*** (Juss.) Radlk.; Durand Index Gen. Phan. 81. 1888.

Melicocca paniculata Juss. Mem. Mus. Paris 3: 187. 1817.

Hypelate paniculata Camb. Mem. Mus. Paris 18: 32. 1829.

Exothea oblongifolia Macf. Fl. Jam. 1: 232. 1837.

A tree, attaining a maximum height of about 20 m., with a trunk up to 5 dm. thick, the thin, reddish-brown bark smooth, at length scaly. Leaves short-petioled; leaflets 2, 4, or 6 (rarely 1 or 3), oblong to elliptic-obovate, 5–13 cm. long, glabrous or nearly so, entire, dark green and shining above, pale green beneath, acute, obtuse or emarginate at the apex, narrowed to the nearly sessile base; panicles terminal and axillary, pubescent; sepals ovate, about 3 mm. long; petals oblong-ovate, about as long as the sepals; ovary pubescent; drupes 10–13 mm. in diameter, purple, the juicy pulp orange.

Hillsides and arroyos at lower elevations in dry and moist districts, Porto Rico; Mona; Vieques:—Florida; Bahamas; Jamaica; Cuba; Hispaniola; St. Eustatius, St. Vincent; Guatemala. GAITA. GUACARAN. IRONWOOD. BUTTER BOUGH. The hard wood is reddish brown, used in cabinet work, and for handles of tools; its specific gravity is about 0.95.

11. **HYPELATE** P. Br.; Sw. Prodr. 61. 1788.

A tree or shrub, with alternate 3-foliolate petioled leaves, and small, white or greenish white, paniced, monoecious or polygamo-dioecious flowers. Sepals 5, imbricated. Petals 5, unappendaged, sessile. Stamens 8–10 in the staminate flowers, wanting or imperfect in the pistillate; filaments glabrous. Pistillate flowers with a 3-celled, sessile ovary, the style short, the stigmas capitate; ovules 2 in each cavity, superimposed. Fruit a small drupe, with thin flesh. [Greek name for *Ruscus*, the Butcher's Broom.] A monotypic genus.

1. ***Hypelate trifoliata*** Sw. Prodr. 61. 1788.

A tree, sometimes 13 m. high with a trunk up to 5 dm. in diameter, usually smaller, sometimes shrubby, the thin gray bark smooth or nearly so. Petioles 1–5 cm. long; leaflets obovate or spatulate, firm in texture, 2–5 cm. long, entire, glabrous, shining above, rather dull beneath, finely veined, the apex obtuse, emarginate or acutish; sepals ovate, ciliate; petals suborbicular, about 2 mm. long, ciliate, about as long as the sepals; drupes ovoid, black, 5–7 mm. long.

Woodlands and thickets, southwestern dry districts of Porto Rico; Mona; Icacos:—Florida; Bahamas; Cuba; Hispaniola; St. Martin; Anguilla. WHITE IRONWOOD. The dark brown wood is heavy, hard and durable, with a specific gravity of about 0.95.

Blighia sapida Koen., AKEE, African, planted for its fruit in Porto Rico and the Virgin Islands, is a large tree with pinnate leaves of 6 or 8 rather thin, oblong entire leaflets 6–10 cm. long, and small white flowers in axillary panicles, the petals 5, the stamens 8; the fruit is a fleshy capsule 7–10 cm. long, bluntly 3-angled, which splits and exposes the large black seeds with a white edible aril. [*Cupania sapida* Voigt.]

Family 11. **SABIACEAE** Lindl.

SABIA FAMILY.

Trees or shrubs, with alternate, simple or pinnate, estipulate leaves, the mostly small, perfect flowers, paniced, cymose, or solitary. Calyx 3–5-

parted, the sepals imbricated. Petals 4 or 5, imbricated. Stamens 4 or 5, opposite the petals, with didymous anthers. Ovary sessile, 2-3-celled, ovules 2 in each cavity. Fruit drupaceous, dry or fleshy, indehiscent. Seeds compressed or globose, with little endosperm or none, the cotyledons plicate. About 70 species, of tropical distribution, grouped in 4 genera.

1. **MELIOSMA** Blume, Cat. Gew. Buitenz. 10. 1823.

Trees or shrubs, more or less pubescent, the leaves of West Indian species simple, mostly entire, pinnately veined, the flowers paniculate, the sepals 5. Petals 5, unequal, the 3 outer ones broader than the 2 inner. Stamens 5, those opposite the 3 larger petals with flattened filaments without anthers, those opposite the 2 smaller petals antheriferous; anthers longitudinally or transversely dehiscent. Disk annular, dentate or wanting. Ovules horizontal or pendulous; styles 2, connate; stigmas 2. Drupe subglobose or oblong. [Greek, honey-odor.] About 45 species, of tropical distribution. Type species: *Millingtonia simplifolia* Roxb.

Leaves obovate, rounded; anther-sacs longitudinally dehiscent; drupe about 1 cm. long. 1. *M. obtusifolia*.
Leaves elliptic to elliptic-obovate, acute or acuminate or some of them obtuse; anther-sacs transversely dehiscent; drupe 1.5-2 cm. long. 2. *M. Herberti*.

1. **Meliosma obtusifolia** (Bello) Krug & Urban, Ber. Deutsche Bot. Ges. 13: 216. 1895.

Atelandra obtusifolia Bello, Anal. Soc. Esp. Hist. Nat. 10: 289. 1881.

A tree, up to 20 m. high, the young twigs and the inflorescence puberulent. Leaves alternate, opposite or some of them ternate, glabrous, obovate, 8-20 cm. long, subcoriaceous, the apex rounded, the base narrowed or cuneate, the petioles 1-3 cm. long; panicles large, terminal and in the upper axils, often longer than the leaves, the branches slender; flowers subglomerate; sepals nearly orbicular, about 1 mm. long; petals whitish, the larger ones about 2.5 mm. long; drupe white, turning black, subglobose, about 1 cm. long.

Mountain forests, Porto Rico. Endemic. CACAILLO. CIRALILLO. GUAYAROTO.

2. **Meliosma Herberti** Rolfe, Kew Bull. 1893: 244. 1893.

Atelandra laurina Bello, Anal. Soc. Esp. Hist. Nat. 10: 289. 1881. Not *M. laurina* Blume.

A tree, up to 20 m. high or higher, the twigs and inflorescence densely short-pubescent. Leaves alternate, elliptic or elliptic-obovate, glabrous or the veins short-pubescent, 18-25 cm. long, subcoriaceous, the apex acute, acuminate or sometimes obtuse, the base narrowed or cuneate, the petioles 1.5-4 cm. long; panicles large, terminal and in the upper axils, often as long as the leaves, the branches rather short; sepals suborbicular, about 1.5 mm. long; larger petals 1-1.5 mm. long; drupe globose to obovoid, white, turning violet to black, 1.5-2 cm. long.

Forests, Porto Rico, mostly at higher elevations; Tortola.—Guadeloupe to Grenada. The leaves of shoots are sometimes coarsely dentate. CACAO BOBO. AGUACATILLO.

Order 16. **RHAMNALES**.

Shrubs, vines or small trees, with alternate or sometimes opposite leaves. Flowers small, regular. Sepals mostly more or less united. Petals distinct or wanting. Stamens as many as the sepals or calyx-lobes and alternate with

them, opposite the petals when these are present. Ovary compound, superior; ovules erect.

Shrubs, small trees or vines; petals 4 or 5, or none; fruit a drupe or capsule.
Vines, climbing by tendrils, rarely shrubs; petals caducous; fruit a berry.

Fam. 1. RHAMNACEAE.

Fam. 2. VITACEAE.

Family 1. **RHAMNACEAE** Dumort.

BUCKTHORN FAMILY.

Erect or climbing shrubs, or small trees, often thorny. Leaves simple, stipulate, mainly alternate, often 3-5-nerved. Stipules small, deciduous. Inflorescence commonly of cymes or panicles. Flowers small, regular, perfect or polygamous. Calyx-limb 4-5-toothed or 4-5-lobed. Petals 4 or 5, inserted on the calyx, or none. Stamens 4 or 5, inserted with the petals and opposite them; anthers short, versatile. Disk fleshy. Ovary sessile, free from or immersed in the disk, 2-5- (often 3-) celled; ovules 1 or 2 in each cavity, anatropous. Fruit often 3-celled. Seeds solitary in the cavities, erect; endosperm fleshy, rarely none; embryo large; cotyledons flat. About 50 genera and 600 species, of temperate and tropical regions.

Fruit drupe-like.

Stone 1-3-celled.

Leaves pinnately-veined.

Endosperm ruminated; pit of the drupe thick-walled.

Endosperm none; pit of the drupe thin-walled.

Leaves 3-5-ribbed from the base in the species within our range.

Inflorescence paniculate; disk undulate.

Inflorescence cymose; disk 5-10 lobed.

Stones 2-4, separate.

Fruit dry, capsule-like, the carpels separating.

Shrubs or trees; fruit capsular, not crowned with the calyx.

Unarmed shrubs or trees; calyx-lobes deciduous.

Spiny-armed shrubs; calyx-lobes persistent.

Woody vines; fruit winged, crowned with the calyx.

1. *Reynosia*.2. *Krugiodendron*.3. *Sarcophalus*.4. *Zizyphus*.5. *Rhamnus*.6. *Colubrina*.7. *Ilyosperma*.8. *Gouania*.1. **REYNOSIA** Griseb. Cat. Pl. Cub. 33. 1866.

Shrubs or small trees, with entire short-petioled opposite leaves, and small perfect yellowish green flowers in axillary clusters. Calyx-lobes valvate, spreading. Disk fleshy. Petals present or none. Stamens 5; filaments subulate. Ovary 2-3-celled; styles short and thick; stigma 2-3-lobed; ovules 1 in each cavity, erect. Fruit a drupe with thin flesh. [Dedicated to Alvaro Reynoso, a Cuban chemist and agriculturist, who died in 1888.] About 9 species, of the West Indies and Florida. Type species: *Reynosia retusa* Griseb.

Leaves 1-2.3 cm. long, 0.6-1.4 cm. broad, the midrib produced into a recurved cusp.

1. *R. uncinata*.

Leaves 3.5-8 cm. long, 2-6 cm. broad, the midrib sometimes minutely excurrent.

Leaves ovate, obtuse.

Leaves elliptic to oval, rounded or emarginate.

2. *R. Krugii*.3. *R. Guama*.1. **Reynosia uncinata** Urban, Symb. Ant. 1: 355. 1899.

A shrub 1.5-3 m. tall, or a small tree, the young twigs minutely pilose, soon becoming glabrous, the stipules triangular-lanceolate, 1.5-2 mm. long. Leaves obovate, oblong-oval or oval, rigid-coriaceous, 1-2.3 cm. long, 0.6-1.4 cm. broad, rounded or subtruncate and sometimes emarginate at the apex, obtuse or rounded at the base, glabrous and reticulate-veined on both sides, the midrib impressed above, prominent beneath and produced into a recurved cusp; petioles 1-2 mm.

long; flowers long-pedicelled; calyx-lobes triangular, about 2 mm. long; petals broadly obovate or suborbicular, 1.5 mm. long, 1.2–1.5 mm. broad; drupe subglobose, 12–15 mm. long, 11–13 mm. in diameter. [*R. mucronata* of Eggers, not of Grisebach.]

Rocky soil in the dry southwestern districts, Porto Rico; Mona; St. Croix; Tortola; Aneгада:—Anguilla. CHICHARRON.

2. **Reynosia Krugii** Urban, Symb. Ant. 1: 354. 1899.

A tree, 10 m. tall, the young twigs minutely puberulent, soon becoming glabrous, the stipules triangular-lanceolate, 1.5–1.8 mm. long. Leaves ovate, subcoriaceous, 5–8 cm. long, 2.5–5 cm. broad, obtuse or obtusely acuminate at the apex, rounded or subtruncate at the base, glabrous and finely reticulate-veined on both sides, the midrib strongly impressed above, prominent beneath and sometimes minutely excurrent, the petioles slender, 5–7 mm. long; flowers slender, pedicelled; calyx 1.5 mm. long, its lobes triangular, short-acuminate; petals transversely elliptic, 0.5 mm. long; filaments about 0.5 mm. long, the anthers orbicular, drupe oval, 15 mm. long, 10 mm. in diameter.

On the coast near Fajardo and in woodlands, Pedro Avila, near Cayey, Porto Rico. Endemic.

3. **Reynosia Guama** Urban, Symb. Ant. 1: 356. 1899.

A glabrous tree, sometimes 6 m. tall, the twigs grayish brown, the stipules triangular, about 1.8 mm. long. Leaves elliptic to oval, coriaceous, 3.5–8 cm. long, 2.5–6 cm. broad, rounded and notched at the apex, rounded and occasionally subcordate at the base, reticulate-veined on both sides, the midrib impressed above, prominent beneath and sometimes minutely excurrent; petioles about 6 mm. long; inflorescence subspicate; pedicels 4–6 mm. long; calyx-lobes triangular-ovate, 1.8 mm. long, acuminate; petals 1 mm. or more broad, broader than long, notched at the apex, anthers ovate; fruit globose-ellipsoid. [*R. latifolia* of Eggers, not of Grisebach.]

Hillside thickets, St. Thomas; St. Jan; Virgin Gorda. Endemic. GUAMA.

2. **KRUGIODENDRON** Urban, Symb. Ant. 3: 313. 1902.

An unarmed evergreen tree or shrub, with entire short-petioled leaves, and small perfect flowers subumbellate in the axils. Calyx mostly 5-parted, the lobes longer than the tube. Petals wanting. Stamens as many as the calyx-lobes; filaments subulate; anthers obtuse. Disk annular, crenate. Ovary short-conic; style short; stigmas 2, small; ovules 2. Drupe small, ovoid, the pit thin-walled. Testa of the seed adherent to the endocarp; cotyledons semi-globose, fleshy; endosperm none. [Greek, Krug's tree, in honor of Leopold Krug, a student of the West Indian flora.] A monotypic genus.

1. **Krugiodendron ferreum** (Vahl) Urban, Symb. Ant. 3: 314. 1902.

Rhamnus ferreus Vahl in West, St. Croix 276. 1793.

Ceanothus ferreus DC. Prodr. 2: 30. 1825.

Scutia ferrea Brongn. Ann. Sci. Nat. I. 10: 363. 1827.

Cudalia ferrea Griseb Fl. Br. W. I. 100. 1859.

A tree, attaining a maximum height of about 10 m., with a trunk diameter up to 5 dm., usually much smaller, often shrubby, the bark ridged, the branches spreading, the young twigs puberulent. Leaves mostly opposite, ovate to oval, rather thin, 2–7 cm. long, 1.5–4.5 cm. broad, obtuse to emarginate at the apex, rounded or narrowed at the base, bright green above, dull beneath, nearly

glabrous when mature, the petioles 3-6 mm. long; flowers yellow-green, 4 mm. wide, in axillary clusters much shorter than the leaves; calyx-lobes triangular-ovate; stamens a little shorter than the calyx; drupes globose or ovoid, black, 5-8 mm. long. [*Sarcomphalus laurinus* Stahl, not Grisebach; *S. retusus* of Cook and Collins.]

Thickets, woodlands and hillsides at lower elevations, mostly in dry districts, Porto Rico; Mona; Desecheo; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—Florida; West Indies, south to St. Vincent; Bonaire. PALO DE NIERRO. BARIACO. ESPEJUELO. BLACK IRONWOOD. EBONY WOOD.

3. *SARCOMPHALUS* P. Br.; Raf. Sylva Tell. 29. 1838.

Shrubs or trees, often spinescent with flat palmately or pinnately veined coriaceous petioled leaves, and small perfect bractless flowers in terminal panicles. Calyx 5-cleft, the lobes spreading. Petals 5, with a slender claw and a hooded limb. Disk undulate. Stamens 5, distinct, not longer than the petals; anthers extrorse. Ovary immersed in the disk, ovoid, superior; styles 2 or 3; stigma obtuse. Fruit a small, nearly dry, ovoid or ellipsoid drupe, the bony pit 2-celled, 2-seeded. [Greek, fleshy navel.] About 8 species, natives of the West Indies. Type species: *Sarcomphalus retusus* Raf.

Leaves glabrous, finely reticulate-veined; inflorescence and calyx glabrous. 1. *S. domingensis*.
Leaves ferruginous-pubescent beneath, coarsely reticulate-veined; inflorescence and calyx tomentulose. 2. *S. reticulatus*.

1. *Sarcomphalus domingensis* (Spreng.) Krug & Urban; Urban, Symb. Ant. 1: 357. 1899.

Cassine domingensis Spreng. Syst. 1: 939. 1825.

Zizyphus Rignonii Delp. Mem. Acad. Tor. 14: 404. 1854.

A tree, sometimes 10 m. high, with glabrous dark brown or grayish angled twigs, unarmed, or armed with slender prickles 4-10 mm. long. Leaves elliptic to orbicular, coriaceous, 3-10 cm. long, 2.5-9.4 cm. broad, rounded at the apex, rounded and often cordate at the base, glabrous and finely reticulate-veined on both surfaces, entire; petioles 4-8 mm. long; calyx glabrous, the lobes triangular, 2 mm. long; petals 1.3 mm. long, the blade less than 1 mm. in diameter; fruit subglobose or ellipsoid, 9-13 mm. in diameter, dark brown.

Porto Rico, collected by Bertero; Icacos; Vieques; Tortola; Virgin Gorda; Anegada:—Hispaniola; Anguilla.

2. *Sarcomphalus reticulatus* (Vahl) Urban, Symb. Ant. 1: 357. 1899.

Paliurus reticulatus Vahl, Eclog. 3: 6. 1807.

Zizyphus reticulatus DC. Prodr. 2: 20. 1825.

A shrub, 2-4 m. high, or tree up to 10 m., with gray nearly smooth bark, the twigs angled, usually clothed with a ferruginous tomentum, unarmed, or armed with slender brownish prickles 7 mm. or more long. Leaves elliptic to suborbicular, occasionally somewhat ovate, rather brittle, 2.5-6 cm. long, 1.5-5.5 cm. broad, rounded at the apex, rounded and often subcordate at the base, palmately veined, glabrous or pubescent above, the veins more or less impressed, ferruginous-pubescent beneath and rather coarsely reticulate-veined, the margin entire or minutely toothed; petioles 2-5 mm. long; calyx ferruginous-tomentose, its lobes triangular, acute, 1.5 mm. long; petals 1.5 mm. long, the blade less than 1 mm. in diameter; filaments subulate, the anthers elliptic; fruit subglobose, 1 cm. or more in diameter, brown. [*Rhamnus rotundifolia* of Sessé and Moçino, not of Persoon; *Zizyphus havanensis* of Bello, not of H. B. K.]

Thickets, hillsides and plains at lower elevations in the dry southern districts, Porto Rico; Muertos; St. Croix, Tortola:—Hispaniola. CACAO-ROJO. ESPEJUELO

Sarcophilus Sarcophilus (L.) Britton, a tree endemic in Jamaica, was erroneously listed by Krebs as found in St. Thomas [*Rhamnus Sarcophilus* L.; *Ceanothus Sarcophilus* DC.].

4. **ZIZYPHUS** [Tourn.] Mill. Gard. Dict. Abr. ed. 4. 1754.

Trees or shrubs, or sometimes vine-like, the branches unarmed, or armed with mostly short, straight or recurved stipular prickles. Leaves alternate, 3-5-ribbed from the base, serrate or entire. Flowers fascicled, or in sessile or peduncled cymes. Calyx 5-lobed. Petals 5, hooded, rarely none. Disk 5-10-lobed. Stamens 5. Ovary immersed in the disk, 2-4-celled; styles 2-4, free or more or less united. Fruit fleshy or dry, with a woody or bony 1-4-seeded 1-4-celled stone. [The Arabian name.] About 40 species, distributed throughout the tropical and subtropical regions of both hemispheres. Type species: *Rhamnus Zizyphus* L.

1. **Zizyphus Jujuba** (L.) Lam. Encyc. 3: 318. 1789.

Rhamnus Jujuba L. Sp. Pl. 194. 1753.

A tree, up to 15 m. high, the twigs, petioles and inflorescence clothed with a dense brownish tomentum, the branches unarmed, or armed with short straight or recurved prickles. Leaves ovate, elliptic, or broadly oval, 3.5-7 cm. long, 2-6 cm. broad, usually rounded at the apex, acute or rounded at the base, dark green and glabrous above, tawny or white-tomentose beneath, the margin finely toothed, the petioles 0.5-1.5 cm. long; flowers in short-stalked axillary cymes, slender-pedicelled; calyx-lobes triangular, acute, 1.7-2 mm. long; petals spatulate-obovate, about 1.7 mm. long; fruit subglobose or ellipsoid, 1.2-1.7 cm. in diameter.

Coastal thickets and clearings, Culebra; Vieques; cultivated in the Virgin Islands; also in Florida, the West Indies and continental tropical America, and locally naturalized. Native of the tropics of the Eastern hemisphere.

Zizyphus mauritiana Lam., also of Old World tropics, was seen as young plants at the Insular Experiment Station, Rio Piedras, Porto Rico, in 1924; it is similar to *Z. Jujuba*, but the leaves are densely woolly beneath.

5. **RHAMNUS** [Tourn.] L. Sp. Pl. 193. 1753.

Shrubs or small trees, with pinnately veined leaves, and small axillary cymose, racemose or paniculate, perfect, polygamous, or dioecious flowers. Calyx-tube urceolate, its limb 4-5-toothed. Petals 4 or 5, mainly emarginate and hooded, or none. Disk free from the 3-4-celled ovary. Style 3-4-cleft. Drupe berry-like, containing 2-4 nutlets. Seeds mainly obovoid; endosperm fleshy. [The ancient Greek name.] About 75 species, of temperate and warm regions. Type species: *Rhamnus cathartica* L.

1. **Rhamnus sphaerosperma** Sw. Prodr. 50. 1788.

Ceanothus sphaerocarpus DC. Prodr. 2: 30. 1825.

Frangula sphaerocarpa Griseb. Fl. Br. W. I. 99. 1859.

A shrub or medium size tree, the young twigs pubescent with ferruginous hairs. Leaves oblong-elliptic, elliptic-lanceolate or ovate, 6-17 cm. long, 2.4-7.3 cm. broad, acuminate at the apex, rounded and occasionally subcordate at the base, glabrous or sparingly pilose on the veins on both sides, reticulate-veined; petioles 0.5-2 cm. long; calyx pilose, its lobes triangular, acute, about 2 mm. long;

petals broader than long, deeply notched at the apex; fruit (mature ?) subglobose or globose-obovoid, 5 mm. in diameter.

Mountain forests, Porto Rico.—Cuba; Jamalca; Hispaniola. WEST INDIAN BUCKTHORN.

Rhamnus glabratus West, of St. Croix, is not understood by modern botanists.

6. **COLUBRINA** Rich.; Brongn. Ann. Sci. Nat. I. 10: 368. 1827.

Trees or shrubs, with alternate petioled leaves, and small perfect yellow or greenish flowers in axillary clusters. Calyx-tube hemispheric, the 5 lobes spreading. Disk angled or lobed. Petals 5, hooded. Stamens 5, the short filaments slender. Ovary immersed in the disk 3-celled, ovules 1 in each cavity; styles 3, united below; stigmas blunt. Fruit slightly 3-lobed, the carpels separating septically and each dehiscent along the inner edge. Seeds smooth and shining, the endosperm thin. [Latin, coluber, a serpent.] About 15 species, 1 of them Asiatic, the others of tropical America. Type species: *Colubrina ferruginosa* Brongn.

Twigs and under surface of the leaves pubescent with light brown hairs or glabrous.

Twigs and under surface of the leaves clothed with a reddish brown tomentum.

1. *C. reclinata*.

2. *C. colubrina*.

1. **Colubrina reclinata** (L'Her.) Brongn. Ann. Sci. Nat. I. 10: 369. 1827.

Ceanothus reclinatus L'Her. Sert. Angl. 6. 1788.

Rhamnus ellipticus Sw. Prodr. 50. 1788.

A tree, sometimes 20 m. high with a trunk diameter up to 1.5 m., usually much smaller, with orange-brown furrowed bark which exfoliates in thin layers, the young twigs finely pubescent. Leaves elliptic to ovate-lanceolate, rather thin, 3-9 cm. long, 2-5 cm. broad, acute or bluntish at the apex, rounded or narrowed at the base, the slender petioles 5-15 mm. long; flower-clusters pubescent, as long as the petioles or shorter; calyx-lobes acute; petals hooded, shorter than the calyx-lobes; style slender; fruit globose, orange-red or brownish, 7-9 mm. in diameter; seeds oblong-ellipsoid or somewhat ovoid, 3.5-5 mm. long, 2.7-3 mm. broad, brownish black.

Woodlands and thickets at lower elevations in the dry southwestern districts, Porto Rico; Culebra, St. Croix; St. Thomas; St. Jan; Tortola; Anegada:—Florida; West Indies south to St. Vincent; Venezuela. The wood is hard, dark brown, strong, with a specific gravity of about 0.8. MABL. SMOOTH SNAKE-BARK. MAABEE. NAKED-WOOD.

2. **Colubrina colubrina** (Jacq.) Millsp. Field Mus. Bot. 2: 69. 1900.

Rhamnus colubrinus Jacq. Enum. 16. 1760.

Colubrina ferruginosa Brongn. Ann. Sci. Nat. I. 10: 369. 1827.

Ceanothus colubrinus Lam. Tabl. Encycl. 2: 90. 1793.

A shrub or tree, 8 m. high or less, rarely up to 20 m., the twigs and young leaves ferruginous-tomentulose. Leaves ovate to elliptic, subcoriaceous, 5-15 cm. long, 2.5-7.5 cm. broad, obtusish, acute or short-acuminate at the apex, rounded or subcordate at the base, the upper surface glabrous when mature, the under surface permanently tomentulose; petioles tomentulose, 5-20 mm. long; flower-clusters mostly shorter than the petioles; calyx-lobes ovate, obtuse; petals spatulate, yellow, shorter than the calyx-lobes, notched; fruit obovoid-globose, 6.5-8 mm. in diameter, nearly black; seeds elliptic to suborbicular, 3-3.5 mm. in diameter.

Woodlands, hillsides and thickets at lower and middle elevations in dry and moist districts, Porto Rico; Mona; Icacos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan;

Tortola; Virgin Gorda; Anegada:—Florida; West Indies south to Antigua; Barbados. [*Colubrina ferruginea* of Bello.] The yellowish brown wood is hard, durable and strong, with a specific gravity of about 0.7; it is sometimes used in construction. ABEJUELO. ACHIOTILLO. RATON. SNAKE-BARK. GREEN-HEART. SOAP-TREE.

7. **HYBOSPERMA** Urban, Symb. Ant. 1: 358. 1899.

Shrub with alternate leaves, the twigs armed with prickles. Flowers long-pedicelled, commonly solitary in the axils of the leaves. Calyx 5-parted. Petals 5, hooded. Stamens 5. Ovary immersed in the disk, 3-celled; ovules 1 in each cavity. Styles 3, united. Fruit capsular, 3-carpellary, the carpels dehiscent to the middle. Seeds solitary in each cell, keeled; testa smooth, thick, coriaceous; cotyledons obovate or suborbicular, thick. [Greek, humped seed.] A monotypic genus.

1. **Hybosperma spinosum** Urban, Symb. Ant. 1: 358. 1899.

A shrub, 1.5–5 m. tall, with slender grayish ferruginous-pubescent twigs armed with slender grayish prickles 6–12 mm. long, the stipules ovate-oblong, acute, 1–1.5 mm. long. Leaves obovate or oval, 5–11.5 mm. long, 4–8 mm. broad, rounded or subtruncate and often notched at the apex, obtuse at the base, glabrous at maturity, reticulate-veined, the petioles 1 mm. long or less; pedicels 2.5–6.5 mm. long, rusty pubescent; calyx rusty pubescent, its lobes ovate or triangular-ovate, acuminate, 2 mm. long, 1.2–1.5 mm. broad; petals 1.8 mm. long; capsule 5 mm. long, apiculate; seed olive-brown, 4 mm. long, 3 mm. broad.

Thickets on the rocky summit of Mount El Mariel, Guanica, Porto Rico:—Hispaniola.

S. **GOUANIA** Jacq. Stirp. Sel. Am. 263. 1763.

Woody vines, climbing by tendrils, with alternate petioled leaves, and small polygamous flowers in paniced spikes or narrow racemes. Calyx obconic, with 5 spreading lobes. Disk 5-angled or 5-horned. Petals 5, hooded. Stamens 5, short. Ovary immersed in the disk, 3-celled; ovules 1 in each cavity; styles 3, united at the base; stigmas very small. Fruit dry, 3-winged, separating into 3 nutlets. Seeds shining. [Commemorates Antoine Gouan, 1733–1821, professor in Montpellier.] About 40 species of tropical and subtropical regions. Type species; *Gouania tomentosa* Jacq.

Leaves usually glabrous or nearly so beneath, the primary veins tapering at the margins; wings of the mature fruit attached to the body throughout their length.

Leaves usually tomentose beneath, the primary veins of nearly equal thickness throughout; wings of the mature fruits attached to the side of the body only.

1. *G. lupuloides*.

2. *G. polygama*.

1. **Gouania lupuloides** (L.) Urban, Symb. Ant. 4: 378. 1910.

Banisteria lupuloides L. Sp. Pl. 427. 1753.

Rhamnus domingensis Jacq. Enum. 17. 1760.

Gouania domingensis L. Sp. Pl. ed. 2, 1663. 1763.

Gouania glabra Jacq. Stirp. Sel. Am. 264. 1763.

Gouania lupuloides aptera Urban, Symb. Ant. 4: 378. 1910.

Lupulus lupuloides domingensis Kuntze, Rev. Gen. Pl. 119. 1891.

A woody vine, sometimes 7 m. long, climbing by coiled tendrils, the branches glabrous below, loosely pubescent above. Leaves ovate to elliptic, thin, 3–10 cm. long, 1.8–6.5 cm. broad, glabrous or sparingly pubescent, serrate with blunt teeth, acute or short-acuminate at the apex, subcordate or rounded at the base, the petioles 5–15 mm. long; racemes slender, pubescent, 5–18 cm. long; pedicels

clustered, pubescent, 1-3 mm. long; calyx pubescent, 1-1.5 mm. long; petals yellow, ovate, acute; fruit 8-12 mm. broad including the wings which are broader than the body, rarely wingless; seeds broadly elliptic to oval, 3-3.5 mm. long, dark-brown, shining. [*Reissekia smilacina* of Stahl, not Endl.]

Woodlands and thickets at lower and middle elevations in moist or wet districts, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; West Indies south to Grenada; continental tropical America. CHEW-STICK. SOAP-STICK.

2. ***Gouania polygama*** (Jacq.) Urban, Symb. Ant. 4: 378. 1910.

Rhamnus polygamus Jacq. Enum. 17. 1760.

Gouania tomentosa Jacq. Sel. Stirp. Am. 263. 1763.

Lupulus lupuloides tomentosus Kuntze, Rev. Gen. Pl. 119. 1891.

A vine, sometimes 7 m. or more long, the branches tomentose. Leaves oblong-ovate to broadly oval, 5-14 cm. long, 2.5-8 cm. broad, tomentose beneath, crenate-serrate, acute to acuminate, or occasionally rounded at the apex, subcordate to rounded at the base, the primary veins of nearly equal thickness throughout, the petioles 0.8-1.8 cm. long, tomentulose; calyx tomentose, about 1.5 mm. long; fruit 8-13 mm. broad, including the wings; seed ovoid or elliptic, 2-2.5 mm. long, dark-brown, shining.

Woodlands and thickets at lower elevations in the western districts, Porto Rico;—Cuba; Hispaniola; Tobago; Trinidad; continental tropical America. Recorded by Krebs as formerly found in St. Thomas.

Family 2. **VITACEAE** Lindl.

GRAPE FAMILY.

Climbing vines or erect shrubs, with copious watery sap, nodose joints, alternate petioled leaves, and small regular greenish perfect or polygamodioecious flowers, in panicles, racemes or cymes. Calyx entire or 4-5-toothed. Petals 4-5, separate or coherent, valvate, caducous. Filaments subulate, inserted at the base of the disk or between its lobes; disk sometimes obsolete or wanting; anthers 2-celled. Ovary 1, generally immersed in the disk, 2-6-celled; ovules 1-2 in each cavity, ascending, anatropous. Fruit a 1-6-celled berry (commonly 2-celled). Seeds erect; testa bony; raphe generally distinct; endosperm cartilaginous; embryo short. About 10 genera and over 500 species, widely distributed.

Petals united into a cup, falling away without separating.

1. *Vitis*.

Petals distinct, spreading.

2. *Cissus*.

1. **VITIS** [Tourn.] L. Sp. Pl. 202. 1753.

Woody vines, rarely shrubby, mostly with tendrils. Leaves simple, often palmately lobed or dentate. Stipules mainly small, caducous. Flowers mostly dioecious, or polygamodioecious, rarely perfect. Petals hypogynous or perigynous, coherent in a cap and deciduous without expanding. Disk annular or cup-shaped. Ovary 2-celled, rarely 3-4-celled; style very short, conic; ovules 2 in each cavity. Berry globose or ovoid, few-seeded, pulpy, edible in most species. [The ancient Latin name.] About 40 species, natives of warm and temperate regions. Type species: *Vitis vinifera* L.

1. ***Vitis tiliacifolia*** H. & B.; R. & S. Syst. 5: 320. 1819.

Vitis caribaea DC. Prodr. 1: 634. 1824.

Vitis vinifera tiliacifolia caribaea Kuntze, Rev. Gen. Pl. 132. 1891.

Vitis vinifera tiliacifolia denticulata Kuntze, Rev. Gen. Pl. 132. 1891.

A vine, sometimes 10 m. or more long, the young branches woolly-tomentose or rarely glabrate, striate. Leaves broadly ovate or orbicular-ovate, thin, 6-17

cm. long, 6.5–15 cm. broad, sinuate with mucronate teeth, sometimes lobed, glabrous or nearly so above at maturity, brownish tomentose beneath, especially when young, cordate or occasionally truncate at the base, the petioles 2–9 cm. long; panicles elongate, 1–2 dm. long, long-peduncled, branched, the branches more or less tomentose; berries globose, 10–12 mm. in diameter, purple; seeds obovoid, grooved on the back.

Woods and forests in wet or moist districts, Porto Rico; St. Thomas; St. Croix (according to Eggers).—Florida; Jamaica; Cuba; Hispaniola; also recorded from St. Barts and Guadeloupe; continental tropical America. PARRA WILD GRAPE. BEJUCO DE AGUA.

Vitis vinifera L., UVA, EUROPEAN GRAPE, European, planted for its fruit in Porto Rico and the Virgin Islands, is a vine several meters long, the young growth smooth or floccose, the lobed leaves rather thin and either glabrous or tomentose beneath, the oval or subglobose berries borne in large clusters.

Several other species and races of *Vitis* have been experimentally grown at the St. Croix Agricultural Experiment Station.

2. *CISSUS* L. Sp. Pl. 117. 1753.

Mostly climbing vines with fleshy foliage. Leaves 3-foliolate or simple, when compound the leaflets commonly separating in drying. Flowers perfect or sometimes polygamous. Petals usually 4, spreading. Disk cup-shaped, adnate to the base of the ovary, mostly 4-lobed. Stamens 4, inserted on the margin of the disk. Ovary 2-celled, adnate to the base of the disk. Ovules 2 in each cavity. Berries rather small, often with scant pulp. [Greek, ivy.] A large genus mostly tropical, known in Porto Rico as CARO. Type species: *Cissus vitifera* L.

Leaves simple.	1. <i>C. sicyoides</i> .
Leaves trifoliolate.	
Leaflets very fleshy, incised-dentate above the middle.	2. <i>C. trifoliata</i>
Leaflets slightly fleshy or not fleshy, dentate or entire, the teeth usually acuminate.	
Leaflets large, usually lanceolate or ovate, 4–10 cm. long, prominently reticulate beneath.	3. <i>C. erosa</i> .
Leaflets smaller, 0.7–4 cm. long, not prominently reticulate beneath.	
Leaflets oblong to oblong-lanceolate.	4. <i>C. intermedia</i> .
Leaflets obovate.	
Leaflets 7–18 mm. long, 5–8 mm. broad, the petioles often less than 5 mm. long.	5. <i>C. obovata</i> .
Leaflets averaging larger, the petioles 1–2.5 cm. long.	6. <i>C. caustica</i> .

1. *Cissus sicyoides* L. Syst. ed. 10, 897. 1759.

Cissus ovata Lam. Tabl. Encycl. 1: 332. 1791.

Vitis sicyoides Morales, Repert. Fis.-Nat. Cuba 1: 203. 1866.

Vitis vitifera repens Kuntze, Rev. Gen. Pl. 138. 1891.

A vine, climbing to a height of 6 m. or more, the foliage and branches pubescent or nearly glabrous. Leaves broadly simple, ovate, broadly ovate or ovate-oblong, 2–15 cm. long, 2–11.5 cm. broad, acute, acuminate or occasionally rounded at the apex, truncate or cordate at the base, serrate, the teeth acute or bristle-tipped, the petioles 1–4 cm. long; tendrils slender, often as long as the leaves; cymes peduncled; berries subglobose or obovoid, black, 7–10 mm. in diameter; seeds solitary, obovoid, 4–6 mm. long.

Woods and thickets at lower and middle elevations, Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida; West Indies; continental tropical America. LAMBRALI. PINAKOOP. PUDDING VINE.

2. *Cissus trifoliata* L. Syst. ed. 10, 897, 1759.

Sicyos trifoliata L. Sp. Pl. 1013. 1753.

Cissus acida L. Sp. Pl. ed. 2. 170. 1762.

A very fleshy vine, up to 5 m. long, glabrous throughout. Leaves 3-foliolate; leaflets ovate to obovate or suborbicular, 1-3.4 cm. long, 0.6-2.5 cm. broad, sharply toothed above the middle, narrowed or cuneate at the base; flowers in compound cymes; berries globose to ovoid, dark purple, apiculate, 5-7 mm. in diameter, the fruiting pedicels recurved; seeds obovoid, 5-6 mm. long. [*Cissus obliqua* of Sessé and Moçino, not of Ruiz and Pavon.]

Coastal thickets, eastern and southern districts, extending little beyond saline influence, Porto Rico; Vieques; Mona; Muertos; Icaros; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Florida; Bahamas; Jamaica; Cuba; Hispaniola; recorded south to Martinique; northern South America.

3. *Cissus erosa* L. C. Rich. Act. Soc. Hist. Nat. 1: 106. 1792.

? *Vitis trifoliata tuberculata* Kuntze, Rev. Gen. Pl. 1: 131. 1891.

A vine, sometimes 6 m. long, with 4-angled stems. Leaves and branches of the young shoots pubescent with long light brown hairs, glabrous or nearly so in age. Leaves 3-foliolate, distinctly petioled; leaflets lanceolate to broadly ovate, occasionally broadest at the middle or above, 4-10 cm. long, 1.7-5.5 cm. broad, acute to acuminate, or rarely obtuse at the apex, acute or somewhat rounded at the base, sessile or short-petioluled, reticulate on both sides, the veins more prominent beneath than above, the midvein and primary veins elevated; cymes usually long-peduncled; flowers red; berry subglobose or globose-ovoid, 6 mm. or more in diameter; seed ovoid, 5-5.2 mm. long, 4 mm. in diameter. [*C. trifoliata* of Bello, not of Linnaeus.]

Moist banks and thickets at lower and middle elevations, Porto Rico:—Hispaniola; St. Vincent; Tobago; Trinidad; continental tropical America.

4. *Cissus intermedia* A. Rich. Ess. Fl. Cub 1: 311. 1845.

A slender, slightly fleshy vine, sometimes 2 m. long or longer, the branches and leaves glabrous, the stems and branches sometimes warty or tuberculate. Leaves slender-petioled, trifoliolate; leaflets oblong to oblong-lanceolate, 1.5-4 cm. long, mostly acute, sparingly serrate, the terminal one equilateral, mostly cuneate-narrowed at the base, the lateral ones oblique; cymes compound, glabrous; pedicels 2-6 mm. long; petals red, reflexed, ovate-lanceolate, acute; berry subglobose, black, the pedicels red.

Near Penuelas and Manati (according to Urban): Bahamas; Cuba; Hispaniola; ? Jamaica.

5. *Cissus obovata* Vahl, Symb. 3: 19. 1794.

A slender vine, the branches glabrous or with scattered hairs mostly at or near the nodes. Leaves trifoliolate, the petioles often less than 5 mm. long; leaflets obovate, 7-18 mm. long, 5-8 mm. broad, sometimes larger, rounded at the apex, acute or cuneate at the base, the margin crenulate or with scattered appressed teeth above the middle; cymes small; pedicels slender; petals triangular-ovate.

Porto Rico, collected by Wydler, according to Planchon; St. Thomas (according to Krebs); St. Croix:—St. Martin.

6. *Cissus caustica* Tussac, Fl. Ant. 1: 116. 1808.

A vine occasionally 15 m. long, the stems clothed with a rusty pubescence, or nearly glabrous. Leaves 3-foliolate; leaflets obovate to orbicular-obovate, shining above, 1.2-4 cm. long, 0.6-2.4 cm. broad, sparingly toothed above the

middle with more or less appressed teeth, rounded or acute at the apex, varying from cuneate to rounded at the base, sessile or short-petioluled: cymes often long-peduncled; flowers red; fruit globose or globose-obovoid, black. [*C. trifoliata* of Krebs, of Eggers and of Millspaugh, not of Linnaeus.]

Forests, Porto Rico; St. Croix; St. Thomas:—Cuba; Hispaniola. Often festooning trees, forming long large masses.

Ampelopsis heterophylla (Thunb.) Sieb. & Zucc., of eastern Asia, grown by Mr. Fairchild at Louisenhøj, St. Thomas, is a slender vine with small, usually glabrous, 3–5-lobed leaves, and stalked cymes of small greenish flowers, the small globose fruits blue, or nearly white. [*Vitis heterophylla* Thunb.]

Order 17. MALVALES.

Herbs, shrubs or trees, with simple, mostly alternate leaves. Flowers regular, usually perfect. Sepals separate, or more or less united, valvate. Petals separate, very rarely wanting. Stamens usually numerous. Ovary superior, compound, the placentae united in its axis. Disk inconspicuous or none.

Stamens twice as many as the sepals, or more.

Stamens in several sets; anthers 2-celled; embryo straight.

Petals none or rudimentary; trees or shrubs.

Fam. 1. ELAEOCARPACEAE.

Petals usually present, glabrous.

Fam. 2. TILIACEAE.

Stamens monadelphous; anthers 1-celled; embryo curved.

Style-branches as many or twice as many as the carpels or ovary-cavities.

Fam. 3. MALVACEAE.

Style entire, or merely lobed.

Fam. 4. BOMBACACEAE.

Stamens as many as the sepals; anthers 2-celled.

Fam. 5. STERCULIACEAE.

Family 1. ELAEOCARPACEAE Lindl.

ELEOCARPUS FAMILY.

Trees or shrubs, with entire, alternate or opposite, stipulate petioled leaves, and usually perfect and apetalous flowers, mostly clustered. Sepals distinct, valvate or imbricated. Stamens many; filaments distinct. Ovary sessile, 2–several-celled; ovules usually many; styles united. Fruit capsular. About 7 genera and 125 species, of tropical distribution.

1. **SLOANEA** L. Sp. Pl. 512. 1753.

Trees, with broad petioled coriaceous leaves, and corymbose or racemose, rarely solitary, perfect or rarely polygamous small flowers. Receptacle thick, dilated. Sepals 3–7 (usually 4), distinct or nearly so. Petals mostly wanting, occasionally 4. Stamens numerous, borne on the receptacle; anthers narrow; basifixed, longitudinally dehiscent. Ovary mostly 4–6-celled; ovules anatropous, style 4-cleft or simple. Capsule woody, 4-valved, mostly 1-celled, smooth or echinate. [Commemorates Hans Sloane, famous Irish physician and botanist.] Forty or fifty species of tropical regions. Type species: *Sloanea dentata* L.

1. **Sloanea Berteriana** Choisy in DC. Prodr. 1: 516. 1824.

A tree, up to 30 m. high, the trunk 6–10 dm. in diameter, the young twigs and leaves finely puberulent, the bark red, slightly fissured, the mature foliage glabrous or nearly so. Stipules linear, 10 mm. long or less, caducous; leaves elliptic or ovate-elliptic, 2.5 dm. long or less, entire, subcoriaceous, strongly

pinnately nerved and reticulate-veined, the apex acute, acuminate or obtuse, the base obtuse or rounded, the stout petioles 2-9 cm. long; inflorescence axillary, few-flowered, subcorymbose, sessile, the pedicels short; sepals 4, yellow without, rose within, about 9 mm. long; petals wanting; filaments about 3 mm. long; anthers about 2 mm. long; capsule ovoid, rounded, 3-4 cm. long, brown, tomentulose; seeds globular, 1-1.5 cm. in diameter.

Forests in wet or moist districts, mostly at middle or higher elevations.—Hispaniola; Guadeloupe. MOTILLO. CACAO ROSETA. CACILLO. The nearly white wood is heavy, strong and durable locally used for construction.

Sloanea dentata L. was recorded by West as planted on St. Croix prior to 1794. It has dentate leaves, its fruit densely covered with long soft processes.

Muntingia Calabura L., West Indian, but not known in the wild state within the geographical limits of this Flora, was listed by Krebs as formerly observed in St. Thomas, where it may have been planted.

Family 2. TILIACEAE Juss.

LINDEN FAMILY.

Trees, shrubs or herbs, with alternate (rarely opposite) simple leaves, mostly small and deciduous stipules, and solitary, cymose or paniculate, usually perfect flowers. Sepals 5, rarely 3 or 4, valvate, deciduous. Petals of the same number, or fewer, or none, glabrous, mostly imbricated in the bud. Stamens mostly 5-10-adelphous; anthers 2-celled. Ovary 1, sessile, 2-10-celled; ovules anatropous; styles united. Fruit 1-10-celled, capsular, drupaceous or baccate. Cotyledons ovate or orbicular; endosperm fleshy, rarely wanting. About 35 genera and 275 species, widely distributed.

Fruit a loculicidal capsule without prickles.
Fruit indehiscent, prickly, subglobose.

1. *Corchorus*.
2. *Triumfetta*.

1. CORCHORUS [Tourn.] L. Sp. Pl. 529. 1753.

Herbs or low shrubs, with alternate serrate leaves, and yellow, solitary or clustered flowers, axillary or opposite the leaves. Sepals and petals 5, rarely 4. Stamens twice as many as the petals or more numerous; filaments filiform, simple, anthers introrse. Ovary superior, 2-5-celled; ovules numerous in each cavity; stigma dilated, undulate. Capsule linear or oblong, many-seeded. [Greek, for some bitter plant.] About 40 species of tropical and subtropical distribution, known in Porto Rico as MALVATÉ. Type species: *Corchorus olitorius* L.

Capsule glabrous or pubescent.

Capsule narrowly oblong, 3-winged, 3-beaked; sepals cucullate.

Capsule linear, not winged; sepals not cucullate.

Capsule acuminate.

Leaves ovate, mostly obtuse.

Leaves lanceolate, acuminate.

Capsule blunt.

Capsule densely woolly.

1. *C. aestuans*.

2. *C. hirtus*.

3. *C. orinocensis*.

4. *C. siliquosus*.

5. *C. hirsutus*.

1. *Corchorus aestuans* L. Syst. ed. 10, 1079. 1759.

Corchorus acutangulus Lam. Encycl. 2: 104. 1786.

Annual, erect or spreading, the branches pilose. Stipules subulate, shorter than the petioles; leaves thin, ovate to suborbicular, 2-7 cm. long, sparingly pilose or glabrate, the apex acute or obtuse, the base rounded or subcordate, the margin serrate with the lower teeth often setaceous, the slender petioles 2 cm.

long or less; flowers solitary or 2 together, nearly sessile; sepals cucullate, about 4 mm. long; petals obovate, about as long as the sepals; capsule narrowly oblong, 3-winged or 3-angled, 1.5–3 cm. long, 3-beaked, glabrous.

Fields and hillsides, vicinity of Coamo, Porto Rico; St. Croix; St. Thomas; Tortola; Virgin Gorda;—Florida; Jamaica; Cuba; Hispaniola; St. Martin to Tobago; Margarita; Bonaire; continental tropical America and Old World tropics.

2. *Corchorus hirtus* L. Sp. Pl. ed. 2, 747. 1762.

Corchorus pilobolus Link, Enum. 2: 72. 1822.

Corchorus hirtus pilobolus Schum. in Mart. Fl. Bras. 12^o: 128. 1886.

Corchorus biflorus Moç. & Sessé, Fl. Mex. ed. 2, 131. 1894.

Herbaceous, perennial, erect or spreading, villous or hirsute, 2–5 dm. high. Stipules as long as the petioles or shorter; leaves ovate, petioled, 5 cm. long or less, dentate, more or less hirsute, the apex obtuse or acutish, the base rounded or subcordate; flowers mostly solitary, short-peduncled; sepals villous, about 6 mm. long; petals spatulate, about as long as the sepals; capsule linear, villous, straight or somewhat curved, acuminate, compressed, 3–5 cm. long.

Fields, roadsides, river-banks and hillsides at lower elevations, Porto Rico; St. Croix; St. Thomas (according to Eggers);—Hispaniola; Antigua; Guadeloupe; Martinique; Barbados; Tobago; South America.

3. *Corchorus orinocensis* H. B. K., Nov. Gen. 5: 337. 1821.

Corchorus hirtus orinocensis Schum. in Mart. Fl. Bras. 12^o: 127. 1886.

Herbaceous, perennial, erect or nearly so, sparingly pilose, 2–4 dm. high. Stipules mostly shorter than the petioles. Leaves thin, lanceolate to ovate-lanceolate, 4–10 cm. long, glabrate, rather sharply dentate, the apex acute or acuminate, the base rounded; flowers mostly solitary; peduncles about one-half as long as the petioles; sepals sparingly pilose, about 5 mm. long; petals a little longer than the sepals; capsule linear, sparingly pubescent, slightly curved, compressed, acuminate, 4–7 cm. long.

Fields, vicinity of Coamo;—Jamaica; Cuba; Antigua to St. Vincent; Curaçao; Texas and Mexico to Venezuela and Bolivia.

4. *Corchorus siliquosus* L. Sp. Pl. 529. 1753.

Shrubby, branched, 3–10 dm. high, glabrous, or the young branches and leaves puberulent or pubescent, the branches often with a line of hairs. Leaves ovate to oblong-lanceolate, 1–5 cm. long, serrate, acute or acuminate at the apex, mostly rounded or obtuse at the base, the short petioles slender; flowers solitary or 2 together, short-peduncled, the pedicels about as long as the peduncles; sepals linear, acute, about 6 mm. long; petals obovate, about 5 mm. long; capsule linear, glabrous, or when young somewhat pubescent, compressed, 5–8 cm. long, about 3 mm. thick, 2-celled, blunt, tipped by 2 short bifid teeth.

Fields, thickets, woodlands, waste and cultivated grounds at lower and middle elevations, Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola;—Florida; West Indies; Texas to northern South America. ESCOBA BLANCO. BROOM-WEED.

5. *Corchorus hirsutus* L. Sp. Pl. 530. 1753.

A shrub, 2 m. high or less, usually erect, but on rocks sometimes nearly prostrate, the young twigs, the leaves and the inflorescence densely pale scurfy-tomentulose. Leaves short-petioled, ovate to oblong-lanceolate, crenate-dentate, 2–6 cm. long, mostly obtuse; flowers in small umbels opposite the leaves, the peduncle about as long as the pedicels; sepals tomentulose, 5–6 mm. long; petals obovate, bright yellow, or pink, about as long as the sepals; capsule oblong.

densely tomentose, obtuse, 4-celled, as long as the curved pedicels or longer, about 6 mm. thick.

Sandy and rocky soil at lower elevations along and near the coasts, locally inland, most abundant in the dry southern districts. Porto Rico; Desecheo; Mona; Muertos; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—West Indies; Mexico to tropical South America. JACK-SWITCH. MALVAVISCO.

Corchorus capsularis L. JUTE, Asiatic, experimentally grown for fiber in Porto Rico, is annual, erect, about 3 m. high, the lanceolate leaves 8–12 cm. long, serrate, with the basal teeth subulate, the globose rugose pods about 1 cm. in diameter.

2. **TRIUMFETTA** L. Sp. Pl. 444. 1753.

Herbs or low shrubs, with alternate broad petioled leaves, and yellow clustered flowers, axillary or opposite the leaves. Sepals 5. Petals 5, pitted at the base, or wanting in some species. Stamens several or numerous, borne on an elongated receptacle, the filaments filiform, the anthers introrse. Ovary borne in the cup-shaped top of the receptacle, 2–5-celled; stigma 2–5-lobed; ovules 2 in each cavity. Capsule subglobose, echinate. [In honor of G. B. Triumfetti, an Italian botanist.] About 70 species, of tropical and warm regions. BURNBUSH. CADILLO. Type species: *Triumfetta Lappula* L.

Petals present.

Fruit tomentose, its prickles glabrous.

Leaves rhomboid-ovate; stamens 15.

Leaves reniform; stamens 8–10.

Fruit glabrous or puberulent, its prickles hispid.

Petals wanting; prickles of the fruit densely hairy.

- *
1. *T. Bartramia*.
2. *T. excisa*.
3. *T. semitriloba*.
4. *T. Lappula*.

1. **Triumfetta Bartramia** L. Syst. ed. 10, 1044. 1759.

Bartramia indica L. Sp. Pl. 389. 1753. Not *T. indica* Lam.

Triumfetta rhomboidea Jacq. Enum. 22. 1760.

Perennial, somewhat woody, erect, branched, 5–10 dm. high, loosely stellate-pubescent. Lower leaves rhomboid-ovate to rhomboid-suborbicular, slender-petioled, dentate, sometimes 3-lobed, 3–8 cm. long, the base rounded or cuneate; upper leaves oblong, short-petioled, much smaller; flowers mostly glomerate in the upper leaf-axils; pedicels very short; sepals 6–7 mm. long; petals oblanceolate, a little shorter than the sepals; stamens 15; ovary 2-celled; fruit globose, 3–4 mm. in diameter, tomentose, the prickles somewhat shorter than the diameter of the body, glabrous, hooked.

In dry soil at lower elevations, Porto Rico; Vieques; St. Croix; Tortola; Virgin Gorda;—Jamaica; Cuba; Hispaniola; Saba to Trinidad; Brazil; Old World tropics.

2. **Triumfetta excisa** Urban, Symb. Ant. 5: 413. 1908.

Perennial, branched, somewhat woody, erect, 3–10 dm. high, the slender branches pilose. Stem-leaves reniform, slender-petioled, 4–7 cm. wide and somewhat wider than long, acutely 3-lobed and irregularly crenate-dentate, the apex acute, the base shallowly cordate, both surfaces loosely pilose; branch-leaves much smaller, ovate; flowers few or solitary in the upper axils, nearly sessile; sepals 6–7 mm. long; petals 4 or 5, yellow, obovate, 5–6 mm. long; stamens 8–10; ovary 2-celled; fruit subglobose, tomentose, about 3 mm. in diameter, the glabrous hooked prickles somewhat shorter than the diameter of the body.

Thickets at lower elevations in moist districts, Porto Rico; St. Croix; Virgin Gorda. Endemic.

3. *Triumfetta semitriloba* Jacq. Enum. 22. 1760.

Triumfetta althaeoides Lam. Encycl. 3: 420. 1791.

Annual, stellate-tomentulose. Stems 1–1.5 m. tall, branched; leaves ovate, rhombic or suborbicular in outline, 3–6 cm. long, serrate, angulate or often 3-lobed, rounded or truncate at the base; petioles as long as the blades or shorter; panicles narrow, elongated; sepals lanceolate, 5–6 mm. long, appendaged below the apex; petals linear to cuneate-spatulate, slightly pubescent at the base; stamens often 15; fruit 3–5 mm. in diameter, copiously prickly, the hispid prickles about as long as the diameter of the glabrous or puberulent body, hooked at the apex.

Banks, fields, hillsides and thickets at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Florida; Bermuda; West Indies; continental tropical America. BUR BARK.

Specimens collected by A. E. Ricksecker at Bassin Yard, St. Croix (No. 136, in part) have the foliage of *T. semitriloba*, but the fruit densely tomentose, suggesting hybridity with *T. Bartramia*.

4. *Triumfetta Lappula* L. Sp. Pl. 444. 1753.

Triumfetta althaeoides Lam. Encycl. 3: 420. 1791.

Perennial, somewhat woody, stellate-tomentulose, 1.5 m. high or less. Lower leaves ovate-orbicular, or broadly ovate, long-petioled, 6–15 cm. broad, serrate, sometimes 3-lobed, the base usually cordate, the apex acute, acuminate or obtuse; upper leaves ovate to oblong, much smaller; panicles narrow; sepals 3–4 mm. long; petals none; stamens about 10; fruit about 4 mm. in diameter, nearly glabrous, the densely hairy prickles about as long as the diameter of the body.

Banks, fields, hillsides and thickets at lower and middle elevations in moist or wet districts, St. Croix; St. Thomas; St. Jan; Tortola:—Bermuda (?); West Indies (except Bahamas); Mexico and Central America. MAHO

Triumfetta procumbens Forst., Australasian, was recorded by Krebs from St. Thomas, apparently in error.

Family 3. MALVACEAE Neck.

MALLOW FAMILY.

Herbs or shrubs, sometimes trees in tropical regions, with alternate leaves. Stipules small, deciduous. Flowers regular, usually perfect, often large. Sepals 5 (rarely 3 or 4), more or less united, usually valvate; calyx often bracted or involucre. Petals 5, hypogynous, convolute. Stamens hypogynous, forming a central column around the pistil, united with the bases of the petals; anthers 1-celled. Ovary several-celled; styles united below, distinct above, and generally projecting beyond the stamen-column, mostly as many as the cavities of the ovary. Fruit capsular rarely indehiscent, several-celled, the carpels falling away entire or else loculicidally dehiscent. Seeds reniform, globose or obovoid; embryo curved; cotyledons large, plicate or conduplicate. About 45 genera and 900 species, widely distributed.

A. Fruit of several or many radiately arranged carpels which mostly separate from each other at maturity.

1. Carpels as many as the stigmas.

Carpels 2—several-seeded.

Carpels leathery or chartaceous.

Carpels 1-celled.

Carpels 2-celled.

Carpels membranous, bladdery.

Carpels only 1-seeded.

Flowers with an involucre.

1. *Abutilon*.

2. *Wissadula*.

3. *Gayoides*.

4. *Malvastrum*.

- Flowers without an involucre.
 Carpels separating at maturity.
 Carpels few or several.
 Carpels many, radiate.
 Carpels permanently united.
2. Carpels half as many as the stigmas.
 Involucre none (except in one species); flowers bracted.
 Involucre present.
 Involucre-bractlets partly united; fruit echinate.
 Involucre-bractlets distinct; fruit not echinate.
 Carpels bearing spines or awns.
 Flowers axillary, solitary.
 Flowers clustered at the ends of peduncles.
 Carpels various, without spines or awns.
 Carpels leathery, merely knobbed; flowers race-
 mose in our species.
 Carpels roughened; flowers paniculate or solitary.
- B. Fruit a loculicidal capsule, or indehiscent
1. Styles distinct.
 Herbs and shrubs; capsule without false partitions.
 Calyx 5-toothed or 5-cleft.
 Calyx spathaceous
 Tree; capsule with false partitions.
2. Styles united.
 Bractlets of the involucre entire, small
 Trees, with indehiscent fruit.
 Calyx persistent.
 Calyx circumscissile, deciduous.
 Low perennial herbs or shrubs with capsular fruit.
 Bractlets of the involucre lacinate, large; capsule loculicidally
 dehiscent.
5. *Sida*.
 6. *Anoda*.
 7. *Bastardia*.
 8. *Malachra*.
 9. *Urena*.
 10. *Paronia*.
 11. *Typhalaea*.
 12. *Malache*.
 13. *Lebretonia*.
 14. *Hibiscus*.
 15. *Abelmoschus*.
 16. *Parili*.
 17. *Thespesia*.
 18. *Montezuma*.
 19. *Cienfuegosta*.
 20. *Gossypium*.

1. **ABUTILON** [Tourn.] Mill. Gard. Dict. Abr. ed. 4. 1754.

Herbs or shrubs, sometimes trees in tropical countries, mostly soft-pubescent, with cordate angular or lobed leaves and axillary flowers. Involucels none. Calyx 5-cleft. Cavities of the ovary 5- ∞ , 3-9-ovuled. Style-branches the same number as the ovary-cavities, stigmatic at the apex; carpels 2-valved, often rostrate, falling away from the axis at maturity. Seeds reniform, the upper ascending, the lower pendulous or horizontal. [Name given by the celebrated Arabian physician, Avicenna (Ibn Sina), died 1037.] About 100 species, natives of warm and tropical regions. Type species: *Sida Abutilon* L.

Carpels 5, each 2-awned; petals yellow.

1. *A. umbellatum*.

Carpels 10-30, not awned.

Petals yellow.

Carpels many, mucronate.

Stem puberulent; flowers 3 cm. wide.

Stem long-pilose; flowers 4 cm. wide.

Carpels about 10, swollen, beaked.

Petals white, fading to rose; carpels swollen.

2. *A. indicum*.

3. *A. hirtum*.

4. *A. abutiloides*.

5. *A. commutatum*.

1. **Abutilon umbellatum** (L.) Sweet, Hort. Brit. 53. 1826.

Sida umbellata L. Syst. ed. 10, 1145. 1759.

Perennial, somewhat woody, erect, usually branched, stellate-tomentose, at least above, 3-8 dm. high. Leaves long-petioled, broadly ovate, the blade 3-10 cm. long, stellate-pubescent or puberulent, 7-9-nerved, crenate or dentate, the apex acute or acuminate, the base cordate or rounded; flowers corymbose or subumbellate, sometimes densely clustered; calyx campanulate, about 6 mm. long in flower; petals yellow, about 8 mm. long; carpels mostly 5, hirsute, about 7 mm. long, 2-aristate. [*Abutilon leiospermum* of Bello, not of Grisebach.]

Plains and hillsides, Porto Rico, mostly in the southwestern districts near the coast; Mona; Culebra; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Jamaica; Cuba; Hispaniola; St. Barts; Grenada; Trinidad; Margarita; Aruba; Mexico and Colombia. MALVAVISCO CIMARRON.

2. **Abutilon indicum** (L.) Sweet, Hort. Brit. 54. 1826.

Sida indica L. Cent. Pl. 2: 26. 1756.

Sida americana L. Sp. Pl. ed. 2, 963. 1763

Sida pubescens Cav. Obs. 1: 33. 1785.

Abutilon subpapyraceum Hochr. Ann. Cons. & Jard. Gen. 6: 23. 1902.

Perennial, shrubby, erect, usually branched, 1.5 m. high or less, finely puberulent. Leaves suborbicular, long-petioled, 3-10 cm. broad, irregularly dentate, softly tomentulose on both sides, the apex acuminate, the base deeply cordate; peduncles axillary, solitary, mostly longer than the petioles; calyx puberulent, about 10 mm. long, its lobes acute; petals about 15 mm. long, yellow; carpels about 20, somewhat inflated, black, shining, 1-1.3 cm. long, minutely 2-beaked. [*Sida asiatica* and *S. graveolens* of Krebs?]

Near Ponce, Porto Rico, along the coast collected by Sintenis in 1886; sandy waste grounds, St. Croix; St. Thomas; Tortola;—Hispaniola; Jamaica; St. Kitts to Trinidad; continental tropical America; Old World tropics.

3. **Abutilon hirtum** (Lam.) Sweet, Hort. Brit. 53. 1826.

Sida hirta Lam. Encycl. 1: 7. 1783.

Abutilon indicum hirtum Griseb. Fl. Br. W. I. 78. 1859.

Abutilon graveolens hirtum Masters, in Hook. Fl. Brit. Ind. 1: 327. 1872.

Perennial, somewhat viscid, shrubby, branched, 6-12 dm. high, the stem and branches densely short-pubescent and long-pilose. Leaves long-petioled, the blade suborbicular, 3-15 cm. broad, acute or short-acuminate at the apex, deeply cordate at the base, irregularly low-dentate, puberulent on both sides, the petioles pilose; peduncles axillary, usually solitary, pilose, as long as the petioles or shorter; calyx densely puberulent, its lobes acute or acuminate; petals yellow, commonly with a brownish red or purple base, 1.5-2 cm. long, about twice as long as the calyx; carpels mostly 20-30, flat, very thin, black, pubescent on the back, mucronulate, about as long as the calyx or a little longer. [*A. indicum* of Bello, not of Sweet; *A. pauciflorum* of Millspaugh, not of St. Hiltaire; *A. graveolens* of Millspaugh; erroneously recorded by Kuntze as *A. asiaticum*.]

Waste and cultivated grounds at lower elevations, Porto Rico; Vieques; St. Croix;—Florida; West Indies; Old World tropics. BUENAS TARDES.

4. **Abutilon abutiloides** (Jacq.) Garcke, Bot. Jahrb. 15: 485. 1893.

Sida abutiloides Jacq. Obs. 1: 17. 1764

Sida lignosa Cav. Diss. 1: 28. 1785.

Abutilon lignosum G. Don, Gen. Hist. 1: 501. 1831.

Shrubby, branched, densely stellate-tomentose, erect, 1-1.5 m. high. Leaves orbicular-ovate, tomentose on both sides, slender-petioled, dentate or denticulate, 10 cm. long or less, the apex acute or acuminate, the base cordate; flowers axillary, solitary on peduncles mostly longer than the petioles; calyx about 10 mm. long, tomentose, its lobes broadly ovate, acute or acuminate; petals yellow, a little longer than the calyx; carpels about 10, swollen, beaked, about 15 mm. long.

Roadsides and waste grounds, eastern part of St. Croix (according to Eggers), St. Thomas (according to Krebs);—Bahamas; Jamaica; Cuba; Hispaniola; Mexico. Not seen by us from within the area of this investigation.

5. **Abutilon commutatum** Schumann in Mart. Fl. Bras. 13: 405. 1894.

Abutilon leucophaeum Hochr. Ann. Cons. & Jard. Gen. 6: 15. 1902.

A shrub, 1 m. high or higher, densely velvety-tomentose all over. Leaves long-petioled, the blade broadly ovate, 5-12 cm. long, irregularly crenulate, the apex acute, the base deeply cordate; flowers axillary, solitary or short-paniculate;

peduncles short, sometimes as long as the upper petioles; calyx about 13 mm. long, deeply cleft, the lobes ovate, acute; petals white, fading rose, somewhat longer than the calyx; carpels 12-14, swollen, black, apiculate. [*A. pedunculare* of Bello, not of Kunth.]

Thickets and hillsides, vicinity of Guanica. Endemic. TERCIOPELO.

Abutilon permolle (Willd.) Sweet, of Florida, the Bahamas, Cuba and Jamaica, listed by Krebs from St. Thomas, probably in error, is not otherwise recorded from within the range of this Flora [*Sida permollis* Willd.].

2. WISSADULA Medic. Malv. 24. 1787.

Perennial herbs, somewhat woody, with petioled cordate, mostly entire leaves, and small, yellow or white, perfect, 5-parted, exinvolucrate flowers in terminal panicles, or solitary in the axils. Calyx deeply lobed. Ovary 5-celled; ovules mostly 3 in each cavity; style-branches 5. Carpels 5, each 2-celled, impressed laterally, apiculate or aristate. Seeds mostly 3 in each carpel, the lower one often villous. [East Indian name.] About 20 species, of tropical distribution, mostly American. Type species:—*Wissadula zeylanica* Medic.

Leaves ovate or ovate-lanceolate, truncate or subcordate, gradually acuminate; petals white.
Leaves orbicular-ovate, deeply cordate, mostly long-acuminate; petals yellow.

1. *W. periplocifolia*.
2. *W. amplissima*.

1. *Wissadula periplocifolia* (L.) Presl, Rel. Haenk. 2: 117. 1836.

Sida periplocifolia L. Sp. Pl. 684. 1753.

Abutilon periplocifolium Sweet, Hort. Brit. 53. 1826.

Perennial, somewhat woody, stellate-pubescent, branched, 5-10 dm. high. Leaves lanceolate to ovate-lanceolate, entire, cordate, gradually long-acuminate, the lower ones slender-petioled, 5-15 cm. long, the upper short-petioled, much smaller; flowers solitary in the axils and in a terminal panicle sometimes 2 dm. long; pedicels filiform, 2 cm. long or less; calyx about 4 mm. long; petals white, about twice as long as the calyx; carpels black, apiculate, 6-8 mm. long.

Plains and hillsides at lower elevations, southern and western districts of Porto Rico; St. Croix:—Cuba; Trinidad; Margarita; northern South America.

2. *Wissadula amplissima* (L.) R. E. Fries, Svenska Vet. Akad. Handl. 43: 48. 1908.

Sida amplissima L. Sp. Pl. 685. 1753.

Sida hernandioides L'Her. Stirp. Nov. 2: 121. 1789.

Abutilon hernandioides Sweet, Hort. Brit. 53. 1826.

Wissadula rostrata Planch. in Hook. Niger Fl. 229. 1849.

Wissadula periplocifolia hernandioides Griseb. Cat. Pl. Cub. 25. 1866.

Wissadula hernandioides Garcke, Zeltz. Naturw. 63. 122. 1890.

Abutilon amplissimum Kuntze, Rev. Gen. Pl. 3: 17. 1898.

Perennial, woody, stellate-tomentulose, erect, branched, 1.5 m. high or less. Leaves broadly ovate, thin, entire, cordate, acute or acuminate, the lower ones slender-petioled, 5-15 cm. long, the upper much smaller, nearly sessile; flowers solitary in the upper axils and forming a terminal panicle; pedicels slender or short, often with large simple or stellate hairs; calyx about 3 mm. long; petals yellow, 5-6 mm. long; carpels 7-8 mm. long, short-beaked, puberulent, brownish.

Plains and hillsides, Porto Rico, at lower elevations, southern and western districts; Culebra; Vieques; St. Croix; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; continental tropical America. We have been unable to distinguish *W. hernandioides* from *W. amplissima* in Porto Rico. PICHANA.

3. **GAYOIDES** Small, Fl. SE. U. S. 764. 1903.

A slender, perennial, finely velvety and often also villous herb, with petioled ovate cordate leaves and solitary axillary filiform-peduncled whitish flowers. Involucre none. Calyx deeply 5-cleft. Petals 5, distinct. Carpels numerous, 1-celled, membranous and inflated in fruit, the apex rounded; styles slender, stigmas terminal: ovules 2-6 in each carpel. Seeds glabrous. [Similar to the genus *Gaya*.] A monotypic genus.

1. **Gayoides crispum** (L.) Small, Fl. SE. U. S. 764. 1903.

Sida crisp L. Sp. Pl. 685. 1753.

Abutilon crispum Medic. Malv. 29. 1787.

Usually much branched, the branches diffuse or ascending, 3-10 dm. long. Leaves thin, broadly ovate, 2-7 cm. long, acute or acuminate at the apex, deeply cordate at the base, crenate or crenulate, the petioles equalling the blades, or shorter, sometimes very short; peduncles as long as the leaves, or shorter, jointed below the flower; calyx velvety and often villous, its lobes ovate or ovate-lanceolate, acute, 4-6 mm. long; petals pale yellow or whitish, obovate, about twice as long as the calyx; fruiting head of carpels 12-20 mm. thick, the inflated carpels somewhat pubescent.

In dry soil near the southwestern coast, and in sand-dunes at Santurce, Porto Rico; Mona; St. Thomas:—Florida; West Indies, south to Grenada; Margarita; Texas and New Mexico; south into South America; tropical Asia.

4. **MALVASTRUM** A. Gray, Mem. Am. Acad. II. 4: 21. 1849.

Herbs, with entire cordate or divided leaves, and solitary or clustered, short-pedicelled perfect flowers. Calyx 5-cleft. Bractlets of the involucrels small, 1-3 or none. Cavities of the ovary 1-ovuled. Style-branches of the same number, stigmatic at the summit only, forming capitate stigmas; carpels indehiscent or imperfectly 2-valved, falling away from the axis at maturity, their apices pointed or beaked. Seed ascending. [Greek, star-mallow.] About 75 species, natives of America and S. Africa. Known as MALVAVISCO and FALSE MALLOW. Type species: *Malvastrum coccineum* (Pursh) A. Gray.

Carpels aristate; flowers mostly solitary in the axils.

Carpels not aristate; flowers in terminal heads or spikes, or also axillary.

Flowers mostly in short terminal heads or spikes 1-2 cm. long.

Flowers in dense terminal spikes 5-12 cm. long.

1. *M. coromandelianum*.

2. *M. corchorifolium*.

3. *M. spicatum*.

1. **Malvastrum coromandelianum** (L.) Garcke, Bonplandia 5: 297. 1857.

Malva coromandeliana L. Sp. Pl. 687. 1753.

Malva tricuspidata Ait. Hort. Kew. ed. 2, 4: 210. 1812.

Malvastrum tricuspidatum A. Gray, Pl. Wright. 1: 16. 1852.

Perennial, strigose-pubescent, branched, 3-10 dm. high. Leaves ovate to oblong-ovate, slender-petioled, 2-8 cm. long, acute, sharply serrate, the hairs of the upper surfaces mostly simple; flowers mostly solitary in the axils, on peduncles shorter than the petioles; involucrels of 3 small bractlets; calyx-lobes triangular, acute, longer than its tube; petals pale yellow, somewhat longer than the calyx, obliquely truncate; carpels 8-12, hirsute on top, with an awn near the inflexed apex and 2 beaks on the back. [*Malva americana* of Krebs and of Bello, not of Linnaeus.]

Banks, fields, roadsides and cultivated grounds, Porto Rico; Desecheo; Muertos; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—southern United States; Bermuda; West Indies; continental tropical America and Old World tropics. SOAP BUSH.

2. *Malvastrum corchorifolium* (Desv.) Britton; Small, Fl. Miami 119. 1913.*Malva corchorifolia* Desv. in Lam. Encycl. 3: 755. 1791.*Malvastrum Rugelii* S. Wats. Proc. Am. Acad. 17: 367. 1882.

Similar to the preceding species, about as pubescent and the leaves much alike in both, the hairs of the upper surfaces mostly forked. Flowers mostly in terminal heads 1-2 cm. long, or some of them solitary in the axils; calyx-lobes triangular-ovate, acuminate; petals orange or yellow, oblique or obcordate, longer than the calyx; carpels about 10 or fewer, hispidulous, beakless, or sometimes with a blunt protuberance.

Plains and hillsides at lower elevations in the dry southern districts of Porto Rico; Desecheo; Vieques; St. Croix; Virgin Gorda:—Florida; Bahamas; Cuba; Hispaniola; Jamaica.

3. *Malvastrum spicatum* (L.) A. Gray, Mem. Am. Acad. 4: 22. 1849.*Malva spicata* L. Syst. ed. 10, 1146. 1759.

Perennial, usually densely stellate-pubescent, erect stout, branched, 0.5-2 m. high. Leaves broadly ovate, serrate, stellate-pubescent on both sides, the apex acute or acuminate, the base subtruncate or obtuse, the lower ones long-petioled, 7 cm. long or less, the upper smaller; flowers in dense terminal spikes 5-12 cm. long, 1.5-2.5 cm. thick, with sometimes a few in the upper axils; bractlets 5-7 mm. long; calyx about 5 mm. long; petals yellow, about 7 mm. long; carpels nearly 2 mm. long, beaked, not aristate.

Fields, waste and cultivated grounds at lower elevations. Porto Rico; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda:—West Indies (except Bahamas); continental tropical America and Old World tropics.

Malvastrum capitatum (Cav.) Griseb., recorded by Krebs from St. Thomas. is a species of southern South America [*Malva capitata* Cav.].

5. *SIDA* L. Sp. Pl. 683. 1753.

Herbs, rarely shrubs or trees, with serrate crenate or lobed leaves, and perfect flowers. Bractlets of the involucre none. Calyx 5-toothed or 5-cleft. Cavities of the ovary 1-ovuled; style-branches of the same number as the cavities, stigmatic at the summit. Carpels indehiscent, or at length 2-valved at the apex. Seed pendulous. [Greek, used by Theophrastus.] About 75 species; natives of the warmer parts of America, Asia, Africa and Australasia. Known as ESCOBA and ESCOBITA. Type species: *Sida alnifolia* L.

A. Herbaceous plants.

1. Flowers adnate to the petioles of foliaceous bracts, clustered at the ends of the branches.

1. *S. ciliaris*.

2. Flowers not adnate to petioles, solitary or clustered.

*Calyx distinctly angular.

†Leaves narrowed or rounded or subcordate at the base. Carpels mostly 5.

Peduncles as long as the calyx or longer.

Velvety-pubescent; carpels long-beaked.

2. *S. erecta*.

Sparingly pubescent; carpels short-beaked.

3. *S. spinosa*.

Flowers subsessile.

Leaves lanceolate to oblong-lanceolate, mostly

acuminate.

Leaves ovate, obtuse or acute.

4. *S. glomerata*.

Carpels mostly 7-12.

5. *S. jamaicensis*.

Flowers short-peduncled.

Peduncles about as long as the leaves.

6. *S. carpinifolia*.

††Leaves cordate at the base.

7. *S. rhombifolia*.

Stems prostrate or nearly so.

Leaves densely puberulent, obtuse.

8. *S. procumbens*.

Leaves glabrous, or with a few scattered hairs, acute.

9. *S. humilis*.

Stems erect.

Leaves softly and densely velvety or tomentose

on both sides.

Carpels 10-12; pubescence velvety.

10. *S. cordifolia*.

- Carpels 5; pubescence tomentose.
 Leaves glabrous, glandular or pilose.
 Peduncles solitary or 2-3 together in the axils,
 some of them filiform and longer than the
 calyx.
 Calyx-teeth ovate-lanceolate, as long as the
 tube.
 Calyx-teeth broadly ovate, shorter than
 the tube.
 Flowers glomerate, subsessile.
 **Calyx-tube terete.
 Leaves ovate to lanceolate, short-petioled.
 Leaves broadly ovate, long-petioled.
- B. A tree up to 8 m. high; leaves large, ovate, cordate.
11. *S. aggregata*.
 12. *S. glabra*.
 13. *S. glutinosa*.
 14. *S. urens*.
 15. *S. acuminata*.
 16. *S. pyramidata*.
 17. *S. Eggersii*.

1. *Sida ciliaris* L. Syst. ed. 10, 1145. 1759.

Perennial, strigose-pubescent, diffusely branched at the base from a deep woody root, the slender branches prostrate or ascending, 1-3 dm. long. Leaves oblong or elliptic, 0.7-3.5 cm. long, obtuse or emarginate at the apex, mostly obtuse at the base, serrate, mostly above the middle, slender-petioled, usually glabrous above and stellate-pubescent beneath; flowers clustered at the ends of the branches, their short peduncles adnate to the petioles of the foliaceous bracts; stipules linear or linear-spatulate, long-ciliate, about as long as the petioles; calyx hirsute, its triangular acute lobes about as long as the nearly terete tube; petals red, yellow or purplish, blotched at the base, 6-12 mm. long; carpels 5-8, wrinkled or tubercled, 2 beaked.

Porto Rico (according to Stahl, but not observed by recent botanists); in dry soil. St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—Florida; Bahamas; Jamaica; Hispaniola; St. Martin; Bequia; Margarita; Curaçao; Aruba; tropical South America.

2. *Sida erecta* Macf. Fl. Jam. 1: 86. 1837.

Sida angustifolia Moritziana Schum. in Mart. Fl. Bras. 12: 336. 1891.

Annual, erect, branched or sometimes simple, 4 dm. high or less, velvety pubescent. Leaves oblong or linear-oblong, petioled, 1-4 cm. long, velvety on both sides, acutish, serrulate, the base narrowed or obtuse; flowers axillary, or few together in a terminal cluster; peduncles, or some of them as long as the calyx or longer, mostly longer than the petioles; calyx angled, velvety, about 6 mm. long, its teeth triangular, acute; corolla white with a yellow eye, about 1 cm. broad; carpels long-beaked. [*S. angustissima* of R. E. Fries, not of St. Hilaire.]

Dry soil in the southern and southwestern districts of Porto Rico, near the coast; Culebrita; Muertos; St. Croix; Tortola; Virgin Gorda;—Jamaica; Colombia.

3. *Sida spinosa* L. Sp. Pl. 683. 1753.

Sida angustifolia Lam. Encycl. 1: 4. 1783.

Sida spinosa angustifolia Griseb. Fl. Br. W. 1. 74. 1859.

Annual, finely pubescent, 3-6 dm. high. Leaves ovate to oblong-lanceolate, 2-5 cm. long, petioled, truncate or subcordate at the base, crenate-dentate; flowers axillary, short-peduncled, yellow; peduncles shorter than the petioles; calyx-teeth triangular, acute; carpels 5, dchiscent at the apex into 2 beaks; stipules linear; petioles of the larger leaves with a small spinose-like tubercle at the base. [? *S. spinosa polycarpa* of Eggers; *S. retusa* of Millspaugh.]

Dry soil at lower elevations near the southern and western coasts of Porto Rico; Mona; St. Croix; St. Thomas; St. Jan; Virgin Gorda;—eastern United States, West Indies, south to Barbados, Grenada and Aruba; continental tropical America and Old World tropics.

4. *Sida glomerata* Cav. Diss. 1: 18. 1785.

Sida Berteriana Balb.; DC. Prodr. 1: 460. 1824.

Somewhat woody, erect, branched, pilose, at least above, 3–15 dm. high. Leaves thin, oblong-lanceolate, nearly sessile, serrate, 2–8 cm. long, the apex acute or acuminate, the base narrowed; flowers several together in nearly sessile, axillary clusters; calyx campanulate, 5-angled, 10-nerved, about 7 mm. long, pilose, its triangular lobes acuminate; petals white or whitish, a little longer than the calyx; carpels 5, about 2 mm. long, reticulated, obtuse. [*S. jamaicensis* of Bello, not of Linnaeus.]

Fields, banks and hillsides at lower elevations, Porto Rico; Vieques; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Jamaica; Cuba; Hispaniola; Martinique to Trinidad; continental tropical America.

5. *Sida jamaicensis* L. Syst. ed. 10, 1145. 1759.

Sida tristis Schl. Linnaea 3: 271. 1828.

Perennial, erect, decumbent, prostrate or ascending, branched, velvety-stellate, 3–6 dm. high. Leaves ovate or ovate-oblong, short-petioled, crenate or crenulate, velvety, 2–5 cm. long, the apex acute or obtuse, the base mostly obtuse, more or less oblique; flowers nearly sessile in the axils, solitary or few together; calyx 6–7 mm. long, turbinate, 5-angled, its triangular lobes acuminate; petals white, or light yellow, broad, about as long as the calyx; carpels 5, about 2 mm. long, 2-aristulate, reticulated or somewhat tuberculate.

Hillsides, St. Croix; St. Thomas; St. Jan; Virgin Gorda:—Jamaica; Cuba; Hispaniola; St. Barts; Guadeloupe; Mexico to Colombia; not yet detected on Porto Rico or any of its islands.

6. *Sida carpinifolia* L.f. Suppl. 307. 1781.

Sida repanda Roth, Nov. Pl. Sp. 328. 1821.

Sida acuta carpinifolia Schum. in Mart. Fl. Bras. 12: 326. 1891.

Sida antillensis Urban, Symb. Ant. 5: 418. 1908.

Puberulent or glabrous. Stems erect, 3–9 dm. tall, branching; leaves lanceolate, oblong-ovate or ovate, 2–10 cm. long, acute or acuminate, irregularly serrate, obtuse or subcordate at the base, the petioles 3–7 mm. long; stipules conspicuous, narrowly linear to lanceolate, surpassing the petioles; peduncles mostly shorter than the pedicels, 1–7 mm. long; calyx 5–10-ribbed, its lobes triangular, slightly acuminate, about as long as the tube; petals yellow to white, 6–12 mm. long; carpels reticulate-wrinkled, 2-beaked. [*S. carpinifolia acuta* and *S. carpinifolia antillana* of Millspaugh; (?) *S. carpinifolia brevicuspudata* of Eggers; referred to *S. acuta* Burm. by Urban.]

Banks, fields and hillsides, mostly at lower elevations, Porto Rico; Vieques; Muertos; Icacos; St. Thomas; St. Jan; St. Croix:—southeastern United States; Bermuda; West Indies; continental tropical America. WIRE-WEED.

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

Annual, 3–9 dm. high, branched, puberulent or glabrate, usually erect. Leaves rhombic, elliptic-obovate or oblanceolate, short-petioled, 2–9 cm. long, acute or obtuse, serrate, except near the usually narrowed or subcuneate base, somewhat pubescent beneath; flowers solitary in the axils, slender-peduncled, the peduncles mostly about as long as the leaves or longer; calyx angled, about 6 mm. long, its lobes triangular, acuminate; petals yellow, 6–8 mm. long; carpels 10 or 12, subulate-beaked, 3–4 mm. long.

Fields, banks and hillsides, at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan:—southeastern United States; Bermuda; West Indies (except Bahamas); continental tropical America and Old World tropics.

8. *Sida procumbens* Sw. Prodr. 101. 1788.

Sida pilosa Cav. Diss. 1: 9. 1785. Not Retz. 1779.

Sida supina L'Her. Stirp. Nov. 109. 1789.

Branched at the base, the branches slender, prostrate or nearly so, 1–6 dm. long, densely puberulent, glabrate or pilose. Leaves ovate or ovate-orbicular, 1–2.5 cm. long, slender-petioled, crenate, obtuse at the apex, cordate at the base, densely puberulent on both sides; peduncles axillary, solitary, about as long as the leaves or shorter, or longer, filiform, sometimes pilose; calyx about 4 mm. long, puberulent or pilose, its 5 ovate acuminate lobes somewhat shorter than the angled tube; petals pale yellow or white with yellow base, 4–6 mm. long; carpels mostly 5, reticulate, 2-beaked, about 2 mm. long. [*S. ovata* Cav., not Forsk.]

Fields, banks and hillsides, Porto Rico, at low elevations in dry parts of the southern and southwestern districts; Mona; Desecheo; Vieques; St. Croix; Anogada.—Florida; Bahamas; Jamaica; Cuba; Hispaniola; St. Martin; St. Eustatius; Saba; Curaçao; Aruba; continental tropical America.

9. *Sida humilis* Cav. Diss. 5: 277. 1788.

Perennial; stem prostrate or trailing, branched, 2–5 dm. long, slender, glabrous or sometimes strigose. Leaves ovate or orbicular-ovate, rather thin, sparingly stellate-pubescent or glabrous, cordate, acute or acuminate, crenate-dentate, 2–4 cm. long, the petioles very slender; flowers axillary, yellow, filiform-peduncled, about 1 cm. broad; calyx angled, about 5 mm. long, ciliate or sparingly pubescent, its teeth ovate-lanceolate, acute; carpels short-beaked. [*S. procumbens* Bello, not Swartz; *S. supina* of Stahl and of Millspaugh, not L'Heritier; *Sida supina glabra* of Eggers and of Millspaugh; *S. hederacfolia* of Krebs; specimens from Maricao were, apparently, erroneously referred by Urban to *S. hederacfolia* Cav., but the application of the name *humilis* to our plant is not certainly determined.]

Sandy banks at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Hispaniola; Saba; Grenada.

10. *Sida cordifolia* L. Sp. Pl. 684. 1753.

Sida althaeifolia Sw. Prodr. 101. 1788.

Sida conferta Link, Enum. 2: 207. 1822.

Sida portoricensis Spreng. Syst. 3: 114. 1826.

Densely stellate-velvety all over, perennial, somewhat woody; stems erect, rather stout, 6–15 dm. high. Leaves ovate to ovate-orbicular, irregularly dentate, acute or obtuse, the lower long-petioled, cordate, 8 cm. long or less, the upper smaller, short-petioled, the base rounded or subcordate; flowers terminal and axillary, corymbose or subglomerate; calyx tomentose, 5-angled, about 6 mm. long, the lobes acute; petals yellow, nearly twice as long as the calyx; carpels 7–12, about 4 mm. long, aristate, their sides reticulated. [*S. cordifolia althaeifolia* of Millspaugh.]

Dry soil on plains and hillsides, Porto Rico, at lower elevations, mostly near the coasts; St. Croix; St. Thomas; St. Jan; Virgin Gorda.—Florida; Jamaica; Cuba; Hispaniola; St. Martin to Trinidad; continental tropical America; Old World tropics.

11. *Sida aggregata* Presl, Rel. Haenk. 2: 106. 1836.

Sida savannarum Schum. in Mart. Fl. Bras. 12^o: 308. 1891.

Erect, perennial, more or less branched, stellate-tomentose all over, 6–15 dm. high. Lower leaves long-petioled, broadly ovate, irregularly serrulate or crenate, 3–8 cm. long, the base cordate, the apex acute or acuminate; uppermost leaves much smaller than the lower; flowers glomerate or subpaniculate in a terminal panicle or also in the upper axils, sessile or very nearly so; calyx turbinate, 5-angled, densely tomentose, 7–8 mm. long, its lobes triangular-ovate, acute;

petals yellow or saffron, somewhat longer than the calyx; carpels 5, about 2 mm. long, obtuse, reticulated.

Roadsides, St. Croix:—Jamaica; northern South America.

12. ***Sida glabra*** Mill. Gard. Dict. ed. 8. 1768.

Sida ulmifolia Cav. Diss. 1: 15. 1785.

Sida arguta Sw. Prodr. 101. 1788.

Perennial, erect, or with decumbent branches, slender, glabrate, or sparingly pubescent with mostly simple hairs, 2–7 dm. high. Leaves slender-petioled or the upper ones nearly sessile, ovate, serrate, thin, 2–7 cm. long, the base cordate, the apex acuminate; flowers solitary or 2 or 3 together in the axils, slender-peduncled; calyx 5-angled, 5–6 mm. long, its teeth ovate-lanceolate, about as long as the tube; petals yellow, about as long as the calyx; carpels 5, glabrous, 2-awned.

Plains, hillsides and thickets in the southern and southwestern districts of Porto Rico, at lower elevations; Mona; Desecheo; Culebra; Vieques; St. Croix; St. Thomas; Tortola; Virgin Gorda:—Jamaica; Cuba; Hispaniola; St. Martin to Martinique; Central America to Venezuela.

13. ***Sida glutinosa*** Comm.; Cav. Diss. 1: 16. 1785.

Sida nervosa DC. Prodr. 1: 465. 1825.

Erect, 5–10 dm. high, branched, the stem and branches densely tomentulose, somewhat glutinous, sometimes also with long spreading hairs. Leaves ovate to lanceolate, 8 cm. long or less, acuminate at the apex, cordate at the base, crenulate, the lower long-petioled, the upper usually much smaller than the upper and shorter-petioled; flowers 1–several in the axils or in terminal panicles; pedicels filiform, mostly much longer than the calyx, pubescent; calyx angled, 3–5 mm. long, its broadly ovate, sharply acute teeth shorter than the tube; petals yellow, about twice as long as the calyx; carpels 5, pubescent above, 2-aristate. [*S. nervosa viscosa* of Eggers.]

In dry soil, southern and western districts at lower elevations, Porto Rico; St. Croix; St. Thomas; St. Jan:—Bahamas; Jamaica; Cuba; Hispaniola; Antigua, Guadeloupe; Trinidad; continental tropical America.

14. ***Sida urens*** L. Syst. ed. 10, 1145. 1759.

Harshly hirsute, erect, ascending, or prostrate, weak, branched or sometimes simple, 3–15 dm. high. Leaves ovate or ovate-lanceolate, 2.5–8 cm. long, acute or acuminate at the apex, cordate at the base, slender-petioled, serrate, loosely stellate-pubescent; flowers subsessile in axillary and terminal, usually dense clusters, or some of them axillary, solitary and short-pedicelled; calyx hirsute, 5-cleft, angular, 6–7 mm. long, its triangular-ovate, acute or acuminate teeth about as long as the tube; petals yellow, reddish at base, or pink, or white; carpels 5, glabrous, 2-denticulate. [*S. ulmifolia* of Stahl, not of Cavanilles.]

Banks, thickets and hillsides, at low and middle elevations in moist districts of Porto Rico; Vieques:—Bahamas; Jamaica; Cuba; Hispaniola; Antigua to Trinidad; continental tropical America; tropical Africa.

15. ***Sida acuminata*** DC. Prodr. 1: 462. 1825.

Densely stellate-pubescent, somewhat woody, 5–8 dm. high, branched or sometimes simple. Leaves ovate to ovate-lanceolate, rather short-petioled, 2–7 cm. long, acute, obtuse, or acuminate at the apex, rounded or subcordate at the base, low crenate-serrate; flowers few or solitary in the axils and often in small terminal clusters, nearly sessile or filiform-peduncled, the peduncles sometimes 2–3 cm. long; calyx 5–6 mm. long, terete, its 5, broadly ovate, acute teeth somewhat shorter than the tube; petals yellow, 4–5 mm. long; carpels 5–8, stellate-

pubescent, scarcely beaked. [*S. acuminata sessilis* E. G. Baker; *S. acuminata Bracci* E. G. Baker; *S. acuminata macrophylla* and *microphylla* Schl.]

Hillsides and plains, southern and western districts of Porto Rico, at lower elevations; Culebra; Mona; Desecheo; Vieques; St. Croix; St. Thomas; Tortola; Virgin Gorda:—Bahamas; Cuba; Hispaniola; St. Martin; St. Barts, St. Kitts, Antigua; Montserrat; northern South America.

16. *Sida pyramidata* Desportes; Cav. Diss. 1: 11. 1785.

Sida dumosa Sw. Prodr. 101. 1788.

Sida leiophylla Spreng. Syst. 3: 121. 1826.

Perennial, somewhat woody, branched, erect or nearly so, 6–20 dm. high, the slender branches puberulent. Leaves slender-petioled, broadly ovate, glabrous or puberulent, crenulate-dentate, 3–10 cm. long, the base cordate, the apex acute or acuminate; flowers in terminal and sometimes axillary narrow panicles often longer than the leaves; pedicels short; calyx subhemispheric, not angled, pubescent, about 4 mm. long, its triangular lobes sharply acute; petals yellow or reddish, a little longer than the calyx; carpels 5–8, glabrous, tuberculate, 2-cuspidate.

Thickets and arroyos in the dry southern districts, Porto Rico:—Jamaica; Cuba; Hispaniola; Martinique; continental tropical America.

17. *Sida Eggersii* E. G. Baker, Journ. Bot. 30: 139. 1892.

A tree, up to 8 m. high, with a trunk 1.5 dm. in diameter or more, the short, rather stout twigs densely yellowish-furfuraceous when young, becoming glabrous. Leaves long-petioled, broadly ovate, rather thick, crenate-dentate, finely velvety on both sides, 5–15 cm. long, 7–9-nerved, the apex acute or obtuse, the base cordate; flowers in rather dense axillary panicles shorter than the leaves; pedicels very short; calyx broadly campanulate, velvety, not angled, 12–14 mm. long, its triangular-ovate lobes acute; petals yellow, somewhat longer than the calyx; carpels 5 or 6, pubescent, about 3 mm. long, shortly 2-cuspidate.

In a dry valley, Culebra; hillsides, Tortola; perhaps also on St. Thomas (see Eggers, Suppl. 14). Endemic. One of the most interesting species of our Flora. This may be the plant recorded by Krebs from St. Thomas as *Sida arborea*.

Sida purpurea Bello, Anal. Soc. Esp. Hist. Nat. 10: 239. 1881.

This is described as a low shrub, with small ovate serrate leaves, and small subsolitary rose-colored flowers, the capsule 5-celled, recorded by Bello as found at Aguadilla. It is known to us only from the description and may not belong to this genus.

Sida Sessei Lag., Mexican, recorded by Krebs from St. Thomas, must be an error in identification.

6. *ANODA* Cav. Diss. 1: 39. 1785.

Herbs, mostly annual, glabrous, or pubescent with simple hairs, the leaves various, usually lobed, the rather large, perfect, mostly purple, lilac or violet, exinvolucrate flowers solitary and peduncled in the axils. Calyx 5-lobed, accrescent. Petals 5, oblique. Styles 5. Stamen-tube elongated. Carpels many, radiate, 1-seeded, the seed pendulous. [Greek, without nodes.] Perhaps 15 species or more, of tropical and subtropical distribution. Type species: *Anoda hastata* Cav.

1. *Anoda acerifolia* (Zucc.) DC. Prodr. 1: 450. 1825.

Sida acerifolia Zucc. in Roemer, Coll. 148. 1809.

Glabrous, or sparingly hirsute above, branched, erect, diffuse or prostrate, 3–8 dm. long. Leaves slender-petioled, various, ovate-deltoid, entire, dentate or palmately lobed, 2–7 cm. long, the apex acute or acuminate, the base truncate or cordate; peduncles slender, mostly as long as the leaves or longer; calyx 5-lobed to about the middle, 1.5–2.5 cm. broad in fruit, the lobes ovate, acute; petals blue or lilac, obovate, 1–1.5 cm. long; carpels 9–15, setose, tomentose, short-beaked, about 4 mm. long. [*A. hastata* of authors, not of Cavanilles.]

Banks, fields and cultivated grounds, Porto Rico, ascending to higher elevations: Jamaica; Cuba; Hispaniola; Tobago; continental tropical America. VIOLETA. ANODA.

7. *BASTARDIA* H. B. K. Nov. Gen. 5: 254. 1821.

Velvety-pubescent or tomentose shrubs or perennial herbs, with petioled cordate leaves, and small yellow peduncled flowers, solitary or few in the axils. Involucre none. Calyx 5-toothed or 5-cleft. Petals 5. Stamen-column divided into several or many filaments at the apex. Ovary 5-celled; ovules 1 in each cavity, pendulous; style-branches 5; stigmas capitate. Capsule depressed-globose, 5-grooved, 3–5-valved. [Commemorates the French botanist T. Bastard.] Six known species, of tropical America. Type species: *Bastardia parvifolia* H. B. K.

Pedicels usually longer than the petioles, often longer than the leaves; carpels beakless.

Pedicels short, not longer than the calyx; carpels beaked.

1. *B. viscosa*.
2. *B. bivalvis*.

1. *Bastardia viscosa* (L.) H. B. K. Nov. Gen. 5: 256. 1822.

Sida viscosa L. Syst. ed. 10, 1145. 1759.

Sida foetida Cav. Diss. 6: 149. 1788.

Sida retrofracta DC. Prodr. 1: 457. 1824.

Finely velvety-pubescent and viscid, sometimes also pilose, erect, branched, 3–7 dm. high. Leaves ovate, 1–6 cm. long, acute or acuminate at the apex, cordate at the base, irregularly denticulate, the slender petioles as long as the blades or shorter; pedicels nearly filiform, longer than the petioles, often longer than the leaves, rarely not longer than the calyx; calyx about 4 mm. long, its 5, ovate-lanceolate, acuminate teeth about as long as the tube; petals yellow, 4–5 mm. long; capsule about as long as the calyx, its carpel-valves beakless. [*Abutilon leiospermum* of Stahl, not of Grisebach.]

Plains and hillsides, at low elevations in the southern and southwestern districts, Porto Rico; Muertos; Mona; St. Croix; St. Thomas; St. Jan; Virgin Gorda.—West Indies; Mexico to Colombia and Peru. VISCID MALLOW.

2. *Bastardia bivalvis* (Cav.) H. B. K. Nov. Gen. 5: 198. 1821.

Sida bivalvis Cav. Diss. 1: 13. 1785.

Velvety-pubescent and viscid with glandular hairs, branched, 2 m. high or less. Leaves broadly ovate, petioled, 7 cm. long or less, crenate-dentate, cordate, acute or acuminate; pedicels not longer than the calyx, shorter than the petioles; calyx about 6 mm. long, its segments lanceolate, acuminate; petals yellow, a little longer than the calyx; capsule not longer than the calyx, its carpel-valves with short subulate beaks.

Fields near Coamo, between Serillos and Salinas, collected only by Sintenis:—Jamaica; Cuba; Hispaniola; tropical America. Recorded by Krebs as formerly found on St. Thomas.

8. **MALACHRA** L. Sp. Pl. ed. 12, 458. 1767.

Hirsute or pubescent perennial herbs or shrubs, with various, mostly long-petioled, dentate or lobed, subulate-stipulate leaves, and capitate, axillary or terminal, bracted, perfect exinvolucrate flowers, or with an involucre of subulate bractlets in one species. Calyx 5-cleft or 5-parted. Petals 5, inequilateral. Stamen-tube shorter than the petals, 5-toothed, bearing 15–30 filaments at about the middle. Ovary 5-celled, each cavity with 1 ovule; style subterete; stigmas 10. Carpels 5, obtuse, convex, reticulated. [Greek, mallow.] About 10 species, mostly of the American tropics. Known as MALVAVISCO. Type species: *Malachra capitata* L.

Involucre none.

Plants velvety stellate-pubescent, sometimes also with long hairs; petals yellow.

Plants hispid with long simple or also stellate hairs.

Petals yellow to reddish; stipules 1–1.5 cm. long; bracts cordate.

Bracts acute, the outer 2–2.5 cm. long.

Bracts acuminate, the outer about 1.5 cm. long.

Petals white; stipules 2–3 cm. long; bracts subcordate.

Involucre of subulate bractlets; petals pink or rose.

1. *M. capitata*,

2. *M. alceifolia*,

3. *M. urens*,

4. *M. fasciata*,

5. *M. radiata*.

1. **Malachra capitata** L. Syst. ed. 12, 2: 458. 1767.

Sida capitata L. Sp. Pl. 685. 1753.

Malachra palmata Moench, Meth. 615. 1794.

Erect, usually branched, velvety stellate-pubescent and often with some long whitish hairs, 6–15 dm. high. Leaves broadly ovate to suborbicular, dentate or 3–5-lobed, the lower ones up to 12 cm. long, the upper smaller; stipules 15 mm. long or less; heads few-several-flowered, mostly on axillary peduncles; outer bracts broadly ovate, conduplicate, cordate, acute, strongly nerved, velvety, 2–2.5 cm. long, the inner ovate, smaller; calyx 6–8 mm. long, its lobes ovate-lanceolate, obtuse; petals yellow, about 1 cm. long; carpels 2.5–3 mm. long.

Fields, roadsides, waste and cultivated grounds, Porto Rico, at lower and middle elevations; St. Croix:—Jamaica; Cuba; Hispaniola; Guadeloupe; Dominica; Martinique; Texas to Central America.

2. **Malachra alceifolia** Jacq. Coll. 2: 350. 1788.

Malachra rotundifolia Schrank, Pl. Rar. Mon. pl. 56. 1819.

Malachra alceifolia rotundifolia Guerke, in Mart. Fl. Bras. 12: 462. 1892.

Hispid with long yellowish, simple or stellate hairs, branched, erect, 5–20 dm. high. Lower leaves suborbicular or reniform-orbicular, cordate, dentate, or angulately lobed, 7–15 cm. broad, the upper smaller, broadly ovate; stipules 10 to about 15 mm. long; heads sessile or short-peduncled in the axils, several-flowered; outer bracts triangular-ovate, cordate, acute, veined, hispid, 2–2.5 cm. long, the inner smaller; calyx about 6 mm. long, its lobes lanceolate, aristate; petals yellow, 12–15 mm. long; carpels about 3 mm. long. [*M. capitata* of Krebs, of Grisebach, of Bello, of Stahl and of Eggers in part, not of Linnaeus.]

Fields thickets, waste and cultivated grounds, Porto Rico, at lower and middle elevations in moist districts; Mona; Icos; Vieques, Culebra; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies (except Bahamas); continental tropical America. MALVA DE CABALLO. BASTARD OKRA.

3. **Malachra urens** Poit.; Ledeb. & Adlerst. Diss. Pl. Doming. 22. 1805.

Malachra ciliata Poir. in Lam. Encycl. Suppl. 3: 578. 1813.

Low, branched, usually less than 5 dm. high, sparingly hispid with simple hairs, sometimes with stellate ones intermixed. Leaves ovate to ovate-lanceolate,

dentate, rarely slightly 3-lobed, 6 cm. long or less, the apex acute or obtuse, the base usually rounded; stipules 5–15 mm. long; heads subsessile in the axils, few-flowered; outer bracts triangular-lanceolate, acuminate, 10–15 mm. long, cordate, the inner smaller; calyx 4–5 mm. long, its lobes lanceolate, aristate; petals red, orange or yellow, about 15 mm. long.

Recorded as collected by Riedlé in Porto Rico (prior to 1800) but not seen by subsequent collectors; also recorded by Eggers from St. Thomas, perhaps erroneously:—Florida; Jamaica; Cuba; Hispaniola.

4. *Malachra fasciata* Jacq. Coll. 2: 352. 1788.

Hispid with long yellowish, simple or stellate hairs, simple or branched, 5–25 dm. high. Leaves suborbicular or ovate-orbicular, dentate, 3–5-lobed, or 3–5-parted, the lower ones up to 1.5 cm. broad, the lobes acute or obtuse, the base obtuse or subtruncate, the upper leaves much smaller, ovate to lanceolate; stipules 2–3 cm. long; heads few-flowered, subsessile in the axils; outer bracts triangular-ovate, acuminate, subcordate, 25 mm. long or less; calyx about 5 mm. long, its lobes lanceolate, aristate; petals white, about 10 mm. long; carpels about 3 mm. long. [*M. radiata* of Krebs, of Grisebach, of Bello and of Stahl, not of Linnaeus.]

Waste grounds, Porto Rico; St. Thomas (according to Guerke):—Jamaica; Cuba; Antigua to Trinidad; continental tropical America.

5. *Malachra radiata* L. Syst. ed. 12, 459. 1767.

Hispid with stiff yellowish, simple or stellate hairs, branched, 2.5 m. high or less. Leaves mostly deeply 3–5-parted, the larger ones 6–12 cm. broad, suborbicular in outline, cordate, the lobes oblong, acute or obtuse, dentate; upper leaves smaller, sometimes merely dentate; stipules about 1 cm. long or less; heads mostly terminal, dense, 10–20-flowered; involucre of 9–12 nearly filiform bractlets; calyx about 10 mm. long, its lobes acute; petals rose, a little longer than the calyx; carpels 3–4 mm. long.

Collected by Stevenson at Canovanas in 1916:—Cuba; Hispaniola; central America and northern South America; tropical Africa.

9. **URENA** [Dill.] L. Sp. Pl. 692. 1753.

Shrubs, pubescent or tomentose, with petioled various leaves, entire, serrate, lobed or cleft, palmately nerved, the midvein and sometimes two of the lateral veins bearing an oblong gland on the under side at the base, the stipules setaceous. Flowers rose-colored to purple, axillary, mostly solitary, and sometimes few together at the ends of branches, involucre. Involucre campanulate, 5-cleft. Calyx deeply 5-cleft. Petals obovate or subtruncate, cuneate. Stamen-tube about as long as the petals. Ovary depressed-globose, tubercled, 5-celled; ovules 1 in each ovary-cavity, ascending; style 10-cleft; stigmas discoid. Carpels 5, echinate, glochidiate. [Malabar name]. A few slightly differing species, regarded by some authors as races of a single species, widely distributed in tropical and subtropical regions, known as CADILLO. Type species: *Urena lobata* L.

Leaves, at least the lower, as wide as long or wider.

Leaves angulately lobed.

Leaves deeply palmately lobed.

Leaves longer than wide, some of them 3-lobed.

1. *U. lobata*.

2. *U. sinuata*.

3. *U. trilobata*.

1. *Urena lobata* L. Sp. Pl. 682. 1753.

Urena americana L.f. Suppl. 308. 1781.

Urena reticulata Cav. Diss. 6: 335. 1788.

Urena viminea Cav. Diss. 6: 335. 1788.

Erect, branched, 5–20 dm. high, the branches stellate-pubescent. Leaves suborbicular, commonly somewhat broader than long, angulately lobed and

dentate, 2–12 cm. long, or the upper ones ovate or oblong and merely dentate, dark green above, whitish-tomentose beneath, the base cordate, rounded or narrowed; flowers short-peduncled: involucre and calyx 5–9 mm. long; petals 12–15 mm. long; carpels tomentose, about as long as the calyx or somewhat longer, densely echinate.

Fields, hillsides, waste and cultivated grounds at lower and middle elevations in moist districts, Porto Rico; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Florida; West Indies (except Bahamas); continental tropical America and Old World tropics.

2. *Urena sinuata* L. Sp. Pl. 692. 1753.

Erect, branched, 5–10 dm. high, the branches stellate-pubescent or glabrate. Leaves reniform-orbicular, mostly wider than long or as wide, the larger ones about 8 cm. long or less, serrate, palmately lobed or deeply palmatifid, the lobes acute or obtuse, with rounded sinuses, the middle lobe usually the largest, the upper side dark green, the under side pale-tomentulose; flowers and fruit similar to those of *U. lobata*, the involucre and calyx sometimes smaller. [*Urena Svarzii* of Krebs.]

Fields, waste and cultivated grounds at lower and middle elevations, Porto Rico; St. Thomas; West Indies (except Bahamas); continental tropical America and Old World tropics.

3. *Urena trilobata* Vell. Fl. Flum. 286. 1825.

Similar to the two preceding species, differing by its broadly ovate leaves, 10 cm. long or less, distinctly longer than wide, more or less deeply 3-lobed and irregularly crenate-dentate, the lobes obtuse or acutish, the sinuses mostly acute.

Waste and cultivated grounds, Porto Rico; St. Croix:—Hispaniola; Guadeloupe; Guiana and Brazil.

10. **PAVONIA** Cav. Diss. 3: 132. 1787.

Shrubs or shrubby herbs. Leaves alternate, stipulate, toothed, angled or lobed. Flowers perfect, commonly solitary on axillary peduncles. Involucre of 5–15 bractlets. Calyx 5-lobed. Petals 5. Carpels 5, 1-celled; styles 10; stigmas capitate; ovules solitary. Mature carpels separating from axis, 1–3-awned on the back, more or less deeply 2-valved. Seeds solitary, ascending. [In honor of Joseph Pavon, Spanish botanist and explorer.] Ten species or more, mostly of tropical distribution, the following typical.

1. *Pavonia spinifex* (L.) Cav. Diss. 3: 133. 1787.

Hibiscus spinifex L. Syst. ed. 10, 1149. 1759.

Malach spinifex Kuntze, Rev. Gen. Pl. 70. 1891.

A branching shrub, 1–3 m. tall, hirsute and strigillose. Leaves ovate or oblong-ovate, 5–10 cm. long, acute or somewhat acuminate, doubly crenate-dentate, truncate or subcordate at the base, the petioles densely pubescent; peduncles axillary, much longer than the petioles; bractlets of the involucre 5, linear to lanceolate, acute, nearly 1 cm. long; calyx about as long as the bractlets, its lobes lanceolate to ovate-lanceolate; petals yellow, 2.5 cm. long, cuneate; carpels 5–6 mm. high, with 1 medial and 2 lateral retrorsely barbed awns.

Hillsides, banks and thickets, waste and cultivated grounds, Porto Rico, ascending to higher elevations; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—South Carolina to Florida; Bermuda; West Indies; continental tropical America. CADILLO ESPINOSO.

11. **TYPHALAEA** Neck. Elem. 2: 412. 1790.

[DIPLOPENTA Alef. Oest. Bot. Zeit. 13: 10. 1863.]

Perennial herbs or shrubs, with alternate, ovate, elliptic or lanceolate, dentate, stipulate leaves, and small perfect flowers clustered at the end of long terminal or axillary peduncles. Involucl of 5–10 linear or ovate distinct bractlets. Calyx 5-lobed. Petals 5. Carpels 5, each 1-celled; styles 10; stigmas capitate. Fruiting carpels hard, 2-valved, separating from the axis, bearing 3 retrorsely barbed awns. [Derivation not cited.] A few species, natives of tropical America, the following typical.

1. **Typhalaea fruticosa** (Mill.) Britton.*Sida fruticosa* Mill. Gard. Dict. ed. 8, no. 18. 1768.*Urena Typhalaea* L. Mant. 258. 1771.*Pavonia Typhalaea* Cav. Diss. 3: 134. 1787.*Diplopenta leptocarpa* Alef. Oest. Bot. Zeit. 13: 11. 1863.*Malache Typhalaea* Kuntze, Rev. Gen. Pl. 70. 1891.

Shrubby, erect or somewhat straggling, few-branched or simple, 5–20 dm. high, stellate-pubescent. Leaves elliptic to oblong-lanceolate, petioled, dentate or crenate-dentate, thin, 8–20 cm. long, loosely stellate-pubescent on both sides, the apex acuminate, the base narrowed or obtuse; flowers glomerate at the ends of long, mostly terminal peduncles; involucre-bractlets 5 or 6, ovate, acuminate, 8–10 mm. long; calyx campanulate, 6–7 mm. long; petals obovate, white, about 12 mm. long; carpels trigonous, ribbed on the back, their sides smooth, the middle awn about twice as long as the lateral ones.

Woods and thickets in wet or moist districts, Porto Rico, at lower and middle elevations, ascending into the eastern mountains:—Jamaica; Cuba; Hispaniola; St. Vincent; Trinidad; continental tropical America. ANAMU. CADILLO PEQUEQUE.

12. **MALACHE** B. Vogel; Trew, Pl. Sel. 50. 1772.

Tall shrubs or small trees, with alternate broad, lobed or nearly entire leaves, and large peduncled flowers solitary in the axils, or in terminal racemes. Involucre of several bractlets. Calyx 5-lobed. Petals 5, broad. Carpels mostly 5, 1-celled; styles 10; ovules solitary. Carpels 2-valved, knobbed on the back, not spined, coriaceous, tardily dehiscent. [Greek, mallow.] Three known species, of tropical America, the following typical.

1. **Malache scabra** B. Vogel; Trew, Pl. Sel. 50. 1772.*Pavonia spicata* Cav. Diss. 3: 136. 1787.*Pavonia racemosa* Sw. Fl. Ind. Occ. 2: 1215. 1800.*Althaea racemosa* Sw. Prodr. 102. 1788.*Malache spicata* Kuntze, Rev. Gen. Pl. 70. 1891.

An erect, usually little-branched shrub, 1–5 m. high, the branches and inflorescence densely roughish-pubescent. Leaves ovate to oblong-ovate, firm in texture, 5–15 cm. long, palmately veined, repand-dentate or entire, acuminate at the apex, subcordate or rounded at the base, the petioles 3–6 cm. long; racemes loosely several-flowered; pedicels ascending, 2–5 cm. long; involucre-bractlets oblong-lanceolate, about 1 cm. long; calyx as long as or a little longer than the bractlets, its lobes ovate, acute; petals yellowish, about twice as long as the calyx, finely pubescent, longer than the stamen-column; carpels somewhat shorter than the calyx, with 2 short blunt beaks on the upper margins and a short terminal crest.

Borders of coastal swamps and wet coastal woods, Porto Rico; St. Croix (according to Eggers):—Florida; West Indies; coasts of continental tropical America. SWAMP BUSH. CADILLO DE CIENEGA.

13. **LEBRETONIA** Schrank, Pl. Rar. Hort. Monac. pl. 90. 1819.

Herbs or shrubs with alternate stipulate, toothed or lobed leaves and perfect flowers in panicles, or sometimes solitary. Involucels of several distinct bractlets. Calyx 5-lobed. Petals 5. Carpels 5; styles 10; ovules solitary. Fruiting carpels 2-valved, roughened, without spines or awns. Seeds solitary. [Commemorates F. Le Breton, a French botanist who died about 1790.] Perhaps 40 species, of tropical distribution. Type species: *Lebretonia coccinea* Schrank.

1. **Lebretonia paniculata** (Cav.) Britton.

Pavonia paniculata Cav. Diss. 3: 135. 1787.

Althaea corymbosa Sw. Prodr. 101. 1788.

Pavonia corymbosa Willd. Sp. Pl. 3: 836. 1801.

Malachra cordata Poir. in Lam. Encycl. Suppl. 3: 578. 1813.

Malache paniculata Kuntze, Rev. Gen. Pl. 70. 1891.

Shrubby, branched, erect, 1-3 m. high, the branches hirsute and with small stellate hairs. Leaves broadly ovate to suborbicular, membranous, petioled, cordate, crenate-dentate, more or less hirsute, the apex acute or acuminate, the lower 8-12 cm. long; flowers corymbose-paniculate, commonly numerous; involucre-bractlets 6-8, linear, hirsute, a little longer than the calyx; calyx-lobes triangular, acuminate; petals yellow, about twice as long as the calyx; carpels 3-4 mm. long, ribbed and reticulated, obtuse. [*Pavonia coccinea* of Stahl, not of Cavanilles.]

Wet grounds near Bayamon and Lares, Porto Rico; Hispaniola; Guadeloupe; continental tropical America. CADILLO ANARANJADO.

14. **HIBISCUS** L. Sp. Pl. 693. 1753.

Herbs, shrubs, or in tropical regions even small trees, with dentate or lobed leaves, and showy, mostly campanulate flowers. Bractlets of the involucre numerous, narrow. Calyx 5-cleft or 5-toothed. Column of stamens anther-bearing below along much of its length. Ovary 5-celled, the cavities 3-several-ovuled; style-branches 5, stigmatic at the capitate summit. Capsule 5-valved. Seeds reniform. [An ancient name, used by Dioscorides for the marsh mallow.] About 180 species, widely distributed, known as BUENOS DIAS in Porto Rico. Type species: *Hibiscus Trionum* L.

A. Seeds covered with cotton-like wool.

B. Seeds glabrous or pubescent.

1. Calyx and involucre herbaceous; shrubby species.

a. Involucre-bractlets 2-forked at the summit.

Leaves not lobed or with low, obtuse lobes; stem not prickly.

Leaves deeply 3-5-lobed, the lobes acuminate; stem short-prickly.

b. Involucre-bractlets not 2-forked.

*Capsule not 5-winged.

Involucel-bracts many; leaves lobed.

Sparingly pubescent; leaves sharply 3-5-lobed;

stem prickly; petals rose, glabrous.

Densely velvety; leaves obtusely lobed; stem

unarmed; petals yellow, velvety.

Involucel-bracts few; leaves serrate, not lobed.

**Capsule 5-winged; petals yellow with purple bases.

2. Calyx and involucre becoming fleshy; herbaceous species.

1. *H. brasiliensis*.

2. *H. furcellatus*.

3. *H. bifurcatus*.

4. *H. trilobus*.

5. *H. clypeatus*.

6. *H. Rosa-sinensis*.

7. *H. vitifolius*.

8. *H. Sabdariffa*

1. **Hibiscus brasiliensis** L. Sp. pl. ed. 2, 977. 1763.

Hibiscus phoeniceus Jacq. Hort. Vind. 3: 11. 1776.

Bombicella betulina Bello, Anal. Soc. Esp. Hist. Nat. 10: 241. 1881.

Bombicella phoenicea Bello, loc. cit. 1881. 1881.

A shrub, 3-10 dm. high, somewhat stellate-pubescent, or glabrate, branched, the branches slender. Leaves thin, petioled, ovate or rhombic-ovate, the larger

ones 4–8 cm. long, coarsely dentate, the apex acuminate, the base obtuse, subtruncate or subcordate; stipules subulate, 4–7 mm. long; flowers solitary in the upper axils on slender peduncles often longer than the leaves; involucre-bractlets 9–10, linear, acuminate, 1–2.5 cm. long; calyx about 1 cm. long, its lobes ovate, acuminate; petals pink, purple or white, about twice as long as the calyx; capsule about 1 cm. long; seeds densely woolly.

Plains, hillsides and thickets at lower elevations in dry parts of the southern and southwestern districts of Porto Rico, extending north to Punta Casabe on the western coast; St. Croix; St. Thomas;—Jamaica; Cuba; Hispaniola; St. Barts; Curaçac; continental tropical America. Recorded from St. Kitts to St. Vincent; commonly cultivated. Erroneously recorded from the Bahamas. Pink-flowered and white-flowered plants sometimes grow side by side.

2. **Hibiscus furcellatus** Lam. Encycl. 3: 358. 1789.

Shrubby, 1–2 m. high, densely stellate-tomentulose, somewhat branched or simple, rather stout. Leaves long-petioled, suborbicular or ovate-orbicular, the larger 8–12 cm. long, dentate or somewhat 3–5-lobed, the apex acute, the base deeply cordate, pale beneath, stellate-canescens; upper leaves much smaller; flowers showy, stout-peduncled in the upper leaf-axils; involucre-bractlets 10–14, linear, bifurcate, hirsute, 10–16 mm. long; calyx 15–20 mm. long, its triangular-lanceolate lobes acute; petals 6–8 cm. long, rose-pink; capsule a little shorter than the calyx; seeds glabrous, minutely papillate. [*H. tomentosus* of Stahl, not of Miller; *H. fraternus* of Sessé & Mocino, not of Linnaeus.]

Moist or wet grounds on the northern coastal plain of Porto Rico and along a stream up to 600 m. elevation in the Naguabo Mountains;—Florida; Cuba; Dominica; continental tropical America; recorded from the Sandwich Islands.

3. **Hibiscus bifurcatus** Cav. Diss. 3: 146. 1787.

Shrubby, branched, pubescent with simple hairs, at least above, up to 2 m. high, or vine-like and sometimes 5 m. long, the branches and petioles aculeate with short, broad-based prickles 0.5–1 mm. long. Leaves broad, sparingly pubescent, long-petioled, 3-lobed, cordate, the larger up to 10 cm. wide, the lobes ovate to lanceolate, dentate, acute or acuminate; upper leaves much smaller, commonly deciduous; flowers stout-peduncled in the upper axils, showy; involucre-bractlets 9–13, 1.5–2 cm. long, linear, bifurcate, hirsute; calyx about as long as the involucre, its lobes deltoid, acute; petals pink or rose, sometimes with a darker base, 7–9 cm. long; capsule sericeous, about as long as the calyx; seeds glabrous, minutely papillate. [*H. ficulneus* of Sessé & Mocino, not of Linnaeus.]

Thickets, fields and river-banks, in moist or wet districts, Porto Rico, ascending to higher elevations;—Jamaica; Cuba; Guadeloupe; Martinique; Trinidad; continental tropical America. Recorded by Krebs as found in St. Thomas prior to 1851.

4. **Hibiscus trilobus** Aubl. Pl. Guian. 2: 708. 1775.

Hibiscus domingensis Jacq. Icon. Rar. 3: pl. 550. 1786–93.

Shrubby, somewhat pubescent above, the branches armed with stout prickles about 2 mm. long. Leaves slender-petioled, broadly ovate in outline, thin, glabrate, cordate, 3-lobed, 8 cm. long or less, the lobes ovate, dentate, acute or acuminate; flowers large, axillary; involucre-bractlets about 12, narrow; petals rose.

Lake Guanica, near La Plata, Porto Rico;—Hispaniola; Trinidad, recorded from Jamaica.

5. **Hibiscus clypeatus** L. Syst. ed. 10, 1149. 1759.

A velvety-tomentose shrub, 2–5 m. high, with stout branches. Leaves suborbicular, long-petioled, 6–15 cm. long, cordate, velvety on both sides, angulately 3-lobed, irregularly dentate, the lobes obtuse or acute; flowers stout-peduncled in

the upper axils; involucre-bractlets about 10, linear 2-3 cm. long; calyx as long as or a little longer than the involucre, its broad, ovate lobes acute; petals dull yellow, velvety, 5-6 cm. long; capsule densely hirsute; longer than the calyx; seeds globose, glabrous.

Woods and thickets, vicinity of Guanica, Porto Rico; St. Croix (according to West):—Jamaica; Cayman Islands; Hispaniola.

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

A shrub, 2-3 m. high, sometimes becoming a tree up to 5 m. high, glabrous, or the young twigs sparingly pubescent. Leaves ovate to ovate-lanceolate, acute at the apex, rounded or abruptly narrowed at the base, 7-20 cm. long, coarsely unequally dentate; bractlets narrowly linear, about half as long as the calyx; calyx-lobes lanceolate, pubescent, especially within; petals rose-red, purple or white, 10-15 cm. long; capsule about 2.5 cm. long.

Occasionally escaped from Porto Rico and Virgin Island gardens, where it is commonly planted. Native of tropical Asia. Widely cultivated in many races and spontaneous in tropical and subtropical regions. AMAPOLA. CANDELADA. PAVONA. CHINESE ROSE.

7. *Hibiscus vitifolius* L. Sp. Pl. 696. 1753.

Shrubby, finely velvety and with some longer simple hairs, erect, branched, 6-10 dm. high. Leaves long-petioled, suborbicular, velvety, cordate, angulately 3-5-lobed, dentate, the larger ones 6-12 cm. wide; flowers slender-peduncled in the axils; involucre-bractlets about 10, setaceous, 1-1.5 cm. long; calyx somewhat longer than the involucre, its lobes ovate, acute or subacuminate; petals yellow with a purple base, 3-5 cm. long; capsule subglobose, 5-winged, shorter than the accrescent calyx; seeds papillose.

Thickets and waste grounds, St. Croix; St. Thomas; Tortola:—Jamaica; Cuba; Hispaniola; St. Kitts to Barbados; native of the East Indies.

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

Herbaceous, annual or biennial, branched, erect, 1.5 m. high or less, the stem, branches and leaves glabrous. Leaves various, long-petioled, serrate, nearly entire, lobed or palmately 3-5-parted, the lower up to 2 dm. broad, the lobes ovate to lanceolate, acute; upper leaves often narrowly lanceolate; flowers short-peduncled in the upper axils, the involucre and accrescent calyx becoming red and fleshy; involucre-bractlets about 10, pubescent below, 10-12 mm. long, lanceolate, entire; calyx about 2 cm. long in flower, becoming 3-3.5 cm. long in fruit, its lobes lanceolate, acuminate; petals rose, 4-5 cm. long; capsule ovoid, 2-2.5 cm. long; seeds minutely stellate-pubescent.

Occasionally spontaneous after cultivation in Porto Rico; St. Croix; St. Thomas:—Florida; Cuba; Guadeloupe to Trinidad; continental tropical America. Native of the Old World tropics. Widely cultivated for its fleshy, acid calices which are dried and used in making jellies, sauces and refreshing drinks. JAMAICA or RED SORREL. VIÑA.

Hibiscus cannabinus L., PAVONA ENCENIDA, East Indian, grown in Porto Rico gardens, is a somewhat prickly, annual or biennial herb yielding a strong coarse fiber, the rather slender stems 6-10 dm. high, the leaves various, some of them palmatifid with 5 to 7 lanceolate, serrate lobes, the short-peduncled axillary flowers with lanceolate bristly sepals, the petals 5-7 cm. long, yellow with a purplish base or purple. [*H. radiatus* Cav.]

Hibiscus schizopetalus (Mart.) Hook. [*Hibiscus Rosa-sinensis schizopetalus* Mart.] LIRA, native of tropical Africa, is a shrub, with foliage similar to that of *H. Rosa-sinensis*, the flowers with lacinate petals. It is grown for ornament in Porto Rico and Virgin Island gardens.

Hibiscus mutabilis L., MARAVILLA, CHANGEABLE ROSE, native of tropical Asia, grown in Porto Rican and Virgin Island gardens, is a large shrub with broad cordate angular-lobed, stellate-pubescent leaves, and large red flowers changing to white.

Hibiscus micans Cav., Javan, **H. maculatus** Lam. and **H. domingensis** Jacq. of Santo Domingo, all listed by Krebs as found in St. Thomas, are apparently errors in record or identification.

A large collection of hybrid *Hibiscus*, formed by Mr. McClelland, Horticulturist of the Mayaguez Experiment Station, was seen with interest and appreciation in 1924, many of the kinds of great beauty and very desirable for tropical gardens.

15. **ABELMOSCHUS** Medic. Malv. 45. 1787.

Tall herbs, with broad lobed leaves, and large axillary and terminal flowers. Bractlets several or numerous, narrow. Calyx spathaceous, splitting along one side, deciduous. Stamen-column bearing numerous anthers. Ovary 5-celled, its cavities several-ovuled; style-branches 5, stigmatic at the summit. Capsule elongated, 5-valved. [Name said to be Arabic.] A few species, natives of the Old World. Type species: *Abelmoschus moschatus* Medic.

1. **Abelmoschus esculentus** (L.) Moench. Meth. 617. 1794.

Hibiscus esculentus L. Sp. Pl. 696. 1753.

Annual, erect, little-branched, 1-2 m. tall, sparingly hirsute. Leaves long-petioled, nearly orbicular in outline, 1-3 dm. broad, deeply 5-7-lobed, the lobes lanceolate to obovate, irregularly serrate, acute or obtuse; peduncles stout, 1-3 cm. long; bractlets linear, bristly-hirsute, about 1.5 cm. long; calyx about 2 cm. long; petals broad, yellowish, purple-blotched at the base, 3-4 cm. long; capsule angled, 2 dm. long or less, long-tipped.

Occasionally spontaneous after cultivation, Porto Rico; St. Croix; St. Thomas; St. Jan. Native of the Old World tropics; widely cultivated for food and locally spontaneous in tropical and subtropical regions. OKRA. GUINGAMBO. MOLDRON. GUMBO. KINKAMBOO.

Abelmoschus Abelmoschus (L.) Cook & Collins, ALGALIA, East Indian, occasionally grown in Porto Rico and Virgin Island gardens for its musk-scented seeds, is annual or biennial, 2 m. high or less, hispid-pubescent, with hastate or suborbicular, variously lobed leaves, yellow flowers 8-10 cm. broad, and a bristly capsule 6-8 cm. long. [*Hibiscus Abelmoschus* L.; *Abelmoschus moschatus* Medic.]

16. **PARITI** Adans. Fam. Pl. 2: 401. 1763.

Trees, with broad cordate petioled leaves, large deciduous stipules, and large, terminal or axillary flowers, solitary or few together, the petals yellow or changing to red. Involucre 8-10-toothed. Calyx 5-toothed. Style pubescent above, 5-cleft, the stigmas broad. Capsule loculicidally 5-celled, many-seeded, the cells vertically partitioned by a dissepiment which splits at dehiscence into two membranes. [Name said to be Malabaric.] A few species of tropical regions, the following typical.

1. **Pariti tiliaceum** (L.) St. Hil. Fl. Bras. Merid. 1: 256. 1827.

Hibiscus tiliaceus L. Sp. Pl. 694. 1753.

Hibiscus elatus Sw. Prodr. 102. 1788.

Paritium elatum G. Don, Gen. Syst. 1: 485. 1831.

A tree, sometimes 18 m. high, the young foliage velvety-tomentose. Leaves long-petioled, the blades 7-20 cm. broad, nearly orbicular, cordate at base, ab-

ruptly acuminate at apex, shallowly dentate or subentire, the venation prominent beneath; involucre 10-left, about 12 mm. long; petals yellow, obovate, 5-6 cm. long; calyx about 2 cm. long; capsule ovoid, tomentose, 15-18 mm. long; seeds glabrous or minutely downy.

Banks, thickets and forests borders, Porto Rico, ascending to higher elevations; St. Thomas; St. Jan; St. Croix (according to West);—Florida; Bermuda; West Indies; continental tropical America and Old World tropics. The hard, strong durable wood is greenish, used for furniture, for railroad ties and in construction. The fibrous bark is largely made into ropes and cordage. MAHOE. MAJAGUA. EMAJAGUA.

17. **THESPESIA** Soland.; Correa, Ann. Mus. Paris 9: 290. 1807.

Shrubs or trees. Leaves alternate, entire or merely angulately lobed, commonly ample, usually cordate, petioled. Flowers perfect, showy. Involucre of 3-5 narrow deciduous bractlets. Calyx truncate or nearly so, persistent. Petals 5. Ovary sessile, 5-celled; styles 5, united or rarely distinct; stigmas decurrent on the styles. Ovules few in each cavity. Capsule firm, woody-leathery, 5-celled, indehiscent. Seeds pubescent; cotyledons black-punctate. [Greek, marvellous.] About 8 tropical species, the following typical.

1. **Thespesia populnea** (L.) Soland.; Correa, Ann. Mus. Paris 9: 290. 1807.

Hibiscus populneus L. Sp. Pl. 694. 1753.

A tree, sometimes 20 m. high, with a trunk up to 6 dm. in diameter, usually smaller, often a shrub, the stout twigs scurfy when young, the wood hard, brown and heavy, the outer bark gray, shallowly fissured, the inner bark fibrous. Leaves firm in texture, slightly fleshy, shining, ovate-orbicular, 5-12 cm. long, acuminate at the apex, cordate at the base, undulate-margined; petioles nearly as long as the blades; peduncles shorter than the petioles; calyx subhemispheric, nearly truncate; petals 4-7 cm. long, yellow with a purple base, changing to purple; fruit depressed-globose, leathery, 3-4.5 cm. in diameter, 1.5-2 cm. high.

Coastal woods and thickets and borders of mangrove swamps, Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—Florida; Bermuda; West Indies; continental tropical America and Old World tropics. The wood has a specific gravity of about 0.8. The tree is often planted for shade and ornament in Porto Rico and the Virgin Islands. CORK-TREE. SPANISH CORK. EMAJAGUILLA. PALO DE JAQUECA. SANTA MARIA. BENDY-TREE. OTAHEITE.

18. **MONTEZUMA** Sessé & Moc.; DC. Prodr. 1: 477. 1824.

[MAGA Urban, Symb. Ant. 7: 281. 1912.]

Trees, with alternate petioled, broadly ovate, cordate entire leaves, small deciduous stipules, and large perfect showy solitary axillary or subterminal flowers. Involucre of 3 small deciduous bractlets. Calyx cyathiform or subcampanulate, nearly truncate, circumscissile near the base after flowering, and deciduous. Petals 5, very large. Ovary 3-4-celled, sessile; styles united; stigmas 3 or 4, slightly dilated; ovules few or several in each cavity. Fruit fleshy or leathery, indehiscent. Seeds glabrous; cotyledons not punctate. [Dedicated to the famous Aztec ruler, who died in 1520.] Two known species, the following typical, the other Cuban.

1. **Montezuma speciosissima** Sessé & Moc.; DC. Prodr. 1: 477. 1824.

Thespesia grandiflora DC. Prodr. 1: 456. 1824.

Maga grandiflora Urban, Symb. Ant. 7: 281. 1912.

A tree, up to about 15 m. in height with a trunk 3 dm. in diameter, the thick gray bark deeply fissured, the rather stout twigs lepidote when young. Stipules

3-4 mm. long; leaves chartaceous, orbicular-ovate, long-petioled, 5-20 cm. long, 5-7-nerved, lepidote beneath, the apex acute or acuminate, the base cordate or occasionally subtruncate; peduncles stout, mostly longer than the petioles; involucre-bracts linear, 1-2 cm. long, caducous; calyx about 2 cm. long, coriaceous, lepidote; petals obliquely triangular-obovate, 7-9 cm. long, deep rose shading to crimson within, tomentulose without; anthers bright yellow, in 5 double rows; fruit smooth, subglobose, 3-5 cm. in diameter; seeds obovoid.

Woods and hillsides, at lower elevations, central and western districts of Porto Rico. Commonly planted as a roadside shade tree, its very showy flowers conspicuous. Endemic. Erroneously attributed to Mexico. Its valuable wood is hard, durable, brown, strong and heavy, used for furniture, interior house-work, musical instruments, posts and piles. MAGA.

19. **CIENFUEGOSIA** Cav. Diss. 3: 172. 1787.

Low shrubs, or woody perennial herbs, with petioled, entire or lobed leaves, caducous stipules and axillary perfect solitary long-peduncled yellow flowers. Involucre of 5-9 narrow bractlets. Calyx 5-parted. Petals 5, convolute, rounded or obcordate, short-clawed. Stamen-tube shorter than the petals; ovary 3-4-celled; ovules 3-5 in each cavity, ascending; style filiform, 3-4-cleft at the apex, the stigmas capitate. Capsule ovoid, loculicidally 3-4-valved. Seeds pubescent or woolly. [Commemorates Bernard Cienfuegos.] About 20 species of tropical and subtropical regions. Type species: *Cienfuegosia digitata* Cav.

1. **Cienfuegosia heterophylla** (Vent.) Garcke, Bonplandia 8: 148. 1869.

Redoutea heterophylla Vent. Pl. Cels. pl. 11. 1800.

Fugosia heterophylla Spach, Hist. Veg. 3: 397. 1834.

A shrub, about 6 dm. high or less, glabrous or sparingly stellulate-pubescent, the slender branches ascending or decumbent. Leaves various, linear to oblong, elliptic or ovate, slender-petioled, entire, 3-5-nerved, 2-6 cm. long, acute or mucronulate; peduncles mostly as long as the leaves or longer; bractlets of the involucre 8 or 9, subulate, much shorter than the calyx; calyx about 15 mm. long, its lobes lanceolate, acuminate, with rows of black glands; petals cream or yellow, obliquely pencilled with deep maroon at base, 1.5-3 cm. long; capsule mucronate, about 1 cm. long; seeds densely woolly. [*Kosteletzkya pentasperma* of Eggers, not of Grisebach.]

Banks and hillsides, St. Thomas;—Florida; Cuba; Trinidad; Margarita; Curaçao; Aruba; Colombia to Brazil.

20. **GOSSYPIUM** L. Sp. Pl. 693. 1753.

Herbs, shrubs or small trees, with alternate petioled, usually lobed leaves, and large, mostly solitary, peduncled, yellow or white to purple flowers subtended by 3 broad, often cordate, incised bracts. Calyx truncate or 5-lobed. Stamen-column usually naked below. Ovary 5-celled; ovules numerous in each cavity; style club-shaped, 5-grooved; stigmas 5. Capsule coriaceous, loculicidally 3-5-valved. Seeds usually densely covered with long, white hairs (cotton); endosperm thin or none; cotyledons plicate. [Latin for cotton, perhaps of Arabic origin.] About 40 species, of tropical distribution, called ALGODON and COTTON. Type species: *Gossypium arboreum* L.

Cotton persistently attached to the seed.

Leaf-lobes short-acuminate.

Leaf-lobes long-acuminate

1. *G. hirsutum*.

2. *G. peruvianum*.

Cotton readily removed from the seed.

Seeds separate; capsule short-tipped.

Twigs strongly angled; petals little longer than the bracts.

Twigs faintly angled; petals twice as long as the bracts.

Seeds glomerate; capsule long-tipped.

3. *G. purpurascens*.

4. *G. barbadense*.

5. *G. brasiliense*.

1. ***Gossypium hirsutum*** L. Sp. Pl. ed. 2, 976. 1763.

A shrub, or small tree, up to 4 m. high, the young twigs pubescent or glabrate. Leaves ovate-orbicular or suborbicular in outline, cordate or nearly truncate at the base, usually 3-lobed, rarely 5-lobed, or some of them entire, the lobes short, ovate, acuminate, pubescent beneath, at least when young, nearly glabrous above; petals 3-6 cm. long, white or yellowish, sometimes crimson-blotched at the base, fading pink or purplish; capsule 2-2.5 cm. long; cotton firmly attached to the seed. [*G. barbadense* of Stahl, not of Linnaeus.]

Waste grounds, spontaneous after cultivation, Porto Rico:—Florida; Bahamas; Jamaica; Cuba; Grenada; recorded from other West Indian Islands; cultivated in tropical regions of the New World and the Old. WILD COTTON.

2. ***Gossypium peruvianum*** Cav. Diss. 6: 313. 1788.

Shrubby, perennial, up to 2 m. high, the slender twigs glabrous, striate. Leaves glabrous or pubescent, cordate, suborbicular in outline, 3-5-lobed or the upper ones ovate and entire; the lobes long-acuminate or acute; petals white, fading pink, perhaps sometimes yellow; capsules 4-5 cm. long, short-beaked; cotton firmly attached to the fuzzy seed, bright white.

Waste grounds, near Coamo Springs, 1922, persistent after cultivation: Vieques:—Cuba; Trinidad. Native of western South America. Our West Indian specimens have been determined by Mr. G. F. Freeman. PERUVIAN COTTON.

3. ***Gossypium purpurascens*** Poir. in Lam. Encycl. Suppl. 2: 369. 1811.

Perennial, shrubby or arborescent, up to 6 m. high, the angled twigs purplish, glabrate. Leaves suborbicular in outline, 3-lobed or some of them 5-lobed, usually somewhat stellate beneath, especially on the veins, 4-10 cm. broad, cordate, the lobes acuminate; petals 4-5 cm. long, little longer than the bracts, yellow, or tinged with purple; capsule ovoid, pointed, about 3 cm. long; cotton readily separable from the smooth separated seeds. [Specimens referred by Urban to *G. hirsutum* and to *G. barbadense* are cited as this species by Watts in "Wild and Cultivated Cottons," p. 252.]

Spontaneous after cultivation, Porto Rico:—Martinique; Guadeloupe; South America and Old World tropics. BOURBON COTTON. PORTO RICO COTTON.

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

Perennial, shrubby, flowering as an annual, glabrous or nearly so, 1-2.5 m. high, the twigs slightly angled. Leaves suborbicular in outline, 7.5-20 cm. broad, rather deeply 3-5-cleft, the lanceolate or ovate-lanceolate lobes acuminate, the basal sinus narrow; petals 8-10 cm. long, much longer than the bracts, yellow, or with orange or red bases, fading pink; capsules 3-5 cm. long; cotton readily separable from the smooth separated seeds.

Waste grounds and thickets, spontaneous or persistent after cultivation, Porto Rico; Culebra; St. Thomas; St. Croix. Widely cultivated and spontaneous in tropical and subtropical regions. This is the cotton most abundantly grown in Porto Rico at the present time.

5. ***Gossypium brasiliense*** Macfad. Fl. Jam. 1: 72. 1837.

Shrubby or subherbaceous, 1.5-2 m. high, or sometimes forming a small tree, glabrous or very nearly so throughout, the twigs angular, purplish. Leaves up to 2.5 dm. broad, cordate, deeply 5-lobed, or the upper much smaller and 3-

lobed, the lobes ovate or ovate-oblong, acute or acuminate; bracts 5-6 cm. long; petals yellow with darker bases, fading pink; capsule about 5 cm. long, long-beaked; cotton bright white, readily separable from the glomerate seeds. [Included by Urban in *G. barbadense* L.]

River-banks and waste grounds, spontaneous after cultivation, Porto Rico:—Cuba; Jamaica; Martinique; Tobago; continental tropical America and Old World tropics. KIDNEY COTTON.

Gossypium janiphaefolium Bello, Anal. Soc. Esp. Hist. Nat. 10: 242. 1881.

Described from plants observed on the plains of Cabo Rojo, called "ALGODON DE YUCA," because its leaves somewhat resemble those of Cassava (*Manihot*), being parted almost to the base into three segments, the middle segment divided again into 3 or 5 oblong-lanceolate lobes; the seeds are described as green and the cotton very white and compact. No specimens have been seen by other botanists. Search for the plant in the vicinity of Cabo Rojo has been fruitless.

Gossypium vitifolium Lam., CAUTO COTTON, was recorded by Schlechtendal as naturalized on St. Thomas; Eggers suggests that it may have been cultivated there formerly. It is an herbaceous perennial with purple or purplish stems, large, subcordate, 3-5-lobed leaves, the cotton readily separable from the black seeds.

Gossypium microcarpum Todaro, the "PORTO RICO COTTON" of Rohr, is not known in Porto Rico at the present time. It is related to *G. peruvianum*.

Althaea rosea (L.) Cav., HOLLYHOCK, Chinese, is successfully grown as a garden flower in Porto Rico and the Virgin Islands. Its wand-like stems are 1.5 to nearly 3 meters high, its rough suborbicular cordate lobed leaves often 15 cm. broad, its single or double flowers of nearly all colors, nearly sessile in the axils, 7-15 cm. broad. [*Alcea rosea* L.]

Family 4. BOMBACACEAE Schumann.

BOMBAX FAMILY.

Trees, with palmately compound or simple leaves and perfect flowers. Calyx inferior, mostly 5-toothed. Petals 5. Stamens commonly very numerous. Ovary 2-5-celled; style simple; stigmas as many as the ovary-cavities. Fruit various, dry or fleshy. Seeds usually woolly. About 20 genera and 150 species, of tropical distribution.

Leaves palmately compound.

Leaves simple.

Fruit drupaceous.

Fruit a long capsule.

1. *Ceiba*.

2. *Quararibea*.

3. *Ochroma*.

1. CEIBA Adans. Fam. Pl. 2: 399. 1763.

Large deciduous trees, with alternate petioled palmately compound leaves, and large clustered axillary flowers, the trunk buttressed at the base, the branches and young trunks spiny. Calyx 5-lobed. Petals tomentose without, glabrous within. Column 5-divided, each division bearing 2 or 3 unilocular anthers at the top. Capsule 5-celled, loculicidally dehiscent, many-seeded. Seeds long-woolly. [Aboriginal name.] About 12 species, the following typical.

1. *Ceiba pentandra* (L.) Gaertn. Fr. & Sem. 2: 244. 1791.*Bombax pentandrum* L. Sp. Pl. 511. 1753.*Eriodendron anfractuosum* DC. Prodr. 1: 479. 1824.

A tree, reaching a maximum height of 60 m. or more, the trunk above the often immense buttresses sometimes 3 m. in diameter. Petioles slender, glabrous, 5–15 cm. long; leaflets 5–7, stalked, or nearly sessile, glabrous, entire or serrate, oblong to oblanceolate, 8–15 cm. long, mostly acute or acuminate at the apex and narrowed at the base; flowers in many axillary clusters, often appearing before the leaves; pedicels 4–6 cm. long; calyx obconic, about 1.5 cm. long; petals about 3 cm. long, about as long as the stamens; stigma capitate; capsule oblong, woody, 8–12 cm. long.

Forests, hillsides and river-banks at lower elevations, Porto Rico, largest and most abundant in the dry southern districts; Vieques; St. Croix; St. Thomas; St. Jan.—West Indies; northern South America; Old World tropics. Often planted for shade; the woolly seeds are used for stuffing pillows. The wood is soft, light brown, weak, light in weight, not durable; it is used for boats, canoes, tubs, basins and in construction. SILK-COTTON TREE. CEIBA.

2. *QUARARIBAEA* Aubl. Pl. Guian 2: 691. 1775.

Aromatic trees or shrubs, with alternate simple entire or dentate leaves, and small solitary or clustered short-peduncled lateral flowers. Calyx tubular-obconic, 3–5-lobed. Petals 5. Stamen-column dentate at the top, bearing numerous sessile anthers. Ovary 2–3-celled, sessile; ovules 2 in each cavity; style very slender; stigma capitate or slightly lobed. Fruit subglobose, didymous, indehiscent, coriaceous. Seeds without endosperm. [Guiana name.] About 10 species, of tropical America. Type species: *Quararibaea guianensis* Aubl.

1. *Quararibaea turbinata* (Sw.) Poir. in Lam. Encycl. Suppl. 4: 636. 1816.*Myrodia turbinata* Sw. Prodr. 102. 1788.

A tree, up to about 10 m. high, the foliage glabrous, strongly odorous when dry, the bark smooth. Leaves submembranous, elliptic, entire, pinnately veined, 7–15 cm. long, the apex acute, obtuse or acuminate, the base narrowed or obtuse, the petioles 6–15 mm. long; peduncles shorter than the petioles; calyx 8–12 mm. long; petals nearly white, 8–12 mm. long, about as long as the stamen-column; fruit subglobose, striate, 1–2 cm. in diameter, usually 1-celled.

Forests and wooded hills in wet or moist districts at lower and middle elevations, Porto Rico; St. Jan; St. Croix (according to West);—Hispaniola; St. Eustatius to Grenada; continental tropical America. The flowers are peculiarly odorous. GARROCHO. SWIZZLE-STICK TREE.

3. *OCHROMA* Sw. Prodr. 97. 1788.

Rapidly growing trees, with broad alternate petioled, entire or angulate-lobed leaves and very large terminal flowers. Calyx 5-lobed. Petals 5. Stamen-column 5-toothed, bearing many spiral anthers. Ovary 5-celled; ovules many in each cavity; style sulcate above. Capsule linear, densely woolly within, loculicidally 5-valved. Seeds immersed in the woolly endocarp, obovoid, with a thin testa, fleshy endosperm and broad cotyledons. [Greek, referring to the large white flowers.] About 8 species of tropical America, the following typical.

1. *Ochroma pyramidale* (Cav.) Urban, Repert. Beihefte 5: 123. 1920.*Bombax pyramidale* Cav.; Lam. Encycl. 2: 552. 1786.*Ochroma Lagopus* Sw. Prodr. 98. 1788.*Bombax angulata* Sessé & Moc. Fl. Mex. ed. 2: 154. 1894.

A tree, up to 20 m. high with a smooth trunk sometimes 4 dm. in diameter, the twigs, petioles and under leaf-surfaces puberulent. Leaves suborbicular,

thin, cordate, entire, dentate or 3-5-lobed, palmately veined, 1.5-3 dm. broad, the stout petioles about as long as the blades; flowers solitary, stout-peduncled; calyx obconic, 6-8 cm. long, finely velvety, its suborbicular lobes about 2 cm. broad, with a prominent midvein; petals nearly white, obovate, puberulent, clawed, veiny, about 10 cm. long; capsule 1.5-3 dm. long, 2-3 cm. thick, the wool reddish.

Hillsides, forests and woodlands at lower elevations, Porto Rico;—Jamaica; Cuba; Hispaniola; Guadeloupe; Martinique; St. Vincent; Tobago; Trinidad; northern South America. The very light wood is nearly white, soft, with a specific gravity of only about 0.2; it is used for floats, rafts, stoppers and otherwise as a substitute for cork. The bark yields tannin, and a brown fiber used in making ropes. The woolly interior of the fruit is used for stuffing pillows and mattresses. A tree studied at Coamo reached a height of about 8 meters in 3 years' growth. GUANO. Balsa. CORKWOOD.

Adansonia digitata L., BAOBAB, African, planted for shade and for ornament on St. Croix and St. Thomas, and recorded by Eggers as naturalized prior to 1876 in shaded valleys on St. Croix, is a tree reaching a maximum height of about 20 meters, with a thick tapering trunk, recorded as up to 8 or 9 meters in diameter in its native habitat. Its leaves are digitately 3-7-foliolate; the pendulous white flowers are 1-1.5 dm. broad; the oblong woody fruit indehiscent, mealy within. Two trees were seen in the park at St. Thomas in 1924.

Pachira aquatica Aubl., South American, recorded as formerly planted on St. Croix, is a large tree, with long-petioled, digitately compound leaves of five or seven, oblong-lanceolate, entire acute leaflets, and large solitary flowers, the petals 2-3 dm. long, the filaments very numerous, in clusters, the capsular fruit about 1 dm. long. [*Carolina princeps* L.f.]

Pachira alba Walpers, also South American, planted on St. Thomas, is similar to *P. aquatica* but with smaller white flowers, the petals about 1 dm. long. A large tree was seen on the roadside at Bluebeard's Castle in March, 1924, then leafless. It has very remarkable and characteristic rough thick corky bark, green and yellow.

Bombax septentatam Jacq., a Colombian tree, was recorded by Krebs as seen in St. Thomas prior to 1851.

Family 5. STERCULIACEAE H. B. K.

CHOCOLATE FAMILY.

Herbs, shrubs or trees, with alternate, often stellate-pubescent leaves, the flowers regular, mostly perfect, in a few genera polygamous or unisexual, clustered or rarely solitary, usually axillary. Calyx deeply 5-cleft, usually persistent, the lobes or sepals valvate. Petals 5, hypogynous, or wanting. Stamens 5 or more; filaments mostly more or less united below into a cup or tube; anthers mostly 2-celled, extrorse; staminodia present in some genera. Ovary superior, 2-5-celled, or sometimes monocarpellary; styles usually as many as the ovary-cavities, distinct or more or less united. Fruit mostly capsular or follicular, rarely indehiscent. Seeds various, the cotyledons commonly foliaceous. About 45 genera and over 600 species, mostly tropical.

A. Anthers not borne on an elongated column (see *Ayenia*).

Petals flat or convolute.

Petals persistent; annual herb.

Petals deciduous or marcescent; shrubs.

Carpels 5.

Fruit capsular.

Involucels none.

Involucel-bracts 3.

Fruit 5-coccosus.

1. *Pentapetes*.

2. *Moluchia*.

3. *Riedlea*.

4. *Melochia*.

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|--|------------------------|
| Carpel only 1. | 5. <i>Waltheria</i> . |
| Petals concave or cucullate. | |
| Perennial herbs or low shrubs; capsule muricate. | 6. <i>Ayenia</i> . |
| Trees. | |
| Petals entire; fruit large, smooth, oblong. | 7. <i>Theobroma</i> . |
| Petals linear, 2-cleft; fruit small, subglobose, muricate. | 8. <i>Guazuma</i> . |
| B. Anthers borne on an elongated column; shrubs; fruit of 5 dehiscent follicles. | 9. <i>Helicteres</i> . |

1. **PENTAPETES** L. Sp. Pl. 698. 1753.

An annual herb, with alternate narrowly hastate leaves, and large red flowers, solitary and short-peduncled in the axils, subtended by 3 caducous bractlets. Calyx 5-parted, the segments narrow. Petals 5, broad. Stamencup short; stamens 5; anthers 15, in 5 sets of 3, erect, sagittate, borne between petal-like staminodes. Ovary 5-celled, sessile; ovules numerous; style slender, entire. Fruit a loculicidal capsule. [Greek, five leaved.] A monotypic Asiatic genus.

1. **Pentapetes phoenicea** L. Sp. Pl. 698. 1753.

Erect, branched, 6–10 dm. high, stellate-pubescent. Leaves lanceolate, petioled, 5–8 cm. long, crenate-serrate, the apex acuminate, the base hastate; stipules linear; peduncles scabrous, shorter than the petioles, nodding; flowers red-scarlet, 2–3 cm. broad; capsule subglobose.

Grown in Porto Rico gardens for ornament and occasionally escaped from cultivation to roadsides:—Cuba; Jamaica. Native of southern Asia. FLOS IMPIUS.

2. **MOLUCHIA** Medic. Malv. 10. 1787.

Herbs, shrubs or small trees, with toothed leaves, and small, terminal or axillary, mostly clustered, perfect flowers, the petals flat, marcescent. Involucels none. Calyx 5-cleft, usually campanulate. Petals 5, narrow. Stamens 5, the filaments somewhat united below, opposite the petals; staminodia none, or minute. Ovary 5-celled, each cavity 2-ovuled; styles 5, distinct at least above; stigmas clavate. Capsule pyramidal, loculicidally 5-valved, 5-seeded, the seeds obovoid, ascending. Endosperm fleshy; embryo straight; cotyledons flat. [Name altered from *Melochia*.] About 6 species, of tropical and subtropical regions. Type species: *Moluchia fruticosa* Medic.

Densely stellate-pubescent.
Glabrous or nearly so.

1. *M. tomentosa*.
2. *M. pyramidata*.

1. **Moluchia tomentosa** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 69. 1918.

Melochia tomentosa L. Syst. ed. 10, 1140. 1759.

A branched shrub, 2 m. high or less, rarely a small tree up to 4 m. high, the slender twigs, the leaves, inflorescence, calyx and capsule densely stellate-pubescent or tomentose. Leaves chartaceous, ovate to oblong-lanceolate, 1–6 cm. long, obtuse or acute at the apex, rounded, truncate or cordate at the base, crenate or serrate, the petioles shorter than the blades; peduncles at the axils of upper leaves or terminal, few-several-flowered; calyx-lobes lanceolate; petals violet, rose-pink or purple, obovate, 10–12 mm. long; capsule-body 6–8 mm. long, subulate-beaked, its angles rounded, knobbed.

Hillsides and thickets, at low elevations, mostly near the coasts, southern and eastern districts of Porto Rico; Desecheo; Mona; Muertos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda:—Florida; West Indies; Texas to tropical America. BROOM-WOOD. BRETONICA AFELFADA.

2. **Moluchia pyramidata** (L.) Britton, Mem. Brooklyn Bot. Gard. 1: 69. 1918.

Moluchia pyramidata L. Sp. Pl. 674. 1753.

Subherbaceous, nearly glabrous, the young foliage somewhat pubescent; stems slender, branched, ascending, decumbent or nearly erect, 2–6 dm. long; the young branches with a line of pubescence. Leaves membranous, lanceolate, ovate, or the lower nearly orbicular, 2–6 cm. long, sharply serrate, acute or acuminate at the apex, mostly rounded or subtruncate at the base, the slender petioles much shorter than the blades; peduncles pubescent, 1–few-flowered, about as long as the petioles, terminal or opposite the leaves; calyx-lobes lanceolate, 3–4 mm. long; petals pink, red or lavender, about 6 mm. long, obovate, capsule inflated, membranous, 6–7 mm. long, sharply 5-angled, short-beaked, each angle cuspidate at the base.

Fields, banks, hillsides and cultivated grounds at lower and middle elevations, Porto Rico, mostly in dry districts; Icacos; Vieques; St. Croix; St. Thomas (according to West and to Krebs); Tortola.—Texas; West Indies; continental tropical America and Old World tropics. BRETONICA PYRAMIDAL.

3. **RIEDLEA** Vent. Choix des Plantes pl. 37. 1803.

Herbs or low shrubs, the foliage mostly pubescent, the leaves dentate, the flowers in terminal or axillary clusters. Involucre-bracts 3. Sepals 5, distinct or nearly so, scarcely enlarged in fruit. Petals 5, flat, marcescent. Stamens 5, the filaments united below; staminodia minute or wanting. Ovary 5-celled; ovules 2 in each cavity. Styles 5, sometimes united below. Capsule 5-celled, loculicidally and septicidally dehiscent. [Commemorates Anselme Riedle, French botanical explorer.] About 20 species, of tropical and subtropical America, the following typical.

1. **Riedlea hirsuta** (Cav.) DC. Prodr. 1: 492. 1824.

Moluchia hirsuta Cav. Diss. 6: 323. 1788.

Riedlea serrata Vent. Choix des Plantes pl. 37. 1803.

Moluchia serrata St. Hil. & Naud. Ann. Sci. Nat. II. 18: 36. 1842.

Shrubby or subherbaceous, villous-pubescent, branched, prostrate, ascending or erect, 2–5 dm. high. Leaves ovate, 3–7 cm. long, thin, short-petioled, serrate, the apex acute or obtuse, the base rounded or subtruncate; flower-clusters axillary and forming a terminal spike; involucre-bracts longer than the calyx; calyx-lobes ovate; petals purple, 7–10 mm. long; capsule about as long as the calyx or shorter.

Sandy and gravelly soil at lower and middle elevations, Porto Rico, in moist districts.—Jamaica; Cuba; Hispaniola; Trinidad; continental tropical America. BRETONICA PELUDA.

4. **MELOCHIA** [Dill.] L. Sp. Pl. 674. 1753.

Herbs or shrubs, often stellate-pubescent, with petioled, serrate leaves and small, perfect flowers in axillary or terminal glomerules or panicles. Sepals or calyx-segments little enlarged in fruit. Petals convolute, marcescent. Stamens 5, opposite the petals; filaments more or less united below; staminodia none, or rarely present and minute. Ovary 5-celled; ovules 2 in each cavity; styles distinct, or united near the base. Fruit small, 5-coccous. Seeds with fleshy endosperm. [Arabic name.] About 25 species, natives of tropical and subtropical regions. Type species: *Moluchia corchorifolia* L.

1. *Melochia nodiflora* Sw. Prodr. 97. 1788.

Mougeotia nodiflora H. B. K. Nov. Gen. 5: 330. 1823.

A shrub, 2 m. high or less, with slender ascending branches, the young twigs sparingly pubescent. Leaves thin, ovate, 3–10 cm. long, serrate, glabrous or nearly so, acute or acuminate at the apex, rounded, truncate, or subcordate at the base, the slender pubescent petioles 1–3 cm. long; flowers nearly sessile, in dense axillary subglobose clusters; calyx-lobes triangular-lanceolate, acuminate, 2–3 mm. long; petals rose, a little longer than the calyx; filaments united; styles distinct; ovary 5-celled; young fruit deeply 5-lobed, at length separating into 5 pubescent carpels about 3 mm. long.

Banks, hillsides and thickets, Porto Rico at lower and middle elevations; Vieques; Culebra; St. Croix; St. Thomas; St. Jan.—West Indies; continental tropical America. BRETONICA PRIETA.

5. *WALThERIA* L. Sp. Pl. 673. 1753.

Herbs, shrubs or trees, with stellate and simple pubescence. Leaves toothed; stipules narrow. Flowers small, perfect, usually in axillary clusters or small cymes. Involucel of 3 deciduous bractlets. Sepals 5, united at the base into a turbinate 10-nerved tube. Petals 5, spatulate or obovate, convolute, withering-persistent. Stamens 5; filaments united below, not accompanied by staminodia; anthers with parallel sacs. Ovary 1-celled, sessile; style simple, not central; stigma club-shaped or brush-like. Ovules 2 in a cavity. Follicles 1-celled, 2-valved lengthwise. Seed solitary, ascending. Endosperm fleshy. Embryo straight, axile. [In honor of A. F. Walther, professor in Leipzig.] About 35 American species, mostly tropical, the following typical.

Leaves ovate to oblong; calyx about 5 mm. long.
Leaves suborbicular; calyx about 8 mm. long.

1. *W. americana*.
2. *W. calcicola*.

1. *Waltheria americana* L. Sp. Pl. 673. 1753.

Waltheria elliptica Cav. Diss. 6: 316. 1788.

Foliage tomentose. Stems 6–12 dm. tall, stiff; leaves ovate to oblong, 1–5 cm. long, serrate, rounded or cordate at the base, on stout petioles; flowers in dense sessile or peduncled axillary clusters; sepals subulate, about 5 mm. long, villous-hirsute, similar to the bractlets; petals yellow, slightly longer than the sepals; follicles 2.5–3 mm. long, pubescent at the top. [*W. indica* of Cook and Collins.]

Fields, banks and hillsides, at lower elevations, Porto Rico; Mona; Muertos; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda; Aneгада.—Florida; West Indies; continental tropical America and Old World tropics. BASORA PRIETA.

2. *Waltheria calcicola* Urban, Symb. Ant. 1: 475. 1900.

Shrubby, 4–8 dm. high, the foliage tomentulose. Leaves suborbicular, or obovate-orbicular, 1–3.5 cm. long, rounded or subtruncate at the base, the apex rounded, the margin crenulate; petioles slender, 1–3 mm. long; flowers capitate at the ends of branches; calyx-segments about 8 mm. long, triangular-lanceolate; petals yellow, a little longer than the calyx.

Limestone hills between Penuelas and Tallaboa, Porto Rico.—Jamaica.

6. *AYENIA* Loeffl. Iter. 257. 1758.

Shrubs, some species subherbaceous, with serrate petioled leaves, and axillary, mostly clustered, pedicelled flowers. Calyx 5-parted. Petals 5, concave or

hooded, long-clawed, the tip inflexed, adnate to the stamen-cup. Filaments united into a short cup, the anthers solitary in its sinuses, its truncate or rounded lobes alternate with the petals; anthers 3-celled. Ovary 5-celled, its cavities 2-ovuled; style short; stigma capitate or somewhat 5-lobed. Capsule subglobose, muricate, splitting into 5 carpels, each 2-valved. Seeds rugose; endosperm none; cotyledons spirally convolute. [In honor of the French botanist, Ayen.] About 10 species, natives of tropical America. Type species: *Ayenia sidaeformis* Loefl.

1. **Ayenia pusilla** L. Syst. ed. 10, 1247. 1759.

A low shrub or suffrutescent perennial herb, usually much-branched at the base, the slender branches ascending, erect or prostrate, 1-4 dm. long, puberulent. Leaves lanceolate, ovate, oval or suborbicular, 0.8-3 cm. long, puberulent or glabrate, sharply serrate, acute or obtuse at the apex, rounded or cordate at the base, the petioles 1-5 mm. long; pedicels longer than the petioles, sometimes 10 mm. long; calyx about 2 mm. long, its lobes lanceolate; claw of the petal much longer than the hooded limb; lobes of the stamen-cup longer than the anthers; capsule depressed-globose, densely muricate, 4-6 mm. in diameter.

Fields and hillsides at lower elevations, Porto Rico, in the dry southern and southwestern districts; Desecheo; Mona; Muertos; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Florida to Texas; West Indies; continental tropical America.

7. **THEOBROMA** L. Sp. Pl. 782. 1753.

Trees with large entire petioled leaves and small lateral or axillary flowers, solitary or clustered, on short peduncles. Calyx 5-cleft. Petals 5, clawed, the base concave or cucullate, the blade spatulate. Stamen-cup urceolate, its 5 lobes narrow, bearing 2 or 3 anthers in the sinuses. Ovary 5-celled, sessile; ovules numerous; style 5-cleft. Fruit large, woody, indehiscent, pendulous, pulpy within. Seeds numerous, without endosperm, the cotyledons thick, corrugated. [Greek, food for the gods.] About 7 species, natives of tropical America, the following typical.

1. **Theobroma Cacao** L. Sp. Pl. 782. 1753.

A small tree, sometimes 9 m. high, the twigs slender, pubescent. Leaves oblong or oblong-elliptic, thin, 1.5-2.5 dm. long, glabrous, pinnately veined and reticulated, the apex acuminate, the base narrowed or obtuse, the petioles 1-3 cm. long; flowers lateral on the trunk and branches, usually fasciated; peduncles very slender, 1-2.5 cm. long; calyx pubescent, about 7 mm. long, its segments acute; petals yellowish, about as long as the calyx; fruit oblong or subglobose, ridged, 1-2 dm. long; seeds oblong.

Sparingly spontaneous after cultivation for its seeds, Porto Rico; St. Croix. Widely cultivated in wet parts of tropical regions. Native of continental tropical America. CHOCOLATE-TREE. CACAO.

8. **GUAZUMA** Adans. Fam. Pl. 2: 382. 1763.

Trees, the young twigs and leaves stellate-tomentose or glabrate, the leaves alternate, serrate, short-petioled, more or less oblique, the small flowers in short-stalked, axillary cymes. Calyx 2-4-parted. Petals 5, cucullate, the apex inflexed and 2-cleft, the lobes linear. Stamen-cup bearing 5 staminodes and 5 sets of 3 anthers; anthers 2-celled. Ovary sessile, 5-lobed and 5-celled; ovules numerous; styles 5, more or less united. Fruit a subglobose woody tuberculate or setose capsule. Seeds with endosperm. [Name aboriginal.] Four or five species of tropical regions, the following typical:

1. **Guazuma Guazuma** (L.) Cockerell, Bull. Torr. Club 19: 95. 1892.

Theobroma Guazuma L. Sp. Pl. 782. 1753.

Guazuma ulmifolia Lam. Encycl. 3: 52. 1789.

Guazuma tomentosa H. B. K. Nov. Gen. 5: 320. 1821.

Guazuma ulmifolia tomentosa Schum. in Mart. Fl. Bras. 12: 81. 1886.

A tree, up to 20 m. high, the gray bark irregularly ridged and fissured, the trunk 3–6 dm. in diameter, the branches usually widely spreading. Leaves ovate to oblong-lanceolate, various, serrate, 6–12 cm. long, the apex acute or acuminate, the base obtuse or subcordate; flower clusters mostly longer than the petioles; petals whitish or yellowish, 3–4 mm. long, somewhat longer than the calyx; fruit globose or ellipsoid, purplish black, 1.5–2.5 cm. long, densely muricate.

Fields, hillsides, woodlands and forests at lower and middle elevations, Porto Rico; Vieques; St. Croix; St. Thomas; Tortola.—West Indies (except Bahamas); continental tropical America. Foliage mostly tomentose in dry regions, glabrate in wet or moist districts. GUACIMA. BASTARD CEDAR. WEST INDIAN ELM.

The fruit is used as fodder for horses; the brownish soft and tough wood has a specific gravity of about 0.6 and is used for posts and stakes; the bark yields a cordage fiber. Called JACKOCALALU in St. Thomas.

9. **HELICTERES** L. Sp. Pl. 963. 1753.

Pubescent shrubs or trees, the pubescence stellate or of branched hairs, with broad leaves and axillary or terminal, clustered or solitary flowers, the bractlets small, or distant from the calyx. Calyx tubular, 5-cleft or 5-toothed, somewhat 2-lipped. Petals 5, clawed. Stamen-column slender, elongated, bearing 5 or 10 sessile or short-stalked anthers; anther-sacs divergent or confluent. Ovary borne within the ring of stamens, 5-celled, 5-lobed, the cells many-ovuled; style 5, or united into 1; stigma small, capitate. Carpels distinct at maturity, twisted or straight, follicular, dehiscent along the ventral suture, many-seeded. Seeds warty or smooth; endosperm little; cotyledons foliaceous. [Greek, referring to the coiled carpels of some species.] Thirty species or more, of tropical distribution. Type species: *Helicteres Isora* L.

1. **Helicteres jamaicensis** Jacq. Enum. 30. 1760.

Helicteres spiralis Northrop, Mem. Torr. Club 12: 50. pl. 11. 1902.

A shrub, 1.5–3 m. high, or a small tree sometimes 6–7 m. tall, the foliage densely stellate-tomentose. Leaves ovate to ovate-lanceolate or ovate-oblong, 5–17 cm. long, mostly acute or acuminate at the apex, cordate or sometimes rounded at the more or less oblique base, crenulate nearly all around, the stout petioles 0.5–2.5 cm. long, the upper surface darker green than the lower; peduncles stout, 2–3 cm. long, 1–few-flowered; pedicels short; calyx 1.5–2 cm. long, 5-toothed, somewhat 2-lipped, densely tomentose; petals white, inequilateral, somewhat longer than the calyx; column 6–10 cm. long, declined; stamens 10; staminodia 5; ovary tomentose; carpels about 10, spirally twisted; densely tomentose, forming a cone-like, oblong fruit 2.5–5 cm. long.

Thickets, hillsides and woodlands at lower elevations, Porto Rico, mostly in dry districts; St. Croix; St. Thomas; St. Jan; Tortola.—Bahamas; Jamaica; Cuba; Hispaniola; St. Martin. COW-BUSH. HUEVO DE GATO. CUERNOCILLO.

Helicteres Isora L., a species of the Old World tropics, was listed in 1852 by Krebs as found in St. Thomas; if correctly determined it must have been planted there.

Helicteres ovata Lam., a Brazilian species, was also recorded from St. Thomas by Krebs, presumably in error.

Sterculia apetala (Jacq.) Karst., ANACAGUITAS, PANAMA TREE, a tree up to 20 m. high, with spreading branches, nearly smooth gray bark, nearly orbicular, peltate, 5-lobed leaves 2-3 dm. broad, and purplish apetalous flowers in large terminal panicles, is occasionally planted for shade in Porto Rico. Its fruit consists of 5 large leathery follicles. The tree is native of northern South America. [*Helicteres apetala* Jacq.; *Sterculia carthaginensis* Cav.]

Sterculia foetida L., East Indian, a fine tree about 15 meters high, seen on the University grounds, Rio Piedras, Porto Rico, in 1923, has long-petioled, digitately 5-7-foliolate leaves, with oblong acuminate leaf-segments 1-2 dm. long; the paniced pubescent odorous flowers are purplish, about 2 cm. broad.

Sterculia diversifolia G. Don, Australian, was seen as seedlings at the St. Croix Agricultural Experiment Station in 1923.

Dombeya spectabilis Bojer, Madagascan, grown for ornament in Porto Rico gardens, is a small tree up to about 6 m. high, with orbicular pubescent cordate serrate, sometimes slightly lobed leaves 10-15 cm. broad, the numerous white flowers 2 cm. broad, in dense peduncled corymbs.

Order 18. HYPERICALES.

Herbs, shrubs, or trees, the flowers mostly complete, perfect and regular (irregular in Violaceae). Sepals distinct, or more or less united, imbricated or convolute. Petals present and distinct, or wanting. Stamens usually numerous. Ovary compound, superior; placentae mostly parietal.

A. Stigmas not many-cleft.

1. Styles distinct or partly united or wanting (wholly united in some *Theaceae*).

- a. Leaves alternate (rarely opposite in *Taonabo*).

Ovary of a single carpel or carpels distinct.

Ovary compound.

Torus often enlarged after anthesis.

Torus not enlarged.

Epiphytic or saxicolous woody vines.

Trees or shrubs, not epiphytic.

- b. Leaves opposite or verticillate.

Flowers mostly dioecious or polygamous; trees or large shrubs.

Flowers perfect; herbs or low shrubs.

2. Styles completely united.

Corolla regular.

Anther-sacs opening by pores or valves.

Anther-sacs longitudinally dehiscent.

Stamens monadelphous.

Stamens mostly distinct (See *Samyda*)

Corolla irregular.

B. Stigmas many-cleft, brush-like, styles 3.

Fam. 1. DILLENACEAE.

Fam. 2. OCHNACEAE.

Fam. 3. MARCGRAVIACEAE.

Fam. 4. THEACEAE.

Fam. 5. CLUSIACEAE.

Fam. 6. HYPERICACEAE.

Fam. 7. BIXACEAE.

Fam. 8. CANELLACEAE.

Fam. 9. FLACOURTIACEAE.

Fam. 10. VIOLACEAE.

Fam. 11. TURNERACEAE.

Family 1. DILLENACEAE R. Br.

DILLENIA FAMILY.

Trees, shrubs or woody vines, with alternate simple leaves and perfect, rarely polygamous or dioecious flowers variously clustered. Sepals 3-5, imbricated, persistent. Petals 3-5, imbricated, deciduous. Stamens 10 or more, often numerous; filaments distinct, or united at the base; anthers 2-celled. Ovary superior, of 1 or several carpels; ovules 1 or many, anatropous; styles as many as the carpels. Fruit capsular or baccate. Seeds mostly arillate, with endosperm and thick cotyledons. About 10 genera and over 300 species, mostly tropical.

1. **DOLIOCARPUS** Roland, Vet. Akad. Handl. 17: 256. Hyponym.
1756.—Gmelin, Syst. 805. 1796.

Shrubs or woody vines, the leaves dentate or entire, pinnately veined, the small perfect flowers lateral or axillary, solitary or clustered, pedicelled. Sepals spreading. Petals hypogynous. Stamens many; filaments distinct, filiform; anthers extrorse, longitudinally dehiscent. Ovaries 1 or 2; ovules 1 or 2; styles 2, terminal; stigmas subcapitate. Fruit baccate. [Greek, cask-fruit.] About 20 species, of tropical America. Type species: *Doliosarpus Rolandri* Gmelin.

Ovaries 2; fruit didymous.
Ovary 1; fruit subglobose.

1. *D. calinoides*.
2. *D. brevipedicellatus*.

1. **Doliosarpus calinoides** (Eichl.) Gilg, in E. & P. Nat. Pfl. 3⁶: 114. 1893.

Pinzona calinoides Eichl. in Mart. Fl. Bras. 13¹: 71. 1863.

A glabrous vine, 5 m. long or longer, the branches angular. Leaves elliptic-ovate or elliptic-obovate, few-toothed or entire, 6–10 cm. long, the apex obtuse, rounded or acute, the base obtuse or subcordate, the stout petioles 1–2 cm. long; panicles axillary, several-many-flowered, much shorter than the leaves; pedicels short; sepals 4, about 2 mm. long; petals 3 or 4, obovate, a little longer than the sepals; ovaries 2; fruit didymous, about 5 mm. thick.

Forests of the eastern mountains and near Utuado, Porto Rico;—Guadeloupe; Trinidad. BEJUCO DE AGUA.

2. **Doliosarpus brevipedicellatus** Garcke, Linnaea 22: 47. 1849.

A high-climbing woody vine with terete branches, the twigs angular. Leaves ovate, coarsely serrate, 4–10 cm. long, slender-petioled, the apex acuminate or acute, the base narrowed and decurrent on the petiole; flowers lateral and axillary, glomerate, the pedicels 1–3 mm. long; sepals about 1 mm. long; petals obovate, somewhat longer than the sepals; fruit subglobose, 5–6 mm. in diameter, 1-seeded.

Wooded hills near Bayamon and Toa-baja;—Guiana and Brazil.

Davilla rugosa Poir, recorded by Grisebach from St. Thomas, is presumably an error in locality.

Dillenia indica L. [*D. speciosa* Thunb.], East Indian, seen as a fine large tree at the Agricultural Experiment Station, Mayaguez in 1923, becomes at least 20 m. high, with stout spreading branches, the oblong or lanceolate pubescent serrate leaves 15–25 cm. long, the large flowers axillary, 10–15 cm. in diameter, the large globose hard fruit pendulous.

Family 2. OCHNACEAE DC.

OCHNA FAMILY.

Trees, shrubs or herbs, mostly glabrous, often with glossy foliage, and bright yellow, orange, purplish or whitish flowers. Our genera with simple, alternate, coriaceous or membranaceous, entire or toothed, finely veined leaves. Stipules entire or pectinate-ciliate. Flowers solitary and axillary, or in terminal or axillary racemes or panicles. Sepals 5. Petals 5. Petaloid staminodia, when present, 5, distinct, opposite the petals and separated from them by a whorl of sterile filaments. Fertile stamens 5 or 10. Ovary 3-celled at the base, or 5–6 lobed, the lobes 1-celled. Fruit a capsule or drupe. About 17 genera and around 200 species, of wide distribution in the tropics.

Shrubs or small trees; stamens 10; fruit a drupe.
Herbs; fertile stamens 5; fruit a capsule.

1. *Ouratea*.
2. *Sauragesia*.

1. **OURATEA** Aubl. Pl. Guian. 1: 397. 1775.

Shrubs or trees, with simple alternate leaves and yellow flowers mostly in axillary or terminal panicles. Sepals 5. Petals 5, imbricated. Stamens 10, inserted at the base of the disk; filaments often very short; anthers opening by terminal pores. Ovary 5-6-lobed, the lobes 1-celled. Styles connate; stigma simple; ovules solitary in each cell, erect. Drupes 1-5, seated on the enlarged fleshy disk. Seed erect; embryo without endosperm. [Derived from the Caribbean name.] Over 100 species, natives mostly of tropical America; a few species in Asia and Africa. Type species: *Ouratea guianensis* Aubl.

1. **Ouratea littoralis** Urban, Symb. Ant. 1: 363. 1899.

A shrub or small tree, occasionally 6 m. tall. Leaves elliptic to ovate, 5-12 cm. long, 2-5.5 cm. broad, short-acuminate or occasionally obtuse at the apex, rounded or acute at the base, glabrous, remotely and rather indistinctly denticulate, or entire, short-petioled; panicles 5-10 cm. high; flowers fragrant; sepals ovate-oblong or elliptic, 5-6 mm. long, 3-3.5 mm. broad; petals fan-shaped, 7.5-10 mm. long, 8-9.5 mm. broad; anthers subsessile, 5 mm. long; drupes obovoid, 7-10 mm. long, 5-6.3 mm. in diameter. [*Gomphia nitida* of Stahl and of Eggers, not of Swartz.]

Sandy thickets along the coasts, eastern districts and about Laguna Tortuguero, Porto Rico, on the northern coastal plain; St. Thomas; Virgin Gorda. Endemic.

2. **SAUVAGESIA** L. Sp. Pl. 203. 1753.

Herbs, sometimes suffrutescent, with mostly small callus-margined leaves, the stipules pectinate-ciliate. Flowers rose-purple or violet, occasionally white, axillary or racemose. Sepals 5, subequal, appressed to the capsule. Petals 5, deciduous. External stamens sterile, separated from the 5 perfect stamens by 5 petaloid staminodia; anthers linear or oblong; the filaments short. Ovary 3-celled at the base; style simple; stigma obtuse. Capsule septicidally 3-valved. Seeds numerous, small; testa crustaceous; almost fleshy. [Commemorates François Boissier de Sauvage, 1706-1767, physician, and professor in Montpellier.] About a dozen species, natives mostly of the American tropics, the following typical.

1. **Sauvagesia erecta** L. Sp. Pl. 203. 1753.

Sauvagesia Adima Aubl. Pl. Guian. 1: 252. 1775.

Annual, the stems erect or reclining, often rather slender, 1.5-7 dm. or more long. Leaves elliptic-lanceolate, elliptic or oblong-ob lanceolate, 0.7-5.5 cm. long, 3-11 mm. broad, acute at the apex, narrowed at the base, serrulate, the petiole 1-4 mm. long; stipules lanceolate, 3-6 mm. long, conspicuously pectinate-ciliate; pedicels axillary, filiform; sepals lanceolate to ovate-lanceolate, 4.5-6 mm. long, acuminate and setiferous at the apex; petals obovate, 4.7-6.2 mm. long, 3-4 mm. broad; capsule a little longer than the sepals; seeds ellipsoid, 0.5-0.6 mm. long, deeply pitted.

Grassy banks in moist or wet districts, Porto Rico, ascending to higher elevations; Hispaniola; Saba to Trinidad; Margarita; continental tropical America. YERBA DE SAN MARTIN.

Family 3. **MARCRAVIACEAE** Choisy.**MARCRAVIA** FAMILY.

Epiphytic or climbing woody vines, with alternate entire leaves, dimorphous in the following genus, the perfect and regular flowers in terminal racemes or appearing umbellate, accompanied by characteristic hooded or galeate bracts. Sepals 4 or 5, imbricated. Petals 4 or 5, in the following genus connate into a deciduous calyptra. Stamens numerous. Fruit indehiscent or tardily dehiscent. About 6 genera and 40 species, natives of tropical America.

1. **MARCRAVIA** L. Sp. Pl. 503. 1753.

Epiphytic or saxicolous vines, the sterile branches creeping, attached to trees or rocks by numerous aerial roots and bearing small thin leaves, the flowering branches elongated, bearing coriaceous large, ovate to linear leaves and short racemes of pedicelled flowers, sometimes appearing umbellate, the several central saccate or galeate bracts usually short-stalked. Sepals 5, imbricated. Petals connate into a deciduous calyptra. Stamens commonly numerous; filaments slightly united at the base, free from the corolla; anthers basifixed, linear. Ovary several-celled; ovules several in each cell; style short or none. Fruit globose. Seeds many, small, oblong. [Commemorates George Marcgraf, German naturalist, born 1610.] About 20 species, of tropical America. Known as BEJUCO DE PALMA and BEJUCO DE RANA. Type species: *Marcgravia umbellata* L.

Inflorescence few-flowered; corolla about 15 mm. long; bracts cylindrical-clavate.

Inflorescence many-flowered; corolla about 8 mm. long; bracts galeate, flattened.

1. *M. rectiflora*.2. *M. Sintenisii*.1. **Marcgravia rectiflora** Tr. & Pl. Ann. Sci. Nat. IV. 17: 364. 1862.

M. rectiflora Jacquini Tr. & Pl. loc. cit. 366. 1862.

A vine, up to 12 m. long, or longer. Leaves of the flowering branches oblong or oblong-lanceolate, 6–12 cm. long, the apex acuminate, the base narrowed or obtuse, the petioles 2–4 mm. long; leaves of the creeping shoots oval to oblong, 2.5 cm. long or less; inflorescence few-flowered; pedicels stout, 4–6 cm. long, tuberculate; bracts cylindrical-clavate, stalked, about 2 cm. long; sepals rounded; corolla about 1.5 cm. long, about 3 times as long as the calyx; fruit globose, 1–1.5 cm. in diameter. [*M. umbellata* of Bello and of Stahl, not of Jacquini.]

On trees, rocks and cliffs, in moist or wet districts, Porto Rico, ascending to higher elevations; Tortola:—Cuba; Hispaniola; Dominica. PEGA PALMA.

2. **Marcgravia Sintenisii** Urban, Jahrb. Bot. Gart. Berlin 4: 245. 1886.

A vine, 6–10 m. long. Leaves of the flowering branches ovate-oblong to oblong-lanceolate, 5–11 cm. long, the apex acute or short-acuminate, the base obtuse or acute, the petioles 4–7 mm. long; leaves of the creeping shoots suborbicular or ovate, obtuse or rounded, 2 cm. long or less; inflorescence many-flowered; pedicels 1–3 cm. long, smooth or sparingly tuberculate; bracts galeate, compressed, short-stalked, about 1.5 cm. long; pedicels 1.5–3 cm. long, curved, deflexed; sepals semiorbicular, short and broad, about 4 mm. wide; corolla about 8 mm. long; fruit globose, about 1 cm. in diameter.

On trees in mountain forests, Porto Rico. Endemic.

Family 4. **THEACEAE** DC.

TEA FAMILY.

Trees or shrubs, with alternate simple, rarely opposite or subverticillate, pinnately veined leaves and regular, mostly perfect flowers. Sepals mostly 5, imbricated, the interior ones often larger than the exterior. Petals usually 5, hypogynous, distinct, or connate below. Disk none. Stamens mostly many, distinct, or adnate to the base of the corolla; anthers 2-celled. Ovary superior, 2-several-celled; styles distinct, or united, or none. Ovules pendulous or erect. Fruit capsular or indehiscent. Seeds with or without endosperm. About 16 genera, including some 180 species, mostly tropical and subtropical.

Fruit indehiscent.

Seeds 2-5 in each cell of the fruit, suspended.

Seeds numerous, on axile placentae.

Fruit a loculicidally dehiscent capsule.

1. *Taonabo*.

2. *Eroteum*.

3. *Haemocharis*.

1. **TAONABO** Aubl. Pl. Guian 1: 569. 1775.

Evergreen, mostly glabrous trees or shrubs, with alternate, opposite or subverticillate leaves, entire in our species, and axillary, mostly solitary, 2-bracteolate flowers on usually recurved peduncles. Sepals 5-7, imbricated. Petals mostly 5, connate below or to about the middle. Stamens many, adnate to the base of the corolla. Ovary mostly 2-celled; ovules few, pendulous; styles united, often short; stigmas 2-lobed or entire. Fruit coriaceous, indehiscent, few-seeded, usually beaked or pointed. Seeds with fleshy endosperm. [Guiana name.] Thirty or more species, of tropical America and Asia. Type species: *Taonabo dentata* Aubl.

Peduncles elongated, 2.5-9 cm. long.

Leaves obovate, about twice as long as wide.

Leaves oblong, about 3 times as long as wide.

Peduncles short, 12 mm. long or less.

Sepals 7, only 2-4 mm. long, eglandular.

Sepals 5.

Flowers subsessile; sepals eglandular, 3-5 mm. long.

Peduncles 5-12 mm. long; sepals glandular, 7-8 mm. long.

Leaves chartaceous; petals 8-9 mm. long; peduncles 8-12 mm. long.

Leaves coriaceous; petals about 6 mm. long; peduncles 5-8 mm. long.

1. *T. peduncularis*.

2. *T. luquillensis*.

3. *T. heptasepala*.

4. *T. subsessilis*.

5. *T. Stahlii*.

6. *T. pachyphylla*.

1. **Taonabo peduncularis** (DC.) Britton, Mem. Brooklyn Bot. Gard. 1: 70. 1918.

Ternstroemia peduncularis DC. Mem. Soc. Phys. Geneve 1: 409. 1822.

A tree, up to 10 m. high, usually smaller, sometimes shrubby. Leaves obovate to oblong-obovate, subcoriaceous, 4-7 cm. long, the apex rounded or obtuse, the base narrowed, the petioles 8 mm. long or less; peduncles slender, 2-7 cm. long; sepals 5, the outer ovate, glandular, 7-8 mm. long, the inner suborbicular, eglandular, about 9 mm. broad; petals 8-10 mm. long, the apex obtuse; fruit subglobose, pointed, about 12 mm. in diameter. [*T. elliptica* of West and of Eggers, not of Swartz.]

Coastal thickets near Fajardo; St. Croix; St. Jan.—St. Martin to Guadeloupe.

2. **Taonabo luquillensis** (Krug & Urban) Britton.

Ternstroemia luquillensis Krug & Urban, Bot. Jahrb. 21: 531. 1896.

A tree, up to 20 m. in height. Leaves oblong or elliptic-oblong, coriaceous, 6-12 cm. long, acute or acutish at both ends or the apex obtuse, the petioles stout,

6–12 mm. long; peduncles slender, 3–9 cm. long; sepals 5, suborbicular, eglandular, the inner about 1 cm. in diameter, somewhat larger than the outer; petals obcordate, about 12 mm. long.

Forests of the Sierra de Luquillo. Endemic. PALO COLORADO.

3. **Taonabo heptasepala** (Krug & Urban) Britton.

Ternstroemia heptasepala Krug & Urban, Bot. Jahrb. 21: 530. 1896.

A shrub, or a small tree up to 8 m. high. Leaves elliptic to obovate, coriaceous, 2.5–6 cm. long, the apex acute, obtuse or rounded, the base narrowed, the petioles 5 mm. long or less; peduncles curved, 10–18 mm. long; sepals 7, suborbicular, eglandular, the inner about 4 mm. broad, twice as large as the outer; petals obcordate, about 6 mm. long.

Summits of the higher mountains, Sierra de Luquillo. Endemic.

4. **Taonabo subsessilis** Britton, sp. nov.

A shrub, 1–2.5 m. high. Leaves obovate, coriaceous, 3–7 cm. long, revolute-margined, black-dotted beneath, the apex obtuse or rounded, the base narrowed, the stout petioles 4–6 mm. long; flowers nearly sessile; sepals 5, eglandular, suborbicular, the inner about 5 mm. long, the outer shorter; petals about 10 mm. long; fruit ovoid-conic, pointed, about 10 mm. long.

Summits of the higher mountains, Sierra de Luquillo. Type from the summit of El Yunque (*Britton and Bruner 7627*).

5. **Taonabo Stahlîi** (Krug & Urban) Britton.

Ternstroemia Stahlîi Krug & Urban, Bot. Jahrb. 21: 527. 1896.

A small tree, up to 5 m. high. Leaves obovate to elliptic, subcoriaceous, 5–9 cm. long, the apex rounded or obtuse, the base narrowed or subcuneate, the rather stout petioles 10 mm. long or shorter; peduncles 8–12 mm. long; sepals 5, the inner suborbicular, 7–9 mm. long, eglandular, the outer oval, glandular, somewhat shorter; petals oblong, obtuse, about as long as the inner sepals; fruit ovoid-conic, about 12 mm. long. [*Ternstroemia elliptica* of Stahl, not of Swartz.]

Sandy soil near Bayamon, and on Monte Mesa, Mayaguez, Porto Rico. Endemic. MAMEY DEL CURA.

6. **Taonabo pachyphylla** (Krug & Urban) Britton.

Ternstroemia pachyphylla Krug & Urban, Bot. Jahrb. 21: 529. 1896.

A tree, up to 8 m. high. Leaves obovate, thick-coriaceous, 4–7 cm. long, the apex rounded, the base narrowed, the stout petioles 4–7 mm. long; peduncles stout, 5–8 mm. long; sepals ovate, 7–9 mm. long, the inner obtuse, eglandular, the outer acutish, glandular; petals about 6 mm. long.

Mountain forests, Maricao, Porto Rico. Endemic.

Ternstroemia brevipes DC. was described from plants grown in the botanical gardens at Paris and at Berlin, doubtfully from Porto Rico; the species is not known from wild plants, and its geographical origin is uncertain; no plant conforming with descriptions and the published illustration (*Colla, Hart. Rip. pl. 38*) is known to us.

Ternstroemia verticillata Sessé & Moc., recorded as collected near Arecibo, has not been certainly identified. Urban suggested that it might be the same as *T. brevipes* DC. [Not *T. verticillata* Kl.]

2. **EROTEUM** Sw. Prodr. 85. 1788.

Trees or shrubs, the leaves mostly alternate and entire, the flowers axillary or lateral, on 1-flowered peduncles, fascicled or solitary, usually ebracteolate or the bractlets very small. Sepals 5, imbricated. Petals 5, distinct, or connate only at the base. Stamens many, adnate to the base of the corolla, the anthers usually pilose. Ovary 2-3-celled; ovules numerous on axile placentae; styles slender, united below; stigmas short. Fruit indehiscent. Seeds with fleshy endosperm. [Name not explained.] A few species of tropical and subtropical America and Asia. Type species: *Eroteum theoides* Sw.

1. **Eroteum albopunctatum** (Griseb.) Britton.

Ternstroemia albopunctata Griseb. Cat. Pl. Cub. 36. 1866.

Cleyera albopunctata Krug & Urban, Bot. Jahrb. 21: 537. 1896.

A tree, with maximum height of about 10 m. the twigs and leaves glabrous. Leaves elliptic or elliptic-obovate, coriaceous, entire, 5-10 cm. long, the apex rounded or obtuse, the base obtuse or narrowed, the stout petioles 5-10 mm. long; peduncles solitary or 2 together, 1-2 cm. long; sepals suborbicular, about 7 mm. broad, glabrous or ciliolate; petals cream-colored, orbicular-obovate, 12-14 mm. long, with a silky longitudinal band without; fruit subglobose, beaked, about 8 mm. in diameter.

Sierra de Luquillo, ascending to the summit of El Yunque, and in forests near Maricao, Porto Rico:—Cuba; Hispaniola. TETA PRIETA.

3. **HAEMOCHARIS** Salisb. Parad. Lond. sub. pl. 56. 1806.

Trees or shrubs, with chartaceous or subcoriaceous mostly alternate leaves, the flowers subsessile in the upper axils. Sepals 5, unequal. Petals 5, slightly coherent at the base, imbricated. Stamens many, the filaments more or less coherent below, or 5-adelphous. Ovary 5-10-celled; ovules several in each cell, pendulous; styles distinct or nearly so, short or wanting. Capsule angled or ridged, oblong or oval, loculicidally dehiscent. Seeds without endosperm. [Greek, blood-plant.] About 15 species, natives of tropical America and the East Indies. Types species: *Gordonia haematoxylon* Sw.

1. **Haemocharis portoricensis** Krug & Urban, Bot. Jahrb. 21: 548. 1896.

Wickstroemia portoricensis Blake, Contr. Gray Herb. 53: 40. 1918.

A tree, up to about 20 m. high, with a trunk sometimes 1 m. in diameter, the old bark fissured, the young twigs puberulent or glabrous. Leaves elliptic or obovate-elliptic, chartaceous, crenate, 5-12 cm. long, the apex obtuse, the base cuneate-attenuate, the petioles very short; flowers very nearly sessile; sepals puberulent, the larger ones about 12 mm. in diameter, suborbicular; petals obovate, cuneate, emarginate, bright white, fugacious, about 2 cm. long; ovary 6-10-celled; capsule oval, 6-10-ridged, 2-2.5 cm. long.

Forests of the eastern mountains of Porto Rico, at middle and higher elevations. Endemic. Elegant when in bloom, the white flowers conspicuous among the dark green leaves. MARICAO. NIÑO DE COTA.

Haemocharis haematoxylon (Sw.) Choisy, endemic in Jamaica, was listed by Krebs as found in St. Thomas prior to 1851; it may have been planted there. [*Gordonia haematoxylon* Sw.]

Family 5. **CLUSIACEAE** Lindl.**CLUSIA** FAMILY.

Shrubs or trees, mostly evergreen and glabrous, sometimes epiphytic, with resinous sap, opposite or verticillate, coriaceous estipulate entire leaves, the small or large, regular, polygamous, dioecious or rarely perfect flowers usually clustered, sometimes bracteolate. Sepals 2-6, rarely more, strongly imbricated. Petals usually as many as the sepals, sometimes more, hypogynous. Staminate flowers with numerous hypogynous stamens, the filaments united or distinct, with or without a rudimentary ovary. Pistillate flowers with a 2-several-celled ovary, and usually as many stigmas as there are ovary-cavities; staminodes or some perfect stamens usually present. Fruit baccate, drupaceous or capsular, usually fleshy. Seeds often arillate; endosperm none. About 25 genera and over 250 species, mostly tropical.

Fruit baccate or drupaceous, indehiscent.

Style well developed.

Fruit 2-4-celled.

Fruit 1-celled.

Style very short or none.

Fruit capsular, septicidally dehiscent, stigmas mostly sessile.

1. *Mammea*.
2. *Calophyllum*.
3. *Rhcedia*.
4. *Clusia*.

1. **MAMMEA** L. Sp. Pl. 512. 1753.

Evergreen trees, with thick rigid leaves, minutely many-veined and reticulated, the fragrant polygamous flowers axillary, peduncled, fascicled or solitary. Calyx closed in bud, splitting into 2 valvate sepals. Petals 4-6. Stamens many; filaments filiform, distinct; anthers longitudinally dehiscent. Ovary 2-4-celled, ovules 1 or 2 in each cavity; style short; stigma peltate, entire or 4-lobed. Fruit a large 2-4-seeded drupe. [From the aboriginal name.] A monotypic genus.

1. **Mammea americana** L. Sp. Pl. 512. 1753.

A tree, reaching a maximum height of about 25 m., with a trunk up to about 6 dm. in diameter, the twigs stout, glabrous. Leaves elliptic or elliptic-obovate, 8-16 cm. long, bright green, glabrous, the numerous slender veins close together, the apex rounded, the base obtuse or narrowed, the stout petioles 8-15 mm. long; peduncles solitary or few together, about as long as the petioles or somewhat longer, 1-flowered; flower-buds globose; calyx 8-10 mm. long; petals white, obovate, about twice as long as the sepals; drupe globose, russet, apiculate, 5-8 cm. in diameter.

Forests and hillsides in moist or wet districts of Porto Rico; St. Croix; St. Thomas; St. Jan; Tortola:—West Indies; continental tropical America. Commonly planted in Porto Rico and the Virgin Islands as in all tropical regions, for shade and for its edible fruit. The reddish brown, hard and durable wood has a specific gravity of about 0.9, and is used in construction. MAMEY. MAMMEE APPLE.

2. **CALOPHYLLUM** L. Sp. Pl. 514. 1753.

Trees, with short-petioled, coriaceous, pinnately striate-veined leaves, and lateral, axillary or terminal, polygamous flowers in racemes or panicles. Sepals 2-4; petals 1-4, or wanting. Stamens many, distinct, or their bases united; filaments short; anthers ovate or oblong. Ovary 1-celled; style long or short, the stigma peltate; ovule 1, erect. Fruit a drupe. [Greek, beautiful-leaved.] About 25 species, mostly of tropical Asia, a few in tropical America. Type species: *Calophyllum Calaba* L.

1. *Calophyllum antillanum* Britton.

Calophyllum Calaba Jacq. Sel. Amer. 269. 1763. Not L. 1753.

A tree, becoming at least 30 m. high, often branched nearly to the base, the old bark with deep broad fissures. Leaves elliptic or oblong-elliptic, 7–15 cm. long, glabrous, dark green, rounded or slightly emarginate at the apex, narrowed or obtuse at the base, shining, the midvein rather prominent, the lateral veins very numerous and close together; racemes lateral or axillary, few-flowered, much shorter than the leaves; pedicels rather stout, 4–10 mm. long; flowers white, fragrant, the few petals about twice as long as the orbicular sepals, or petals wanting; staminate flowers with about 50 stamens; pistillate flower with a short style, a globose ovary and many staminodes; drupe nearly 2.5 cm. in diameter, the endocarp crustaceous.

Woodlands, forests and river-banks at lower and middle elevations, Porto Rico, mostly in wet or moist districts; Vieques; St. Croix; St. Thomas.—West Indies (except Bahamas); naturalized in Bermuda. Commonly planted for shade and ornament. The hard, nearly white, durable wood, with a specific gravity of about 0.7 is valued for construction and for posts. MARIA. PALO DE MARIA. GALBA. CALABA. SANTA MARIA.

3. *RHEEDIA* L. Sp. Pl. 1193. 1753.

Evergreen glabrous trees or shrubs, with yellow sap, rigid coriaceous, often spine-tipped leaves, the axillary peduncled flowers fascicled or solitary, polygamous or dioecious. Sepals 2. Petals 4, imbricated. Staminate flowers with several or many stamens, the filaments distinct. Pistillate flowers with a few staminodes and a 3–5-celled ovary, the style very short or none, the stigma peltate; ovules 1 in each cavity. Fruit a 1–5-seeded berry. [Commemorates Henri von Rheede, 1635–1691, famous Dutch botanist.] About 20 species, of tropical distribution, mostly American. Type species: *Rheedia lateriflora* L.

Leaves elliptic to obovate-elliptic, 5–9 cm. long.

1. *R. acuminata*.

Leaves narrowly lanceolate, 1.5–2.5 cm. long.

2. *R. Hessii*.

1. *Rheedia acuminata* (Spreng.) Tr. & Pl. Ann. Sci. Nat. IV. 14: 239. 1860.

Clusia acuminata Spreng. Syst. 2: 599. 1825.

Quapoya acuminata Walp. Rep. 1: 393. 1842.

Marialva elliptica Stahl, Estud. 2: 126. 1884.

Rheedia portoricensis Urban, Symb. Ant. 1: 368. 1899.

A tree, up to 20 m. high, or sometimes shrubby, the twigs angled and flattened. Leaves elliptic to elliptic-obovate, 5–9 cm. long, the apex sharply acute and aristate, the base narrowed, the lateral venation spreading, the petioles 5–10 mm. long; peduncles about as long as the petioles or longer; sepals broad, 3–4 mm. long; petals suborbicular, pink, 6–7 mm. long; staminate flowers with about 18 stamens; pistillate flowers with fewer stamens; berry obovoid or ellipsoid, 2.5–3.5 cm. long. [*Rheedia aristata* of Grisebach, in part; *Toovomita elliptica* of Cook and Collins, not of Engler.]

Coastal thickets, eastern districts, northern coastal plain, on wooded hills and ravines near Coamo, and along Río Icaico, Sierra de Naguabo, Porto Rico; Vieques. Endemic. The tree of the Naguabo Mountains may be specifically distinct from that of the northern coastal plain. GUAYABACOA. SEBUCAN.

2. *Rheedia Hessii* Britton, Bull. Torr. Club 42: 390. 1915.

Young branches angled, slender, the older ones terete. Leaves opposite, coriaceous, clustered on short lateral twigs, narrowly lanceolate, 1.5–2.5 cm. long, 6 mm. wide or less, narrowed at the base into stout petioles 2–3 mm. long, spinulose-acuminate at the apex, the midvein prominent beneath, very indistinct above, the lateral venation wholly obscure, the margins thickened; staminate

flowers solitary in upper axils on pedicels about 4 mm. long; sepals suborbicular, about 3 mm. broad; petals obovate-elliptic, rounded at the apex, 5 mm. long; stamens numerous, the stout filaments 2-2.5 mm. long; anthers less than 0.5 mm. broad.

Indiera Frla near Maricao, Porto Rico. Endemic.

Rheedia madruno (H. B. K.) Tr. & Pl., Colombian, introduced at the Insular Experiment Station, Rio Piedras, Porto Rico, through the Bureau of Plant Industry in 1923, had reached a height of 6 dm. in February, 1924, making vigorous growth.

4. **CLUSIA** L. Sp. Pl. 509. 1753.

Evergreen trees or shrubs with resinous sap, usually glabrous throughout, often epiphytic or half-climbing on other trees and sometimes strangling them, the leaves opposite, entire, mostly closely many-veined, the usually polygamous flowers solitary or cymose. Sepals 4-16, imbricated. Petals 4-9, also imbricated. Stamens many in the staminate flowers, fewer in the pistillate ones; anthers linear. Pistillate flowers with several or many staminodes; ovary 4-12-celled; stigmas sessile, radiating; ovules many in each cavity. Capsule leathery or fleshy, at length dehiscent. Seeds arillate, the embryo small, the cotyledons plano-convex. [Commemorates Charles de l'Ecluse, a French botanist of the sixteenth century.] About 80 species, of tropical and subtropical America, known as CUPEY or CUPEILLO. Type species: *Clusia major* L.

Fruit small, 2.5 cm. long or less; stigmas 5-7; inflorescence few-many-flowered; flowers small.

Leaves thick and rigid; petioles very short, stout.

Leaves chartaceous, fleshy, scarcely rigid; petioles rather slender.

Fruit oblong; inflorescence many-flowered.

Fruit subglobose or obovoid; inflorescence few-flowered.

Fruit large, globose, 5-8 cm. in diameter; stigmas 7-9; flowers solitary or 2 together, large.

1. *C. Krugiana*.

2. *C. Gundlachii*.

3. *C. minor*.

4. *C. rosea*.

1. **Clusia Krugiana** Urban, Symb. Ant. 1: 367. 1899.

A tree, up to 15 m. high, the twigs stout, slightly angled. Leaves obovate, thick, rigid, shining, 5-11 cm. long, the apex rounded, the base narrowed, the stout petioles 1-4 mm. long; inflorescence terminal, peduncled, several-many-flowered, 5-6 cm. long; peduncle 1.5-4 cm. long; sepals 4, ovate, about 4 mm. long; petals yellow, about 10 mm. long; stigmas 5; fruit globose, about 1.5 cm. in diameter.

Mountain forests of Porto Rico, ascending to the summit of Monte El Yunque. Endemic.

2. **Clusia Gundlachii** Stahl, Estud. 2: 122. 1884.

Clusia calyptrata Vesque, Epharm. 3: 8. 1892.

A vine-like shrub, with long slender subterete branches, recorded as sometimes forming a tree. Leaves obovate to oblong-oblancoate, 6-12 cm. long, chartaceous, somewhat fleshy, the apex acute, acuminate or obtuse, the base cuneate, the rather slender petioles 5-15 mm. long; inflorescence terminal, short-peduncled, 6 cm. long or less, many-flowered; sepals 4, about 3 mm. long; petals few, small; stigmas 5; fruit oblong, 1.5-2 cm. long.

Forests, hillsides and thickets in wet or moist districts, Porto Rico, ascending to higher elevations. Endemic.

3. **Clusia minor** L. Sp. Pl. 510. 1753.

Clusia cartilaginea Vesque in DC. Mon. Phan. 8: 97. 1893.

A shrub, or a tree up to about 10 m. high, the branches slender, or vine-like, the twigs slightly angled. Leaves obovate, cartilaginous, 10 cm. long or less,

the apex obtuse or rounded, the base cuneate, the slender petioles 10–20 mm. long; inflorescence few-flowered; sepals 4, 6–7 mm. broad; petals 4 or 5, broadly ovate, white or pink, 10–12 mm. long; fruit subglobose or obovoid, 1.5–2 cm. long. [*C. venosa* Linnaeus, not Jacquin; *C. acuminata* of Bello, not of Sprengel.]

Forests and river-banks at middle elevations, Porto Rico; erroneously recorded from St. Thomas:—Cuba; Hispaniola; Dominica to Trinidad; continental tropical America.

4. ***Clusia rosea* Jacq. Enum. 34. 1760.**

A tree, attaining a maximum height of about 20 m., the bark smooth, the roots warty. Leaves obovate, glabrous, thick, coriaceous, rigid, 10–15 cm. long, 7–12 cm. wide above the middle, closely pinnately many-veined, rounded at the apex, cuneate at the base, the stout petioles about 1 cm. long; flowers solitary or sometimes 2 together, short-peduncled; sepals 6, rounded, 1–1.5 cm. broad; petals white or rose, broadly obovate or nearly orbicular, 3–4 cm. long, broadly cuneate at the base; stigmas 7–9; fruit globose, nearly white, 5–8 cm. in diameter. [? *C. alba* of West and of Krebs; *C. rubra* of Krebs.]

Hillsides, woods and river-banks, Porto Rico, mostly at lower elevations; Mona; Desecho; Vieques; Culebra; St. Croix (according to West and to Eggers); St. Thomas; St. Jan; Tortola:—West Indies; continental tropical America. The reddish brown wood is hard and durable, with specific gravity of about 0.8. PITCH-APPLE. WILD MAMMEE. BALSAM FIG.

Species of the Old World genus *Garcinia* have been planted in Porto Rico in the endeavor to establish there the Mangosteen, ***G. Mangostana* L.**, valuable for its delicious fruit. Among these are the following:—

***Garcinia celebica* L.**, East Indian, grown by Mr. Harold I. Sewell at Naguabo, Porto Rico, attaining a height of about 4 meters in 6 year's growth, has yellow stout twigs, elliptic leaves about 9 cm. long, narrowed at both ends.

***Garcinia Benthami* Pierre**, of Cochin China, also grown by Mr. Sewell at Naguabo, reaching a height of about 7 meters in 10 year's growth, has brownish slender twigs, oblong leaves about 7 cm. long, the apex acuminate, the base narrowed.

***Garcinia Livingstonii* T. Anders.**, of tropical Africa, and ***G. spicata* Hook. f.**, Malayan, were experimentally planted at the Insular Experiment Station, Rio Piedras, in 1924.

Family 6. **HYPERICACEAE Lindl.**

ST. JOHN'S-WORT FAMILY.

Herbs or shrubs, sometimes small trees in tropical regions, with opposite, or rarely verticillate, simple entire or rarely glandular-ciliate or dentate stipulate leaves, and solitary or cymose-paniculate flowers. Foliage pellucid-punctate or black-dotted. Flowers regular and perfect. Sepals 5 or 4, imbricated. Petals of the same number, hypogynous, generally oblique or contorted. Stamens ∞ , hypogynous, often in sets of 3 or 5; anthers versatile or innate, 2-celled, longitudinally dehiscent. Ovary 1–7-celled, composed of 1–7 carpels; styles as many as the carpels; ovules in 2 rows in each cavity, anatropous. Fruit mainly capsular with septicial dehiscence; seeds mainly straight; endosperm none. About 10 genera and more than 300 species, mainly of temperate and warm regions.

Sepals 4, in unequal pairs; petals 4.
Sepals and petals 5.

1. *Ascyrum*.
2. *Hypericum*.

1. **ASCYRUM** L. Sp. Pl. 787. 1753.

Leafy glabrous low shrubs, with small narrow entire black-punctate leaves, the flowers bright yellow. Sepals 4, in 2 pairs, the exterior ones broad and round, the interior smaller and narrower. Petals 4, oblique or slightly contorted, deciduous. Stamens ∞ , distinct, or united in clusters. Ovary 1-celled, with 2-4 parietal placentae; styles 2-4. Capsule 1-celled, 2-4-valved, dehiscent at the placentae. [Greek, not rough.] About 6 species, natives of eastern North America, Central America and the West Indies. Type species: *Ascyrum hypericoides* L.

1. **Ascyrum hypericoides** L. Sp. Pl. 788. 1753.

Ascyrum Crux-Andraee L. Sp. Pl. ed. 2, 1107. 1763.

A slender much-branched shrub, 1-8 dm. tall, with erect, ascending or decumbent stems. Leaves oblanceolate, obovate-oblong, or oblong, 1-3 cm. long, obtuse, acutish or sometimes minutely mucronate at the apex, narrowed and 2-glandular at the base; sepals very unequal, the outer ovate or ovate-oblong, 6-10 mm. long, obtuse or acute at the apex, truncate or subcordate at the base, the inner decidedly smaller; capsule narrowly ovoid or ellipsoid, about as long as the outer sepals or shorter.

Sandy soil at lower and middle elevations, Porto Rico:—Cuba; Jamaica; Hispaniola; southern and eastern United States; Mexico. ARAYANILLA. ST. ANDREW'S CROSS.

2. **HYPERICUM** L. [Tourn.] L. Sp. Pl. 783. 1753.

Herbs or shrubs, with opposite punctate or black-dotted leaves, and mostly cymose, rarely solitary, yellow flowers. Sepals 5, equal or nearly so. Petals 5, mainly oblique or contorted, convolute or imbricated in the bud. Stamens ∞ distinct, or more or less united in clusters, sometimes with interposed hypogynous glands. Ovary 1-celled, with 3-5 parietal placentae which sometimes project far into the cavity, or 3-5-celled (rarely 6-celled); ovules ∞ , generally numerous; styles 3-6. Capsule 1-5-celled (rarely 6-celled). [The Greek name.] About 210 species, of wide geographic distribution. Type species: *Hypericum perforatum* L.

1. **Hypericum diosmoides** Griseb. Cat. Pl. Cub. 40. 1866.

Hypericum portoricense Kuntze, Rev. Gen. Pl. 60. 1891.

A low, densely leafy herb, the slender elongated branches decumbent or ascending, glabrous or nearly so. Leaves oblong-oblanceolate, oblanceolate, or narrowly oblong, 2.5-7 mm. long, 0.6-1.5 mm. broad, obtuse or acutish at the apex, narrowed at the base, connate; sepals oblong or oblong-obovate, 2.5-3 mm. long, acute or obtuse; corolla about 5.5 or 6 mm. wide, yellow; capsule ellipsoid, 2-2.5 mm. long, 1.5-1.7 mm. thick; seeds oblong-ellipsoid, 0.5 mm. long, brown.

Moist grassy places at middle and higher elevations, Porto Rico:—Cuba; Hispaniola.

Tamarix indica Willd., TAMARISK, Asiatic, of the Family **Tamariscaceae**, occasionally planted for ornament in the Virgin Islands, is a shrub or small tree with very slender branches densely clothed with minute scale-like imbricated leaves, the small white flowers in many dense spikes, with usually 5 sepals, 5 petals, 10 stamens and 5 sessile stigmas.

Tamarix articulata Vahl, Arabian, was experimentally grown at the St. Croix Agricultural Experiment Station, from seeds received from Washington.

Hudsonia tomentosa Nutt., of the Family **Cistaceae**, native of sandy beaches in the northeastern United States, is recorded by Krebs as found on those of St. Thomas, but this must be an error in determination as the plant ranges southward only to North Carolina.

Family 7. **BIXACEAE** Rehb.

ANNATTO FAMILY.

Shrubs or small trees. Leaves simple, toothed, lobed or entire. Flowers perfect. Calyx of 4 or 5 sepals. Corolla of as many petals as the sepals, deciduous. Stamens numerous. Ovary superior, 1-celled, with 2-several parietal placentae which are sometimes well intruded. Styles as many as the placentae, but united. Ovules several on each placenta. Fruit a capsule. Seeds numerous, sometimes hairy. Four genera and about 20 species, of tropical regions.

1. **BIXA** L. Sp. Pl. 512. 1753.

Flowers borne in terminal panicles. Sepals 5, imbricate, deciduous. Petals 5, contorted in bud. Anthers opening by 2 terminal pores. Ovary 1-celled; style slender, the stigma notched. Capsule loculicidally 2-valved. Seeds numerous; testa pulpy; albumen fleshy; cotyledons flat. One species, widely cultivated in all tropical and subtropical regions. [Derived from the South American name.]

1. **Bixa Orellana** L. Sp. Pl. 512. 1753.

A shrub, or small tree sometimes 9 m. tall, with dark brown, usually scaly twigs. Leaves ovate, 8–20 cm. long, 4–15 cm. broad, occasionally larger, acuminate at the apex, cordate or truncate at the base, entire, often more or less scaly on both sides when young, glabrous in age, long-petioled; flowers 4–5.3 cm. in diameter, sepals broadly oval to suborbicular, the petals pinkish or white, obovate to broadly oval, 2.4–2.8 cm. long, 0.8–1.8 cm. broad, rounded at the apex; capsule ovoid to globose-ovoid, 3–4 cm. long, 3–4.5 cm. in diameter, usually densely clothed with long slender soft prickles; seeds obpyramidal, about 5–5.5 mm. long, 4–5 mm. broad.

Woods and hillsides at lower elevations, Porto Rico; much planted for the dye-stuff annatto, and often spontaneous after planting; Vieques; St. Croix; St. Thomas;—Jamaica; Cuba; Hispaniola; Saba to Trinidad; Margarita; continental tropical America; naturalized in tropical regions of the Old World. Its yellowish white wood is weak, light and soft. **ACHOTE. ANNATTO.**

Maximiliana vitifolia (Willd.) Krug & Urban, planted for ornament in Porto Rico and the Virgin Islands, native of continental tropical America, is a tree with palmately-lobed leaves, the showy yellow flowers sometimes 11 cm. or more in diameter, the numerous seeds clothed with a silky down. It is placed in the related family **Cochlospermaceae**. [*Bombax vitifolium* Willd.; *Cochlospermum vitifolium* Spreng.]

Family 8. **CANELLACEAE** Mart.

CANELIA FAMILY.

Aromatic trees or shrubs, with alternate pinnately veined, coriaceous or subcoriaceous, entire estipulate petioled leaves, and solitary or corymbose perfect flowers. Sepals 3, distinct, imbricated. Petals 4–12, or wanting.

Stamens many, the filaments united into a tube, the anthers extrorse. Ovary superior, 1-celled, with 2-6 parietal placentae; ovules 2-several, nearly anatropous; style united; stigma 2-6-lobed. Fruit baccate. Seeds with a smooth crustaceous testa; embryo subcylindric, in copious fleshy endosperm. Five genera and seven known species, of tropical America and Africa.

Petals 5, in 1 row; flowers corymbose, terminal.
 Petals 12, in 4 rows of 3 each; flowers axillary, solitary.

1. *Canella*.
2. *Pleodendron*.

1. **CANELLA** P. Br. Hist. Jam. 275. 1756.

An evergreen tree, glabrous throughout, with coriaceous leaves and terminal bracteolate corymbs of purple, red or violet flowers, the bark and leaves pleasantly aromatic. Petals 5. Stamens 10-20, the filament-tube not appendaged by scales, the anthers contiguous, longitudinally dehiscent. Ovary with 2 or 3 parietal placentae each bearing 2 ovules; style short; stigma 2-3-lobed. Berry globose, its gelatinous pulp enclosing few, obovoid to orbicular seeds. [Latin, cinnamon.] A monotypic genus.

1. **Canella Winterana** (L.) Gaertn. Fr. & Sem. 1: 373. 1788.

Laurus Winterana L. Sp. Pl. 371. 1753.
Winterana Canella L. Syst. ed. 10, 1045. 1759.
Canella alba Murray, Syst. Veg. 443. 1784.

A tree, up to 15 m. high, usually much smaller, sometimes shrubby, the trunk up to 2.5 dm. thick, the bark gray, aromatic. Leaves oblanceolate or spatulate, 3-10 cm. long, dark green and somewhat shining above, rather dull beneath, rounded or obtuse at the apex, not prominently veined, the slender petioles about 1 cm. long; corymbs few-several-flowered; pedicels slender; sepals reniform-orbicular, thick, about 3 mm. long, ciliolate; petals obovate, obtuse, nearly twice as long as the sepals; stamen-tube 3-4 mm. long; anthers yellow; berry crimson or nearly black, about 1 cm. in diameter; seeds black.

Thickets, woods, hillsides and arroyos, southern and southwestern dry districts at lower elevations, and at Cabeza de San Juan, Porto Rico; Mona; Icacos; Vieques; St. Croix; St. Thomas; St. Jan; Anegada;—Florida; West Indies, south to Barbados. The hard heavy reddish brown wood has a specific gravity of nearly 1.00; the bark yields a condiment and is used medicinally as a tonic. BARBASCO. WILD CINNAMON. WHITE WOOD BARK. CANELLA. PEPPER CINNAMON. WINTER BARK.

2. **PLEODENDRON** van Tieghem, Journ. de Bot. 13: 272. 1899.

Evergreen trees, with simple alternate leaves. Flowers solitary, axillary. Sepals 3. Petals 12, in 4 rows of 3 each. Stamens many, united. Ovary with 6 parietal placentae, each bearing numerous ovules; stigmas 6. [Commemorates F. Plée, who first collected specimens of this tree in Porto Rico.] A monotypic genus.

1. **Pleodendron macranthum** (Baill.) van Tieghem, Journ. de Bot. 13: 272. 1899.

Cinnamodendron macranthum Baill. Bull. Soc. Linn. Paris 1: 317. 1882.

A tree, 10 m. or more high, with brownish twigs. Leaves broadly elliptic, 9-13 cm. long, 5-6 cm. broad, obtusely short-acuminate at the apex, acute at the base, green and glabrous on both sides, the primary veins rather numerous, slender, the midvein impressed above, prominent beneath; petioles 7-9 mm. long; fruiting peduncles 1.5-2.5 cm. long; calyx persistent, somewhat reflexed; fruit obovoid-globose, 2-2.5 cm. in diameter, apiculate with a short persistent

style, green, edible; seeds numerous, subreniform-cordate, 3.5 mm. long, 2.5 mm. broad, brownish black.

Forests, Sierra de Luquillo. Endemic. Its wood is hard, heavy, nearly white. CHUPA GALLO.

Family 9. **FLACOURTIACEAE** Lindl.

FLACOURTIA FAMILY.

Trees or shrubs, with alternate simple usually dentate leaves, the stipules minute or wanting, the small regular flowers usually clustered, perfect, dioecious or polygamous. Calyx 3-7-lobed or of 3-7 distinct sepals. Petals as many as the calyx-lobes or sepals, or rarely more, or wanting. Stamens few or numerous, in some genera alternating with staminodia; filaments distinct or connate; anthers 2-celled. Ovary superior, 1-celled; ovules few or numerous, on parietal placentae. Fruit capsular or baccate. About 70 genera, including over 500 species, of tropical regions.

Flowers petaliferous.

Stamens numerous, in several series.

Ovary 3-5-celled.

Ovary 1-celled.

Stamens in fascicles opposite the petals.

Flowers apetalous.

Stamens hypogynous; leaves not punctate.

Stamens perigynous; leaves often punctate.

Stamens not alternate with scales or staminodia.

Stamens alternate with scales or staminodia.

1. *Prockia*.

2. *Banara*.

3. *Homalium*.

4. *Myroxylon*.

5. *Samyda*.

6. *Casearia*.

1. **PROCKIA** P. Br.; L. Syst. ed. 10, 1074. 1759.

Trees or shrubs, with membranous ovate petioled serrate leaves, palmately nerved from the base, epunctate, the few, mostly complete flowers long-pedicelled in terminal racemes or corymbs. Sepals 3 or 4, valvate, persistent. Petals short, as many as the sepals or fewer. Stamens many, distinct, borne on a small disk; anthers globose. Ovary 3-5-celled; ovules many; style subulate. Fruit a many-seeded berry, the crustaceous seeds with fleshy endosperm. [In honor of Christian Lebrecht, baron of Prock, governor of St. Croix.] A few species of tropical America, the following typical.

1. **Prockia crucis** L. Syst. ed. 10, 1074. 1759.

Trilax crucis Griseb. Goett. Abh. 7: 165. 1857.

A shrub or a small tree, recorded as sometimes reaching a height of 10 m., the slender twigs glabrous or pubescent. Leaves broadly ovate, acuminate, cordate, 3-12 cm. long, glabrous or pubescent, the slender petioles 2 cm. long or shorter; racemes or corymbs as long as the leaves or shorter; flowers odorous; pedicels 1-3 cm. long; sepals ovate or ovate-lanceolate, about 5 mm. long, puberulent; petals yellowish; fruit globose, black, 6-9 mm. in diameter.

Woodlands and hills near Aguirre and Cayey, Porto Rico; St. Croix; St. Thomas; St. Jan (according to Eggers):—Cuba; Hispaniola; Saba to Tobago; tropical South America.

2. **BANARA** Aubl. Pl. Guian. 1: 547. 1775.

Shrubs or trees with alternate petioled, somewhat inequilateral, usually glandular-dentate and punctate leaves, small stipules, and small perfect flowers in racemes, corymbs or panicles. Calyx persistent, 3-5-lobed, the lobes valvate.

Petals as many as the calyx-lobes, and similar to them, persistent, imbricated. Stamens many, with filiform filaments; staminodia none. Ovary superior, 1-celled or by intrusion of the placentae nearly several-celled; ovules many; style slender; stigma capitate. Fruit a fleshy or leathery, indehiscent, many-seeded berry. Seed striate, the endosperm fleshy. [Guiana name.] About 15 species, natives of tropical America. Type species: *Banara guianensis* Aubl.

Racemes 5-10-flowered; calyx-lobes and petals glabrous on the back. 1. *B. portoricensis*. Flowers solitary at the ends of the branches; calyx-lobes and petals tomentose on both sides. 2. *B. Vanderbiltii*.

1. **Banara portoricensis** Krug & Urban; Urban Symb. Ant. 1: 370. 1899.

A shrub, or tree sometimes 8 m. tall, with glabrous branches. Leaves lanceolate to ovate or oval, 5-12.5 cm. long, 2-6.5 cm. broad, acuminate at the apex, acutish or rounded at the base, reticulate-veined and smooth above, glabrous or with scattered appressed hairs on the midvein beneath, serrate; petioles 6-12 mm. long; inflorescence racemose, 5-10-flowered; pedicels long, slender; calyx-lobes 3, ovate, 5 mm. long, glabrous on the back; petals 3, a little larger than the sepals, ovate-orbicular, glabrous on the back; fruit subglobose, 6.5 mm. long, 7-7.5 mm. in diameter; seeds ovate, 1.2-1.5 mm. long, shining.

Mountain forests, Cordillera Central, Porto Rico. Endemic. PALO DE RAMON.

2. **Banara Vanderbiltii** Urban, Symb. Ant. 3: 320. 1902.

A shrub, 3 m. or more tall, the twigs and branches more or less pubescent with spreading hairs. Leaves elliptic-oblong, lanceolate or broadly elliptic, 4.5-12 cm. long, 2-5 cm. broad, acuminate at the apex, obtuse or rounded at the base, reticulate-veined and softly pubescent on both sides, ultimately scabrous above, sinuate-dentate; petioles 4-7 mm. long; flowers solitary at the ends of the branches; peduncles 13-18 mm. long, tomentose; calyx-lobes 3, triangular, triangular-ovate, or rhombic-lanceolate, 5-6 mm. long, 3-4 mm. broad, tomentose on both sides; petals 3, ovate, 6-7 mm. long, 3.5-5 mm. broad, tomentose on both sides; ovary globose-ovoid, glabrous, the style 6-7 mm. long.

Border of woods near Cataño and Martín Peña, Porto Rico. Endemic.

3. **HOMALIUM** Jacq. Enum. 5, 24. 1788.

Trees or shrubs, with pinnately veined leaves and small petaliferous flowers in axillary panicles or racemes. Calyx-tube short, the 5-7 segments persistent. Petals 5-7, borne at the mouth of the calyx-tube. Stamens in fascicles of 2-8 opposite the petals, alternating with glands; filaments filiform; anthers small. Ovary half-superior; styles 2-5, filiform; stigmas small. Capsule few-seeded, 2-5-valved above. [Greek, equal, referring to the equal stamen-clusters.] About 30 species, natives of tropical regions, known as TOSTADO in Porto Rico. Type species: *Homalium racemosum* Jacq.

Styles distinct to the base; ovary villous.
 Styles united at the base into a short column.
 Ovary densely villous.
 Ovary glabrous, or with a very few short hairs.

1. *H. racemosum*.
 2. *H. pleiandrum*.
 3. *H. leiogynum*.

1. **Homalium racemosum** Jacq. Enum. 24. 1760.

Homalium racemosum barbellatum Blake, Contr. U. S. Nat. Herb. 20: 229. 1919.

A tree, reaching a maximum height of over 10 m., usually smaller, often shrubby, the slender twigs glabrous. Leaves elliptic to ovate, short-petioled,

5–12 cm. long, crenate-dentate, chartaceous, reticulate-veined, glabrous, or barbellate in the axils of the veins beneath, the apex acute or short-acuminate, the base narrowed, obtuse or rounded; panicles narrow, glabrous, loosely or densely many-flowered, often longer than the leaves; pedicels 1–4 mm. long; calyx puberulent, its 5–7 segments ovate to ovate-lanceolate, about 3 mm. long; petals 5–7, puberulent on both sides, ovate, about 5 mm. long; stamens in fascicles of 3 or 4; styles 3, distinct to the base; ovary conic, densely pilose.

Wooded hills and forests at lower and middle elevations in moist and dry districts, Porto Rico:—Jamaica; Cuba; Hispaniola; Antigua; Guadeloupe; Martinique. The wood is strong, heavy and hard; it is used in construction.

2. **Homalium pleiandrum** Blake, Contr. U. S. Nat. Herb. 20: 227. 1919.

Homalium brevistylum Blake, loc. cit. 228. 1919.

A tree, 5–6 m. high or higher, or often shrubby, similar to *H. racemosum*, but the young twigs sometimes puberulent, the leaves glabrous, or puberulent beneath in the axils of the veins, sometimes obtuse; flowers like those of *H. racemosum* but the stamens sometimes as many as 8 in the fascicles; ovary pilose or villous; styles 2–4, united below into a short column.

Wooded hills and forests, Porto Rico, at lower and middle elevations in wet or moist districts, ascending to 900 m. altitude. Endemic. *H. pleiandrum* and *H. brevistylum* do not appear to us to be specifically distinct from each other; whether either of them is distinct from *H. racemosum* by the character of partly united styles, requires further investigation.

3. **Homalium leiogynum** Blake, Contr. U. S. Nat. Herb. 20: 228. 1919.

Twigs slender, glabrous. Leaves oblong to elliptic, subchartaceous, 6–9.5 cm. long, undulate-crenate, short-petioled, reticulate-veined, glabrous above, barbellate in the axils of the veins beneath, the apex acute or short-acuminate, the base obtuse or narrowed; flowers racemose; racemes puberulent, several-flowered, rather shorter than the leaves; pedicels 1.5–2.5 mm. long; calyx narrowed below, its 5–7 segments, ovate to ovate-lanceolate, puberulent, 3–4 mm. long; petals about 4.5 mm. long; stamens in fascicles of 4–6; styles 3 or 4, glabrous, united into a short column at the base; ovary glabrous or bearing very few long hairs.

In dry woods, Fajardo, Porto Rico, collected only by Heller. Endemic. Apparently distinct from related species by its nearly glabrous ovary, somewhat different foliage, and racemose inflorescence.

4. **MYROXYLON** Forst. Char. Gen. 126. 1776.

Shrubs or trees, often spiny, with usually toothed, sometimes spinulose-dentate leaves and small, dioecious or polygamous flowers, fasciated or short-racemose in the axils. Sepals 4 or 5, imbricated. Petals wanting. Stamens several or numerous, borne on a glandular disk, the anthers versatile. Ovary with 2–6 parietal placentae; ovules few or several; style simple or cleft, sometimes very short; stigmas dilated, rarely lobed. Fruit a small, 2–several-seeded berry, the seeds obovoid. [Greek, balsam-wood.] About 30 species, tropical and subtropical in distribution. Type species: *Myroxylon suaveolens* Forst.

Leaves reticulate-veined on both sides, 5–11.5 cm. long.

Leaves not reticulate-veined beneath.

Styles 3; leaves ovate, 6–8 cm. long.

Styles or stigmas 2; leaves oblong-obovate to oval, 1.5–5 cm. long.

1. *M. Schwaneckeanum*.

2. *M. pachyphyllum*.

3. *M. buxifolium*.

1. **Myroxylon Schwaneckeanum** Krug & Urban, Bot. Jahrb. 15: 296. 1892.

Xylosma Schwaneckeanum Urban, Symb. Ant. 1: 371. 1899.

A shrub or small tree, with slender brown twigs. Leaves oblong-ovate to ovate, 5–11.5 cm. long, 3–5.5 cm. broad, acuminate at the apex, rounded or obtuse,

and often slightly cordate at the base, remotely serrate above the base, coriaceous, lustrous above, paler beneath, the lateral venation prominent on both sides; petioles 3-4 mm. long; flowers polygamous; sepals suborbicular, 3 mm. long; stamens in the staminate flowers 40-70, fewer in the perfect flowers, the filaments about 2 mm. long; styles short, thick, spreading; fruit ovoid, 12-14 mm. long, 8 mm. in diameter.

Forests, Sierra de Luquillo. Endemic. PALO DE CANDELA. PALO COLORADO.

2. **Myroxylon pachyphyllum** Krug & Urban, Bot. Jahrb. 15: 297. 1892.

Xylosma pachyphyllum Urban, Symb. Ant. 1: 371. 1899.

A shrub, with brownish or grayish brown twigs. Leaves ovate, 6-8 cm. long, 3.2-5 cm. broad, obtuse at the apex, obtuse or subacute at the base, lustrous, the midvein prominent on both sides, the primary veins rather obscure, slightly elevated above; flowers unknown; fruiting pedicels 5-6 mm. long; sepals oval, 1.5 mm. long, pilose; fruit (immature) ovoid-globose or subglobose, 7-8 mm. long, 5 mm. in diameter.

Forests, Monte Alegre near Maricao. Endemic.

3. **Myroxylon buxifolium** (A. Gray) Krug & Urban, Bot. Jahrb. 15: 300. 1892.

Xylosma buxifolium A. Gray, Pl. Wright. 1: 155. 1860.

A shrub, or a tree sometimes 10 m. high, the trunk and branches unarmed or armed with slender simple or branched spines 0.5-3.5 cm. long. Leaves rigid, coriaceous, oblong-obovate to obovate or oval, those on sterile shoots sometimes oval-ovate, 1.5-5 cm. long, 0.9-2.5 cm. broad, rounded or mucronate at the apex, acute or obtuse at the base, entire or crenulate, lustrous above, paler beneath, the lateral venation usually obscure, the petioles 1-2.5 mm. long; fascicles 4-8-flowered; flowers dioecious; sepals lanceolate, 1 mm. long; disk fleshy, annular; stamens 8-30, the filaments 2-3 mm. long; ovary ovoid; style connate below, free above; fruit ovoid or subglobose, 4 mm. or more in diameter.

Rocky hills at lower elevations, northern and western districts of Porto Rico; St. Croix; St. Jan.—Cuba; Hispaniola; St. Eustatius; Guadeloupe. ROSETA.

Myroxylon nitidum (Hell.) Kuntze, of Jamaica, was recorded by Eggers as naturalized on St. Thomas but recent collectors have not observed it. [*Xylosma nitidum* A. Gray.]

Barren specimens of a tree about 10 m. high in the coastal forest at Sardinera near Dorado, Porto Rico, with tufts of branched thorns 5-7 cm. long on the trunk, and obovate or elliptic, coriaceous, faintly pinnately veined, acute, spinulose-tipped leaves 4-6.5 cm. long, narrowed at the base, may represent another species of *Myroxylon*.

5. **SAMYDA** L. Sp. Pl. 443. 1753.

Shrubs or small trees, with punctate distichous leaves, the large axillary flowers solitary or fascicled. Calyx campanulate, 4-6-lobed, the lobes imbricated. Petals none. Stamens 8-12, borne on the calyx; filaments connate, the anthers borne at the top of the stamen-tube. Ovary superior; style slender; ovules many, on 3-5 placentae. Fruit coriaceous, 3-5-valved at the top, many-seeded. [Ancient Greek name for some tree.] About 5 species, natives of tropical America. Type species: *Samyda Guidonia* L., which may not be congeneric with the following species.

Leaves glabrous or sparingly pubescent, the weak teeth sometimes appressed or directed toward the margin.

Leaves pubescent on both sides, the teeth rigid, spine-like.

1. *S. spinulosa*.
2. *S. dodecandra*.

1. *Samyda spinulosa* Vent. *Choix des Plantes* 43. 1803.

Guayabilla odorata Sessé & Moç. *Fl. Mex. ed. 2*, 113. 1894.

A shrub, 1-4 m. tall, the young twigs usually densely clothed with rather stiff ferruginous hairs. Leaves oblong to oval, or somewhat obovate, 5-15 cm. long, 2-6.5 cm. broad, glabrous above or pubescent along the midrib and primary veins on both sides, acuminate or acute, rarely rounded at the apex, rounded or sometimes acutish at the base, finely serrulate; petioles 2-7 mm. long; calyx white, 1.3-1.6 cm. long, densely pubescent on the inside with more or less appressed ferruginous hairs, its lobes oval or ovate, 6-7 mm. long; fruit ellipsoid, its valves 3 cm. long, 1.5 cm. broad; seeds short-ovoid, brown, about 3 mm. long, 2 mm. in diameter. [*S. glabrata* of Grisebach, in part, not of Swartz.]

Woods, thickets and forests, Porto Rico, at lower and middle elevations in wet or moist districts; Crown, St. Thomas (according to Eggers). Endemic. GAITA. SOLDIER CRAB TREE.

2. *Samyda dodecandra* Jacq. *Enum.* 21. 1760.

Samyda serrulata L. *Sp. Pl. ed. 2*, 558. 1762.

A shrub, 2-4 m. tall, occasionally a tree up to 6 m., the young twigs densely clothed with rusty tomentum. Leaves oblong to oval, ovate or somewhat obovate, 3-11 cm. long, 1.5-5.5 cm. broad, more or less velvety-pubescent and reticulate-veined on both sides, acute to short-acuminate at the apex, rounded or subtruncate at the base, finely serrulate; petioles 3-4 mm. long; calyx pubescent on the inside, its lobes elliptic or ovate, 4-5 mm. long; fruit ellipsoid, 2-3 cm. long.

Woodlands, thickets and arroyos at lower elevations, Porto Rico, most abundant in the southern dry districts; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda;—Cuba; Hispaniola; St. Martin to St. Vincent; Trinidad (?).

6. *CASEARIA* Jacq. *Enum.* 4, 21. 1760.

Shrubs or trees, sometimes spinescent, with alternate, mostly toothed and punctate or lineate leaves, small stipules, and small regular green or yellowish flowers in bracted, lateral fascicles or umbels, the pedicels jointed at or above the base. Calyx-lobes 4-6, imbricated. Petals wanting. Stamens 6-15; filaments distinct or united below, alternating with staminodia. Ovary superior; ovules many, borne on parietal placentae; style short, undivided or 3-cleft; stigma capitate. Capsule dry or fleshy, 3-4-valved, several-many-seeded. Seeds with a fleshy aril, the testa coriaceous; endosperm fleshy. [Commemorates John Casarius, a Dutch missionary of the seventeenth century.] Over 75 species, natives of tropical and subtropical regions. Type species: *Casearia nitida* (L.) Jacq.

Capsule small, 3-4 mm. in diameter; leaves serrulate, acuminate, persistent.

Leaves green on both sides; style 3-cleft.

Leaves pale-tomentulose beneath; style not 3-cleft.

Capsule larger, 6-10 mm. in diameter.

Leaves 1.5-3 times as long as wide, mostly narrowed at the base, mostly deciduous.

Stamens 10; leaves glabrous.

Stamens 8; leaves pubescent or glabrous.

Branches mostly spinescent; leaves 3-7 cm. long

Unarmed; leaves 5-16 cm. long.

Leaves 3-4 times as long as wide, rounded at the base.

1. *C. sylvestris*.

2. *C. arborea*.

3. *C. decandra*.

4. *C. aculeata*.

5. *C. guianensis*.

6. *C. bicolor*.

1. *Casearia sylvestris* Sw. *Fl. Ind. Occ.* 752. 1800.

Samyda parviflora L. *Syst. ed. 10*, 1025. 1759. Not Loeff. 1758.

Casearia parviflora Willd. *Sp. Pl. 2*: 627. 1799.

(?) *Anavinga samyda* Gaertn. *f. Fr. & Sem.* 3: 241. 1807.

Cascaria punctata Spreng. Neue Entd. 2: 154. 1821.

C. sylvestris platyphylla DC. Prodr. 2: 49. 1825

Cascaria sylvestris Wydleri Briquet, Ann. Cons. Jard. Bot. Gen. 2: 74. 1898.

A shrub, or a tree 6–10 m. tall, occasionally up to 20 m. Leaves persistent, lanceolate to ovate or elliptic, 3–14 cm. long, acute to long-acuminate at the apex, narrowed or rounded at the base, entire or obscurely serrulate, glabrous, punctate with numerous pellucid dots and lines; petioles 3–6 mm. long; pedicels articulated a little below the middle; calyx-lobes oblong to oval, 1.5 mm. long, rounded at the apex, ciliate; style trifid, with 3 capitate stigmas; capsule globose or subglobose, 3–4 mm. in diameter.

Woods, forests, thickets and hillsides, Porto Rico, at lower and middle elevations in moist or wet districts; Vieques; St. Croix; St. Thomas; St. Jan; Tortola:—Jamaica; Cuba; Hispaniola; St. Martin to Trinidad; continental tropical America. CAFEILLO CIMARRON. SARNA DE PERRO.

2. *Casearia arborea* (L. C. Rich.) Urban, Symb. Ant. 4: 421. 1910.

Samyda arborca L. C. Rich. Act. Soc. Hist. Nat. Paris 1: 109. 1792.

Casearia stipularis Vent. Choix des Plantes 46. 1803.

Casearia incana Bert.; Spreng. Syst. 2: 355. 1825.

Samyda virgata Sessé & Moç. Fl. Mex. ed. 2, 113. 1894.

A tree reaching a height of 15 m., or shrubby. Leaves persistent, narrowly oblong-lanceolate to lanceolate, 3–10 cm. long, long-acuminate at the apex, narrowed or obtuse at the base, glabrous above, permanently clothed beneath with a dense pale brown tomentum, finely serrulate; pellucid dots and lines scattered; petioles 2–3.5 mm. long; pedicels articulated above the middle; calyx-lobes ovate to elliptic, 2–2.5 mm. long, rounded at the apex, densely pubescent; style simple; stigma capitate; capsule ovoid, about 4 mm. in diameter.

Woodlands and forests in wet or moist districts, Porto Rico, ascending to 1000 m. altitude; St. Thomas:—Cuba; Hispaniola; northeastern South America. The St. Thomas record is based on a specimen from the herbarium of Dr. Otto Kuntze, labelled as collected there by him in February, 1874; Urban (Symb. Ant. 7: 75) states that this was probably from Porto Rico, however. GIA VERDE. RABOJUNCO.

3. *Casearia decandra* Jacq. Enum. 21. 1760.

Casearia parvifolia Willd. Sp. Pl. 2: 628. 1799.

Crateria fasciculata Turcz. Bull. Soc. Nat. Mosc. 31: 463. 1858. Not Pers.

Samyda lancifolia Sessé & Moç. Fl. Mex. ed. 2, 113. 1894.

Samyda decandra Jacq. Enum. 21. 1760.

A shrub, 2–3 m. tall, or tree up to 7 or 8 m. Leaves deciduous, elliptic-lanceolate to elliptic or oval, 3–9 cm. long, 1.5–4 cm. broad, acuminate at the apex, narrowed or sometimes obtuse at the base, glabrous on both sides or occasionally with tufts of hairs in the axils of the veins beneath, serrulate; pellucid dots and lines often not very conspicuous; petioles about 3 mm. long; calyx-lobes oblong or oblong-elliptic, 2.5–3 mm. long, pubescent; stamens 10; style simple; stigma capitate; fruit globose, 8–10 mm. in diameter. [*Casearia ulmifolia* of Bello, not of Vahl; *Casearia Samyda* of Bello and of Stahl, not of de Candolle; *C. parvifolia microcarpa* of Eggers.]

Woods, thickets and hillsides, Porto Rico, mostly in wet or moist districts, ascending to middle or higher elevations; Vieques; St. Croix (according to Eggers); St. Thomas; St. Jan; Tortola; Virgin Gorda:—St. Martin and Saba to Trinidad; Margarita; northern South America. GIA MAUSA. CARACOLILLO. PALO BLANCO. WILD HONEY-TREE. WILD CHERRY.

4. *Casearia aculeata* Jacq. Enum. 21. 1760.

Samyda spinosa L. Sp. Pl. ed. 2, 557. 1762.

Casearia spinosa Willd. Sp. Pl. 2: 626. 1790.

Casearia hirta Sw. Fl. Ind. Occ. 756. 1803.

Casearia hirsuta glabrata DC. Prodr. 2: 50. 1825.

Casearia Berteriana Turcz. Bull. Soc. Imp. Nat. Mosc. 31: 461. 1858.

Casearia ramiflora spinosa Griseb. Fl. Br. W. I. 24. 1859.

A shrub or small tree, the branches usually armed with simple or branched spines 1.5–3.5 cm. long, usually pubescent with rather stiff straight hairs. Leaves deciduous, elliptic to oval or obovate, 2.5–7 cm. long, obtusely short-acuminate, acute or obtuse at the apex, narrowed or rounded at the base, glabrous or with few scattered hairs along the midrib above, densely pubescent with rather long stiff hairs or nearly glabrous beneath, punctate with numerous pellucid dots and lines; petioles 1.5–6 mm. long; calyx-lobes oblong, 3–3.8 mm. long; fruit globose or globose-ellipsoid, 6–8 mm. in diameter. [*C. ramiflora* of Stahl, not of Vahl].

Thickets, woods and hillsides at lower and middle elevations, southern and western districts of Porto Rico.—Jamaica; Cuba; Hispaniola; continental tropical America.

5. **Casearia guianensis** (Aubl.) Urban, Symb. Ant. 2: 322. 1902.

Troucana guianensis Aubl. Pl. Guian. 1: 329. 1775.

Casearia ramiflora Vahl, Symb. 2: 50. 1791.

Casearia ulmifolia DC. Prodr. 2: 49. 1825.

Samyda octandra Sessé & Moc. Fl. Mex. ed. 2, 113. 1894.

A shrub, 3–4 m. tall, or a tree up to 10 m. high. Leaves elliptic-obovate, obovate or elliptic, 5–16 cm. long, 2.3–7 cm. wide, abruptly short-acuminate or occasionally acute or rounded at the apex, inequilateral and acute or rounded at the base, glabrous or sparingly pilose above, often pilose beneath, especially along the veins, crenate-serrate, the pellucid dots and lines numerous, the petioles 4–7 mm. long; pedicels articulated below the middle; calyx-lobes oblong or oblong-elliptic, 4 mm. long, pilose; style simple; stigma capitate; fruit ellipsoid or subglobose, 8–11 mm. long. [*Casearia nitida* of Stahl and of Kuntze, not of Jacquin; *C. hirta* of Millspaugh, not of Swartz.]

Thickets, woods and hillsides at lower and middle elevations in wet or moist districts of Porto Rico; Vieques; St. Croix; St. Thomas; St. Jan.—Jamaica; Cuba; Hispaniola; Guadeloupe to Trinidad; Margarita; continental tropical America. CAFFEILLO. WILD COFFEE.

6. **Casearia bicolor** Urban, Symb. Ant. 1: 372. 1899.

A tree, 15 m. high, the twigs blackish brown. Leaves oblong or elliptic-oblong, 7–14 cm. long, 2.5–4.5 cm. broad, acute to short-acuminate at the apex, more or less equilateral and rounded or obtuse at the base, serrulate, glabrous, punctate with pellucid dots and lines, the midrib puberulent; the petioles 4 or 5 mm. long; calyx-lobes oval, those on fruiting specimens 3.5 mm. long, 2 mm. broad, glabrous on both sides; fruit globose, 9–10 mm. in diameter, glabrous, seeds short-obovoid, 2.5–3 mm. long, 2 mm. broad.

Primeval forest, Santa Isabel near Utuado, collected only by Sintenis. Endemic. TALANTRON.

Barren specimens of a tree 15 m. high in the mountain forest at La Juanita, near Las Marias, Porto Rico, with membranous glabrous serrulate pellucid-dotted leaves 18 cm. long and about 5 cm. wide, the apex long-acuminate, base rounded or subcordate, the petioles 3 mm. long, may represent another *Casearia*.

Flacourtia Ramontchi L'Her., MADAGASCAR PLUM, GOVERNOR'S PLUM, Madagascan, occasionally grown for its edible fruit in Porto Rico and the Virgin Islands, is a tree up to 10 m. high, or higher, with thin, ovate to elliptic, pointed crenate leaves 5–8 cm. long, the small, mostly dioecious, yellowish flowers racemose, the globose black berry-like fruits about 12 mm. in diameter.

Flacourtia cataphracta Roxb., CHINESE PLUM, occasionally grown for its fruit in Porto Rico, is a small spiny tree with lanceolate or ovate-lanceolate

acuminate leaves, small green clustered flowers, and globose fruit about 1.5 cm. in diameter.

Hydnocarpus castanea Hook. f. & Thoms., East Indian, introduced at the Insular Experiment Station, Rio Piedras, is a tree, with glabrous narrowly oblong leaves and small dioecious axillary flowers, the large fruit globose.

Taraktogenos Kurzii King, Burmese, the tree yielding chaulmoogra oil, a curative for leprosy, was grown as a young plant at the Rio Piedras Station in 1923.

Family 10. VIOLACEAE DC.

VIOLET FAMILY.

Herbs, shrubs, or rarely trees, with basal or alternate, simple, lobed or entire stipulate leaves and solitary or clustered, perfect, mostly irregular flowers. Sepals 5, hypogynous, imbricated in the bud, the lower one larger or with a posterior spur. Stamens 5; anthers erect, connivent or syngenesious. Ovary simple, 1-celled, with 3 parietal placentae. Fruit usually a loculicidal capsule. Seeds anatropous. About 15 genera and over 325 species, of wide distribution.

1. **IONIDIUM** Vent. Jard. Malm. 27. 1803.

Herbs, rarely small shrubs, with simple opposite or alternate leaves, and axillary or racemose flowers. Peduncles or pedicels one-flowered, solitary in the axils of the leaves or bracts. Sepals somewhat unequal. Petals unequal, the lower one longest, gibbous or saccate at the base, the two upper shorter than the lateral ones. Filaments distinct, the lower spurred or glandular; anthers connivent. Capsule elastically 3-valved. Seeds ovoid-globose, with hard seed-coats. [Latin, slipper-like.] A genus of about 60 species, mostly natives of tropical America. Type species: *Ionidium polygalacifolium* Vent.

Leaves 4-10 times as long as wide.
Leaves 2-3 times as long as wide.

1. *I. linearifolium*,
2. *I. portoricense*.

1. **Ionidium linearifolium** (Vahl) Britton.

Viola linearifolia Vahl in West, St. Croix 303. 1793.

Ionidium strictum Vent. Jard. Malm. 1: 27. 1803.

Hybanthus linearifolius Urban, Symb. Ant. 5: 436. 1908.

Calcolaria linearifolia Britton, Mem. Brooklyn Bot. Gard. 1: 70. 1918.

Stems slender, 15-50 cm. high, puberulent. Stipules linear-subulate, 1.8-2 mm. long; leaves often opposite, oblong-linear to oblanceolate or obovate, 2-4.5 cm. long, 2.6-10 mm. wide, obtuse or acute at the apex; tapering at the base into a short petiole; flowers about 5-6 mm. long; sepals lanceolate to ovate-lanceolate, 2-3 mm. long, long-acuminate; petals bluish or bluish-white; capsule subglobose or globose-ovoid, 3.5-4 mm. long; seeds short-ovoid, 1.8-2 mm. long, shining.

On rocks and hillsides in the dry southern and southwestern districts and near Aguadilla, Porto Rico; St. Croix; Water Island, St. Thomas; Cuba; Hispaniola.

2. **Ionidium portoricense** Krug & Urban (Symb. Ant. 5: 438, as synonym. 1908).

Hybanthus portoricensis Urban, Symb. Ant. 5: 438. 1908.

Stems 4-15 cm. high, puberulent. Stipules linear-subulate, 0.6-1.3 mm. long; lower leaves alternate, obovate or elliptic-obovate, 1.2-3 cm. long, 0.6-1.3 cm. broad, obtuse or acute at the apex, tapering at the base, remotely crenulate,

the upper leaves mostly opposite or subopposite; flowers 5–6.5 mm. long; sepals ovate-oblong or somewhat lanceolate, acuminate, 1.5–2 mm. long; petals whitish-purple or white; ovary ovoid-globose; capsule subglobose, 2.8–3 mm. long; seeds short-obovoid, 1.3–1.8 mm. long.

Fields and thickets near Guanica and Coamo:—Hispaniola.

Viola odorata L., SWEET VIOLET, European, grown for its fragrant flowers in Porto Rico and Virgin Island gardens, is a low acaulescent herb, spreading by stolons, the leaf-blades suborbicular, cordate, crenate, about 5 cm. broad, the blue or rarely white flowers solitary on slender scapes about as long as the leaves.

Family 11. **TURNERACEAE** H. B. K.

TURNERA FAMILY.

Annual or perennial herbs, or shrubs, with alternate simple leaves mostly serrate and often 2-glandular at the base, the flowers regular, mostly perfect. Peduncle free or connate with the petiole, often articulated. Calyx-lobes or sepals 5, imbricated. Petals 5, thin, convolute, fugacious. Stamens 5, distinct, opposite the sepals; filaments compressed or subulate; anthers oblong. Ovary superior, 1-celled, with 3 parietal placentae; styles 3, filiform, simple or 2-cleft; stigmas usually flabellate and many-cleft; ovules many, anatropous. Fruit a 1-celled capsule, partly or completely 3-valved. Seeds foveolate, with fleshy endosperm and a membranous aril. Six genera and over 80 species, of tropical and subtropical distribution.

Receptacle of the flower with a corona.
Receptacle without a corona.

1. *Piriqueta*.
2. *Turnera*.

1. **PIRIQUETA** Aubl. Pl. Guian. 1: 298. 1775.

Herbs or shrubs, with glabrous tomentose hirsute or stellate-pubescent foliage. Leaves alternate, entire, toothed or pinnatifid, often biglandular at the base. Flowers axillary or in reduced panicles. Sepals 5, imbricated. Petals 5, yellow or purple. Filaments somewhat flattened, glabrous or somewhat pubescent. Anthers notched at the base, the apex truncate or slightly emarginate, rarely mucronate. Stigmas 3, 2-cleft, brush-like. Capsule 1-celled, loculicidally 3-valved. Seeds numerous, curved or nearly straight with a roughened testa. [Guiana name.] About 20 species, mostly American, a few Asiatic. Type species: *Piriqueta villosa* Aubl.

Flowers yellow.

Leaves usually of an ovate type; seeds curved, tuberculate-ridged. 1. *P. ovata*.

Leaves usually of a linear or lanceolate type; seeds nearly straight, pitted-striate. 2. *P. cistoides*.

Flowers purple; leaves usually of a lanceolate type; seeds nearly straight, pitted-striate. 3. *P. viscosa*.

1. **Piriqueta ovata** (Bello) Urban, Jahrb. Bot. Gart. Berlin 2: 76. 1883.

Turnera ovata Bello, Ann. Soc. Esp. Hist. Nat. 10: 275. 1881.

Annual, the stem 18–60 cm. tall, pubescent with long rather stiff, yellowish-brown hairs. Leaves ovate, rarely oblong-ovate, 2–4.7 cm. long, 1.2–5 cm. broad, obtuse or acutish at the apex, rounded or obtuse at the base, usually velvety stellate-pubescent, short-petioled, crenulate; flowers solitary; peduncle slender, 1.5–3.5 cm. long, the fruiting pedicel 2–4 mm. long; calyx 6–7 mm. long, the lobes lanceolate, obtuse; petals cuneate, about 9 or 10 mm. long, yellow; corona 0.5–0.8 mm. long, fimbriate-lacerate; filaments glabrous; capsule 7–9 mm. long; seed curved, tuberculate-ridged, 2 mm. long.

Along the coast near Mayaguez:—Hispaniola; Bonaire; Curaçao.

2. *Piriqueta cistoides* (L.) Meyer; Steud. Nom. ed. 2, 2: 344. 1841.

Turnera cistoides L. Sp. Pl. ed. 2, 387. 1762.

Piriqueta longifolia Bello, Amer. Soc. Esp. Hist. Nat. 10: 275. 1881.

Piriqueta villosa Cook & Collins, Contr. U. S. Nat. Herb. 8: 220. 1903.

Annual, the stem simple or much branched, 12–60 cm. tall, pubescent with long stiff light brown hairs. Leaves linear-lanceolate to lanceolate or occasionally ovate-lanceolate, 2.5–9 cm. long, 0.3–1.5 cm. broad, acute or obtuse at the apex, rounded or acutish at the base, stellate-pubescent on both sides, short-petioled, serrulate or nearly entire; flowers axillary, solitary, peduncle 0.5–3.3 cm. long, erect-spreading; pedicels 3–6 mm. long; calyx 4–9 mm. long, the lobes lanceolate, acute; petals obovate, 6–9 mm. long; corona 0.5 mm. long; filaments glabrous; capsule ellipsoid to subglobose, 4.5–9 mm. long, 3–7 mm. in diameter; seeds oblong-obovoid, nearly straight or slightly curved, 1.5–1.8 mm. long, pitted-striate.

Fields and hillsides, Porto Rico, at lower elevations:—Jamaica; Cuba; Hispaniola; St. Eustatius to Trinidad; continental tropical America.

3. *Piriqueta viscosa* Griseb. Cat. Pl. Cub. 114. 1866.

Annual with simple or branched stems 15–60 cm. tall, pubescent with stellate and simple hairs intermixed. Leaves oblong-lanceolate, lanceolate or ovate, 2–5 cm. long, 0.5–2.2 cm. broad, acute to acuminate at the apex, cuneate at the base, crenulate or occasionally serrate, short-petioled; flowers solitary; peduncle slender, erect or erect-spreading, 1.5–4 cm. long, the pedicel 3–5 mm. long; calyx 5–7 mm. long, the lobes oblong or lanceolate, acuminate; petals obovate, 5–8 mm. long, 3–4 mm. broad, purple; corona 0.5–1 mm. long, the margin fimbriate; filaments glabrous; capsule subglobose, sometimes tuberculate, 5–8 mm. in diameter, seeds oblong-ellipsoid, 1.8–2 mm. long, pitted-striate.

Hillside thickets, St. Thomas:—Cuba; South America.

2. **TURNERA** L. Sp. Pl. 271. 1753.

Herbs or low shrubs, with toothed leaves and solitary axillary yellow flowers, the peduncles often adnate to the petioles. Calyx 5-cleft. Petals obovate to spatulate, borne on the calyx-throat. Stamens borne below the petals, sometimes hypogynous. Ovary sessile; styles filiform; stigmas several-many-cleft. Capsule 3-valved to the base, mostly many-seeded, the seeds borne near the middle of the valves, oblong or cylindrical, curved, the aril narrow. [In honor of William Turner, herbalist, the "Father of English Botany," died 1568.] About 60 species, nearly all of tropical and subtropical America. Type species: *Turnera ulmifolia* L.

Peduncle adnate to the petiole.

Annual; flowers clustered.

Perennial; flowers eventually scattered.

Peduncle free from the petiole; flowers axillary; small-leaved shrub.

1. *T. pumilea*,
2. *T. ulmifolia*,
3. *T. diffusa*.

1. *Turnera pumilea* L. Syst. ed. 10, 965. 1759.

An annual herb, with ascending or prostrate branches 10–25 cm. long, the stems and leaves more or less densely villous-hirsute. Leaves obovate, oblanceolate, ovate or ovate-lanceolate, 1.5–6 cm. long, distinctly petioled and coarsely toothed, acute at the apex, cuneate and sometimes with glands at the base; flowers clustered; calyx 6–7 mm. long; petals a little longer than the calyx-lobes; seeds obovoid-oblong, curved, the surface deeply reticulate.

Grassy situations and in cultivated grounds at lower elevations, northern coastal plain and southern dry districts of Porto Rico:—Jamaica; Cuba; Hispaniola; Curaçao; South America.

2. *Turnera ulmifolia* L. Sp. Pl. 271. 1753.

Turnera angustifolia Mill. Gard. Dict. ed. 8. 1768.

Turnera ulmifolia angustifolia Willd. Sp. Pl. 1: 1503. 1797.

Turnera ulmifolia intermedia Urban, Jahrb. Bot. Gart. Berlin 2: 140. 1883.

Turnera ulmifolia acuta Urban, Jahrb. Bot. Gart. Berlin 2: 142. 1883.

Turnera scabra Millsp. Field Mus. Bot. 2: 77. 1900.

Shrubby, erect, branched, 3-9 dm. high, more or less pubescent. Leaves lanceolate to ovate-oblong, thin, short-petioled, 2-11 cm. long, serrate, acute or acuminate at the apex, mostly narrowed at the 2-glandular base; peduncles short; bractlets as long as or longer than the calyx; calyx deeply 5-lobed, its segments lanceolate, acute or acuminate; petals obovate, 1-3 cm. long; capsule 6-10 mm. long, much shorter than the bractlets, 3-valved above. [*T. cuneiformis* of Bello? not of Poiret.]

Banks, coastal sands, sandy fields, hillsides and waste grounds, Porto Rico, at lower elevations; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda;—Bermuda; Bahamas; Jamaica; Cuba; Hispaniola; St. Martin; St. Barts; St. Eustatius; Saba; Margarita; Curaçao; continental tropical America. Planted for ornament in Virgin Island gardens. Races differ in size and shape of leaves, in size of flowers and in pubescence. MARI-LOPEZ. YELLOW ALDER.

3. *Turnera diffusa* Willd.; Schultes, Syst. 6: 679. 1820.

Turnera microphylla Desv.; Hamilt. Prodr. 33. 1825.

Triacis microphylla Griseb. Fl. Br. W. I. 297. 1860.

A pubescent, much-branched shrub, 2 dm. to 1.3 m. high, the branches slender, spreading. Leaves small, 5-20 mm. long, spatulate or oblanceolate, firm in texture, coarsely few-toothed, nearly sessile, deeply impressed-veined and pubescent or glabrous above, pubescent beneath, mostly obtuse at the apex, cuneate at the base, the margin revolute; peduncles very short; calyx 5-toothed; petals spatulate, 3-8 mm. long, much longer than the calyx-teeth; stamens very short; capsule subglobose, about 1.5 mm. in diameter, 3-valved to the base. [*T. parviflora* of Bello.]

Coastal thickets and rocky hillsides, Porto Rico, in the dry southwestern districts at lower elevations; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Virgin Gorda;—Bahamas; Jamaica; Cuba; Hispaniola; continental tropical America.

Order 19. PASSIFLORALES.

Herbs, tendril-bearing vines, shrubby plants, or succulent trees with a milky sap. Leaves alternate, entire or lobed. Flowers perfect, or when dioecious, the staminate and pistillate very different. Calyx of 5 more or less united sepals. Corolla of 5 distinct or partially united petals, sometimes accompanied by a fringed crown. Stamens 5 or 10 in 2 unequal rows. Ovary superior, 1-celled, with 3-5 parietal placentae. Stigmas entire, notched or forked. Fruit a berry or capsule.

Corolla accompanied by a crown (corona); flowers perfect, all alike; mostly vines.

Corolla not accompanied by a crown; flowers mainly dioecious, the staminate and pistillate different; trees.

Fam. 1. PASSIFLORACEAE.

Fam. 2. CARICACEAE.

Family 1. PASSIFLORACEAE Dumort.

PASSION-FLOWER FAMILY.

Vines, climbing by tendrils, or rarely erect herbs, with petioled entire dentate or lobed leaves, and perfect regular flowers. Calyx-tube persistent. Petals usually 5, inserted on the throat of the calyx, distinct, or in some

species united, or wanting. Stamens 5. Throat of the calyx crowned with a double or triple fringe. Filaments subulate or filiform, monadelphous, or separate. Ovary free from the calyx, 1-celled; placentae 3-5, parietal; styles 1-5. Fruit a berry or capsule, usually many-seeded. About 18 genera and 350 species, of warm and tropical regions, most abundant in South America.

1. **PASSIFLORA** L. Sp. Pl. 955. 1753.

Climbing tendril-bearing vines, with alternate or rarely opposite leaves, and axillary flowers, on usually jointed, often bracted peduncles. Calyx-tube cup-shaped or campanulate, 4-5-lobed, the lobes narrow, imbricated in the bud, its throat crowned with a fringe called the corona. Petals 4 or 5 (rarely none), inserted on the throat of the calyx. Ovary oblong, stalked. Filaments monadelphous in a tube around the stalk of the ovary, separate above; anthers narrow, versatile. Fruit a many-seeded berry. Seeds pulpy-angled, flat, ovate; endosperm fleshy. [Flower of the Cross, or Passion, as emblematic of the crucifixion.] About 300 species, mostly of tropical America, a few in Asia and Australia. Type species: *Passiflora incarnata* L. The plants are known as PORCHA and as FLOR DE PASION or PASSION-FLOWER

A. Flowers involucrate by 3 large foliaceous bracts.

Leaves entire.

Petiole 2-glandular near the middle.

Petiole 2-glandular at the top.

Leaves pedately 5-7-cleft.

B. Flowers subtended by small or pectinate-pinnatifid bracts, or bractless.

1. Flower-tube cylindric or cylindric-campanulate, leaves 2-lobed or 3-lobed.

Leaves, at least the upper ones, as long as wide or longer.

Leaves wider than long, the lobes emarginate.

2. Flower-tube short or none.

Petals none.

Petals present.

Flowers subtended by large pinnatisect bracts.

Bracts small, not pectinate-pinnatifid.

Leaves 2-lobed, mostly broader than long.

Flowers solitary, slender-peduncled, 3-4 cm. broad.

Flowers clustered, 1.5-2 cm. broad, the cluster short-peduncled.

Leaves entire, longer than broad.

1. *P. maliformis*.

2. *P. laurifolia*.

3. *P. serrato-digitata*.

4. *P. Tulae*.

5. *P. bilobata*.

6. *P. pallida*.

7. *P. foetida*.

8. *P. rubra*.

9. *P. sexflora*.

10. *P. multiflora*.

1. **Passiflora maliformis** L. Sp. Pl. 956. 1753.

A woody vine, up to 10 m. long or longer, the foliage glabrous. Leaves submembranous or chartaceous, the blade ovate or ovate-oblong, entire, pinnately veined, 6-15 cm. long, the apex acute or acuminate, the base rounded or subcordate, the slender petioles 2-glandular at or a little above the middle; peduncles slender, about as long as the petioles; involucre-bracts ovate, acute or acuminate, membranous, puberulent within, about 5 cm. long, longer than the variegated flower; petals 5; crown 3-seriate; berry globose, hard, about 3 cm. in diameter.

Forests and thickets, at lower and middle elevations, in moist or wet districts, Porto Rico; St. Thomas (ex Krebs);—Jamaica; Cuba; Hispaniola; Saba to Barbados; northern South America. Planted for its fruit in Porto Rico and the Virgin Islands. PORCHA CIMARRONA.

2. **Passiflora laurifolia** L. Sp. Pl. 956. 1753.

A glabrous woody vine, up to 10 m. long or longer. Leaves subcoriaceous, the blade oval to elliptic-ovate, entire, pinnately veined, 6-12 cm. long, the apex obtuse or acute, the base rounded or subcordate, the short stout petioles 2-glandular at the top; peduncles 2-3 times as long as the petioles; involucre-bracts ovate, glabrous, about 2.5 cm. long, obtuse, with large marginal glands toward the

apex; flowers variegated, about as long as the involucre; petals 5; crown 3-seriate; berry oval, hard, yellow, 6-7 cm. long.

Thickets and woodlands, St. Croix; St. Thomas; St. Jan.—Cuba; Hispaniola; St. Barts to Trinidad and northern South America. Much planted in tropical and subtropical regions for its edible fruit; not definitely known to be native in Porto Rico. BELL APPLE.

3. *Passiflora serrato-digitata* L. Sp. Pl. 960. 1753.

Passiflora serrata L. Syst. ed. 10, 1248. 1759.

Passiflora digitata L. Sp. Pl. ed. 2, 1360. 1763.

An elongated, partly woody, glabrous vine up to 6 m. long or longer. Leaves membranous, the blades suborbicular-reniform in outline, deeply 5-7-lobed, palmately veined, 8-15 cm. broad, the lobes oblong-ob lanceolate, acute or acuminate, low-serrate, the long and slender petioles bearing 2 glands at the top and 2 at the middle; peduncles shorter than the petioles; involucre-bracts ovate, acute, entire, 2.5-3 cm. long, about as long as the flower; petals 5; crown 3-seriate; berry globose to ellipsoid, 4-5 cm. thick.

Thickets, forests and river-banks, Porto Rico, at lower and middle elevations:—Guadeloupe to St. Vincent; Trinidad; South America. TAGUA-TAGUA.

4. *Passiflora Tulae* Urban, Symb. Ant. 1: 374. 1899.

A partly woody vine, 6 m. long or longer, glabrous, or the young shoots puberulent. Leaves chartaceous, the blades 4-10 cm. broad and mostly about as long as broad, 3-nerved, the base rounded, the apex subtruncate, 2-lobed or 3-lobed, the lobes rounded, obtuse or acute, the petioles 1-3 cm. long, slender, glandless; peduncles solitary or 2 together, 2-5 cm. long; flowers exinvolucrate; sepals and petals narrowly oblong, rose-colored, about 4 cm. long; crown yellow, about one-half as long as the sepals, the outer undulate, not filamentous; fruit globose or oval, about 1.5 cm. in diameter. [*Murucuja ocellata* of Bello, not of Persoon; *Passiflora Murucuja* of Stahl, not of Linnaeus.]

Mountain forests at middle and higher elevations, Porto Rico. Occasionally some of the leaves are divergently 2-lobed and wider than long. Endemic.

5. *Passiflora bilobata* Juss. Ann. Mus. Paris 6: 107. 1895.

A short slender vine, the young shoots puberulent. Leaves short-petioled, subcoriaceous, broader than long, finely reticulate-veined, 3-5 cm. wide, deeply 2-lobed with a rounded sinus, the lobes ascending or divaricate, oblong or obovate, emarginate or subtruncate; petioles eglandular; flowers solitary or 2 together in the axils, short-peduncled; about 1 cm. long; exterior corona of filiform filaments; middle corona membranous; gynophore about 5 mm. long; berry globose, nearly 1 cm. in diameter; seeds transversely sulcate.

Limestone hill, Peñon, between Guayanilla and Tallaboa, Porto Rico, (*Shafer 1995*); also recorded by Urban as collected in Porto Rico by Read:—Hispaniola.

6. *Passiflora pallida* L. Sp. Pl. 955. 1753.

Passiflora minima L. Sp. Pl. 958. 1753.

Passiflora hirsuta L. Sp. Pl. 958. 1753.

Passiflora suberosa L. Sp. Pl. 958. 1753.

Passiflora parviflora Sw. Prodr. 97. 1788.

Passiflora angustifolia Sw. Prodr. 97. 1788.

Passiflora peltata Cav. Diss. 10: 447. 1790.

Passiflora hederaea Cav. Diss. 10: 448. 1790.

Passiflora lineariloba Hook. f. Trans. Linn. Soc. 20: 222. 1847.

A slender herbaceous vine, with nearly glabrous or pubescent foliage. Leaves ovate to linear, 6-15 cm. long, ciliate, 5-nerved at the broadly cuneate

or cordate base, entire, toothed, or 3-lobed to above the middle, the lobes ovate or triangular, acute or acuminate, the middle one much the larger; petioles 5–15 mm. long, each with 2 glands at or above the middle; peduncles surpassing the petiole; commonly in pairs; calyx greenish, 2–2.5 cm. broad; sepals lanceolate or linear-lanceolate; 8–12 mm. long; corolla wanting; crown-filaments purple at the base, shorter than the sepals; berry subglobose or oval, 10–12 mm. in diameter.

Hillsides, banks, thickets and woodlands, Porto Rico, ascending to higher elevations; Icaicos; Culebra; Vieques; Muertos; Mona; Desecheo; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada:—Florida; Bermuda; West Indies and continental tropical America. Consists of many races, differing in leaf-form and pubescence.

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

Passiflora hibiscifolia Lam. Encycl. 3: 39. 1789.

Herbaceous, villous and glandular-viscid, trailing or climbing, sometimes 2.5 m. long. Leaves slender-petioled, broadly ovate or ovate-orbicular in outline, 3-lobed or 3-angled, flaccid, irregularly low-dentate, 3–12 cm. long, cordate or subcordate at the base, acute at the apex, the stipules 5–10 mm. long, pinnatisect; peduncles 1–3 in the axils, mostly longer than the petioles, not jointed; involucre of 3 finely pinnatisect bracts 2–4 cm. long, the ultimate segments nearly filiform, gland-tipped; calyx 5-parted, 1.5–2.5 cm. long; petals white or pinkish, about as long as the calyx; crown pink, of three series of segments; berry ovoid, 2–4 cm. long, nearly dry when mature.

Hillsides, thickets, waste and cultivated grounds, Porto Rico, at lower and middle elevations; Mona; Culebra; Vieques; St. Croix; St. Thomas; Tortola:—West Indies; continental tropical America. Old World tropics. LOVE-IN-THE-MIST. POP BUSH. TAGUA-TAGUA.

8. *Passiflora rubra* L. Sp. Pl. 956. 1753.

A softly pubescent slightly woody vine, sometimes 2 m. long or more. Leaves thin, eglandular, the blade broader than long, 7–12 cm. broad, 5-nerved, deeply cordate at the base, broadly 2-lobed or subtruncate, the lobes ovate, acute or acutish, the midvein excurrent, the petioles 1–4 cm. long; peduncle; solitary or 2 in the axils, slender or filiform, longer than the petioles, jointed below the flower; flowers 3–5 cm. broad, greenish-white, the 5 sepals somewhat longer than the 5 petals; crown of 3 series of subulate processes, about as long as the petals; berry oval or subglobose, pubescent, 6-ribbed, 2–4 cm. in diameter, longer than the carpophore. [*P. pubescens* of Krebs.]

Woodlands and thickets, Porto Rico, ascending to higher elevations mostly in wet or moist districts; Vieques; St. Croix; St. Thomas; St. Jan:—West Indies; continental tropical America.

9. *Passiflora sexflora* Juss. Ann. Mus. Paris 6: pl. 37. 1805.

A velvety-pubescent, slender, subherbaceous vine up to 6 m. long or longer. Leaves thin, eglandular, the blade broader than long, 5–12 cm. wide, 3-nerved, cordate or subcordate, 2-lobed or 3-lobed, the lobes obtuse or acute, the petioles 1–3 cm. long; flowers greenish-white, 10–12 mm. broad, several together in small, short-peduncled, axillary cymes; pedicels short; sepals about as long as the 5 petals; crown 3-seriate, about as long as the petals; berries globose, pubescent, about 10 mm. in diameter.

Forests and thickets, mostly at higher elevations in wet districts, Porto Rico:—Florida: Cuba; Hispaniola; recorded from St. Kitts; Mexico and Central America.

10. *Passiflora multiflora* L. Sp. Pl. 956. 1753.

A somewhat woody, slender vine, climbing to a length of 6 m. or more, the stems and leaves finely pubescent or glabrous. Leaves oblong to ovate-oblong,

5–12 cm. long, entire, pinnately veined and triple-nerved, reticulate-veined beneath, obtuse or acute and mucronulate at the apex, obtuse, rounded or subcordate at the base, the short petiole 2-glandular at the top; peduncles 2–6 together in the axils, slender, jointed near the middle, 5–15 mm. long; involucre none; sepals oblong-lanceolate, greenish-yellow, about 6 mm. long; petals linear, white, shorter than the sepals; carpophore none; berry globose, 6–10 mm. in diameter.

Woods and thickets at lower and middle elevations in moist districts of Porto Rico; St. Thomas (according to Masters); St. Jan; Tortola:—Florida; Bahamas; Cuba; Hispaniola; recorded from Costa Rica.

Passiflora quadrangularis L., GRANADILLA, of Central America, planted as an ornamental vine and for its fruit in Porto Rico and the Virgin Islands, has 4-winged stems, large ovate entire leaves, involucre large variegated flowers, the fruit ovoid, up to 12 cm. long.

Passiflora incarnata L., a North American species, recorded by West in 1794 from St. Croix, is presumably an error in determination. The plant was grown from Louisiana seeds by Mrs. Maxwell in her garden at Ensenada, Porto Rico, in 1923.

Passiflora tuberosa Jacq., of Trinidad and northern South America, was recorded by Krebs as found on St. Thomas, prior to 1851. It may have been in cultivation there, or the determination may be erroneous.

Passiflora stipulata Aubl., South American, grown for ornament in St. Thomas gardens in 1923, is a glabrous vine with subcordate, deeply 3-lobed leaves, the foliaceous stipules 1–2 cm. long; the showy flowers are 7–10 cm. broad, purple and white with orange stamens.

Family 2. CARICACEAE Dumort.

PAPAW FAMILY.

Trees, with milky sap, ample broad palmately 7–9-lobed leaves and unisexual, or rarely perfect flowers. Calyx short. Staminate flowers with a salver-shaped corolla, its tube slender; the lobes 5, valvate or convolute; stamens 10, inserted in the throat of the corolla; filaments short; anthers adnate to the filaments, 2-celled. Pistillate flowers with 5 distinct petals and no staminodia; ovary compound, 1-celled, or sometimes imperfectly 5-celled, free, sessile; stigmas 5, sessile; ovules numerous, in two or many series on the 5 placentae. Fruit a large fleshy berry. Seeds numerous, flattened, with a roughened testa; endosperm fleshy; embryo axile. There are two genera, the following composed of about 25 species of tropical and subtropical distribution, and *Jacaravia* of tropical Africa and America, which differs from *Carica* by having the stamens partly united.

1. *CARICA* L. Sp. Pl. 1036. 1753.

Characters of the family. [Named from the fancied resemblance of the fruit to that of the Fig.] Type species: *Carica Papaya* L.

1. *Carica Papaya* L. Sp. Pl. 1036. 1753.

A small tree, with a simple wand-like stem, 3–6 m. tall, leafy at the top. Leaves large, thick, suborbicular in outline, 2–6 dm. broad, mostly palmately 7-lobed, pale or glaucous beneath, each lobe pinnately lobed, the segments obtuse or acute, or the larger ones acuminate; petioles stout; staminate flowers in slender

panicles 1-several dm. long; calyx of the staminate flowers 1-1.5 mm. long, that of the pistillate flowers 5-10 mm. long, the lobes longer than the tube; corolla yellow, that of the staminate flowers 2.5-3 cm. long, its tube slender, dilated near the top, its lobes lanceolate or elliptic-lanceolate, barely as long as the tube; corolla of the pistillate flowers longer, the petals distinct, lanceolate, twisted; berries oblong to subglobose, 0.6-3 dm. long, yellow or orange, with a milky juice.

Hillsides, coastal thickets, woodlands and arroyos, Porto Rico, spontaneous after cultivation for its fruit, used for food and yielding papain; Mona; Vieques; St. Croix; St. Thomas:—widely cultivated and locally spontaneous in tropical America, its original home unknown. Consists of many races, differing in the size and quality of the fruit, that of plants run wild much smaller than the valued cultivated kinds. PAPAÑA. LECHOSA. PAPAŪ.

Carica portoricensis (Solms) Urban, Symb. Ant. 4: 428, based on specimens collected in a thicket at Montalba, near Guanica, by Sintenis, is unknown to us. We failed to find any species but *C. Papaya* in the vicinity of Guanica.

Order 20. BEGONIALES.

Herbs, mostly succulent, some slightly woody, a few species climbing. Leaves alternate, entire, toothed or lobed, inequilateral; stipules 2, distinct, usually caducous. Flowers showy, monoecious, asymmetric, cymose on axillary peduncles, bracted, mostly white or rose. Staminate flowers usually with 2 opposite sepals, the petals, when present, imbricated; stamens numerous, the anthers continuous with the filaments; ovary rudimentary or wanting. Pistillate flowers usually with 2-5 perianth-segments and without stamens; ovary commonly 3-celled; styles 2-5, commonly 2-cleft; ovules very numerous, anatropous. Fruit capsular, dehiscent, or rarely baccate. Seeds many, minute, reticulated, with little endosperm or none. Only one family.

Family 1. BEGONIACEAE Lindl.

BEGONIA FAMILY.

Two genera, the following and the monotypic *Hillebrandia*, of Hawaii.

1. *BEGONIA* [Plumier] L. Sp. Pl. 1056. 1753.

A genus of many species, perhaps 400, widely distributed in tropical regions of both the Old World and the New. [Dedicated to Michel Begon, born 1638, French governor of Santo Domingo.] Type species: *Begonia obliqua* L.

1. *Begonia decandra* Pav.; DC. Ann. Sci. Nat. IV. 11: 122. 1859.

Begonia acutifolia Balbis; Kl. Begon. 25. 1855. Not Jacq.

Begonia portoricensis A. DC. Prodr. 15: 295. 1864.

Herbaceous, 3-20 dm. high, the stem branched or simple, glabrous, or sparingly pilose above. Leaves membranous, purplish or green; stipules lanceolate, entire, mucronate, 8-18 mm. long; petioles pilose, 1-6 cm. long; blades ovate, ciliate, irregularly dentate, 5-12 cm. long, glabrous above, pilose on the veins beneath, the apex acute or acuminate, the base very oblique, obtuse or cordate; peduncles elongated, erect; cymes several-flowered; flowers white to rose; pedicels filiform, those of the pistillate flowers shorter than those of staminate; pistillate flowers with 5 obovate petals about 10 mm. long; petals of the staminate flowers about 12 mm. long; capsule about 10 mm. long with a triangular-lanceolate, thin wing 1-2.5 cm. long.

Mountain forests, Porto Rico, ascending to higher elevations. Endemic. BEGONIA.

Begonia humilis Dryand., recorded by A. de Candolle as collected by Finlay in St. Thomas, was really from Trinidad.

Several kinds of *Begonias* are grown in flower gardens in Porto Rico and the Virgin Islands, among them the following:

Begonia heracleifolia C. & S., Mexican, with stout rootstocks, pubescent, 5-9-lobed leaves 1-3 dm. broad, the lobes toothed, the small many, white or rose flowers on a peduncle up to 1 m. long.

Begonia nelumbiifolia C. & S., also Mexican, with thick rootstocks, broad peltate leaves up to 4 dm. long, pubescent beneath, the many white or rose flowers rather densely clustered on a long peduncle.

Begonia incarnata L. & O., also Mexican, is glabrous, branched, up to about 1 m. in height, with oblique ovate leaves 1-2.5 dm. long, reddish beneath, and long-peduncled clusters of rose-colored flowers.

Begonia nitida Dryand, Jamaican, is glabrous, 2 m. high or less, branched, with very oblique ovate leaves 10-15 cm. long and peduncled clusters of white or pink fragrant flowers, cultivated in the variety *odorata*.

Begonia semperflorens L. & O., Brazilian, has fibrous roots, the stems and leaves glabrous or the ovate leaves with ciliate margins, the flower axillary.

Order 21. LOASALES.

Herbs, often armed with hooked stinging or viscid hairs, with estipulate leaves, and regular perfect white yellow or reddish flowers. Calyx-tube adnate to the ovary, its limb 4-5-lobed, persistent. Petals 4 or 5, inserted on the throat of the calyx. Stamens many, inserted with the petals; filaments filiform, commonly arranged in clusters opposite the petals; anthers introrse. Ovary 1-celled (rarely 2-3-celled), with 2-3 parietal placentae; ovules anatropous. Capsule usually 1-celled, crowned with the calyx-limb. Seeds mostly numerous; endosperm scanty. Only one family.

Family 1. LOASACEAE Rehb.

LOASA FAMILY.

Characters of the order. About 20 genera and 250 species, all but 1 natives of America.

1. MENTZELIA L. Sp. Pl. 516. 1753.

Erect or straggling herbs, with alternate entire lobed or pinnatifid leaves, and terminal cymose or solitary flowers. Calyx-tube cylindric, linear or club-shaped, the limb usually 5-lobed. Petals 5, convolute in the bud, spreading, deciduous. Stamens 20-100. Ovary 1-celled; styles 3, more or less united; stigmas small, obtuse. Capsule dehiscent at the summit, few-many-seeded. Seeds mostly prismatic, rough or striate. [In honor of C. Mentzel, a German botanist, died 1701.] About 35 species, natives of America. Type species: *Mentzelia aspera* L.

1. *Mentzelia aspera* L. Sp. Pl. 516. 1753.

Straggling, branched, scabrous-pubescent, the stems terete, slender, 1-2 m. long. Leaves hastate, lanceolate or triangular-ovate, slender-petioled, unequally serrate or incised, membranous, 8 cm. long or less, the apex acuminate, the base narrowed or subtruncate; flowers solitary or few, light yellow, 1.5-2 cm. broad; calyx-lobes 5, linear-lanceolate, acuminate, about 8 mm. long; petals oval, longer than the calyx-lobes; stamens about 20, capsule linear-clavate, 2-3 cm. long.

Rocky soil, dry southern districts and near Rincon, Porto Rico.—Cuba; Jamaica; Hispaniola; St. Lucia (ex Urban); Bonaire; Curaçao; Aruba; continental tropical America. PEGADORA.

Loasa triloba Juss., a Peruvian species, was listed by Krebs as found in St. Thomas; it may have been planted there.

Order 22. OPUNTIALES.

Fleshy plants, with continuous or jointed stems, mostly leafless or with small leaves, generally abundantly spiny, the spines developed from cushions of hairs (areolae). Flowers mostly solitary and sessile, perfect, regular, and showy. Calyx-tube adnate to the ovary, its limb many-lobed. Petals mostly numerous, imbricated in several rows, distinct, or the flower tubular, funnellform or campanulate. Stamens numerous, inserted on the throat of the calyx. Filaments filiform; anthers small. Ovary 1-celled; ovules numerous, anatropous, borne on several parietal placentae. Style terminal, elongated; stigmas or stigma-lobes several or numerous. Fruit a berry, mostly fleshy, sometimes dry. Seeds smooth, or tubercled, the testa usually crustaceous or bony; endosperm little, or copious. Only one family.

Family 1. CACTACEAE Lindl.

CACTUS FAMILY.

Characters of the order. About 125 genera and not less than 1250 species, natives of America.

- | | |
|--|----------------------------|
| A. Leaves broad and flat; glochids none; flowers stalked. | 1. <i>Pereskia</i> . |
| B. Leaves terete, small, or altogether wanting; flowers sessile. | |
| 1. Glochids present; leaves small, terete, deciduous or fugacious; flowers without a tube. | 2. <i>Nopalea</i> . |
| Stamens much longer than the erect petals. | 3. <i>Opuntia</i> |
| Stamens shorter than the spreading petals. | |
| 2. Glochids none; leaves almost always wanting. | |
| a. Perianth funnellform, salverform or campanulate, large, the segments several or many; terrestrial cacti. | |
| * Flowers and spines borne at the same areoles; several-jointed or many-jointed cacti, the joints elongated. | |
| † Erect or arching cacti, without aerial roots. | 4. <i>Cephalocereus</i> . |
| Ovary naked. | |
| Ovary scaly, often also spiny. | |
| Perianth short-campanulate or short-funnelform, its tube short. | 5. <i>Leptocereus</i> . |
| Bushy, tree-like or arching cacti. | 6. <i>Lemaireocereus</i> . |
| Columnar cacti. | |
| Perianth funnellform or salverform, the tube long. | |
| Joints 3-5-angled; areoles of the ovary spiny or bristly. | 7. <i>Acanthocereus</i> . |
| Joints ribbed; areoles of the ovary woolly. | 8. <i>Harrisia</i> . |
| †† Vine-like climbing cacti, with aerial roots. | |
| Ovary and fruit bearing large foliaceous scales, not hairy; joints 3-angled or 3-winged. | 9. <i>Hylocereus</i> . |
| Ovary and fruit without foliaceous scales, bearing tufts of hairs; joints ribbed or angled. | 10. <i>Selenicereus</i> . |

** Flowers and spines borne at different areoles; short or small, 1-jointed cacti, solitary or clustered. Flowering areoles forming a central, terminal, woolly cephalum.

- b. Perianth areoles at the bases of tubercles.
 b. Perianth small, rotate; many-jointed, slender epiphytic cacti.

11. *Cactus*.
 12. *Neomammillaria*.
 13. *Rhipsalis*.

1. **PERESKIA** [Plum.] Mill. Gard. Dict. Abr. ed. 4. 1754.

Shrubs, trees or woody vines, with spines in pairs or in clusters at the leaf-axils, the leaves broad, flat, alternate, somewhat fleshy, deciduous, the rotate flowers solitary or clustered, usually stalked. Glochids none. Spines without sheaths. Sepals and petals few or several, distinct. Stamens many, shorter than the petals. Stigma-lobes linear. Fruit a berry, many-seeded. Seeds black, smooth, shining, with a brittle testa and a strongly curved embryo. [Commemorates Nicolas Claude Fabry de Peiresc, 1580-1637.] About 20 species, of tropical America. Type species: *Cactus Pereskia* L.

A climbing vine, the twigs with a pair of reflexed spines at each areole.
 A shrub, with straight slender spines.

1. *P. Pereskia*.
 2. *P. grandifolia*.

1. **Pereskia Pereskia** (L.) Karst. Deutsch. Fl. 888. 1882.

Cactus Pereskia L. Sp. Pl. 469. 1753.

Pereskia aculeata Mill. Gard. Dict. ed. 8. 1768.

A slender glabrous woody vine, up to 10 m. in length, the twigs bearing paired reflexed spines 5-10 mm. long, the stems with longer acicular spines solitary or clustered. Leaves ovate, oblong or lanceolate, 4-7 cm. long, the apex acute or short-acuminate, the base rounded or narrowed, the petioles short; flowers corymbose or paniculate, often numerous, white, pinkish or yellowish, 2.5-4.5 cm. broad; ovary bearing a few leaf-like scales; fruit globose, yellow or reddish, 1-2 cm. in diameter; seeds few, black.

Spontaneous after cultivation, Porto Rico; Vieques; St. Croix; St. Thomas;—West Indies and continental tropical America; widely cultivated in tropical regions as an ornamental vine and for its fruit; known as BARBADOS GOOSEBERRY and GOOSEBERRY SHRUB.

2. **Pereskia grandifolia** Haw. Suppl. Pl. Succ. 85. 1819.

A shrub or sometimes a small tree, up to 5 m. high, often forming a trunk 1 dm. in diameter and copiously armed with formidable spines, the branches glabrous, elongated, somewhat fleshy, with 1 or 2 acicular spines at the areoles or spineless. Leaves oblong, 8-15 cm. long, acute or obtuse, short-petioled; flowers rose or sometimes white, 3-4 cm. broad, in terminal clusters; fruit pyriform, with many black seeds. [*P. Bleo* of Eggers, of Millspaugh and of Urban, not of de Candolle.]

Spontaneous after cultivation, Porto Rico; St. Croix; St. Thomas; commonly planted in Porto Rico and Virgin Island gardens. Widely planted as an ornamental shrub, and for hedges in tropical regions. Native of Brazil. HORTENSIA.

Pereskia saccharosa Griseb., Argentinian, grown by Mr. A. S. Fairchild at Louisenhøj, St. Thomas, forms a small tree, the branches bearing straight slender spines, the leaves lanceolate to oblanceolate, 12 cm. long or less, the rose-colored flowers about 6 cm. wide, the outer sepals bearing long hairs.

2. **NOPALEA** Salm-Dyck, Cact. Hort. Dyck. 1849. 63. 1850.

Branched cacti with erect, cylindric trunks, the branches composed of one or several flat fleshy joints. Areoles unarmed or spiny, mostly with few glochids.

Leaves small, subterete, deciduous. Flowers solitary and sessile at areoles near or along the edges of the joints; sepals ovate, erect; petals red or pink, erect, appressed against the numerous erect stamens; filaments and style much longer than the petals; ovary umbilicate. Fruit a juicy berry. Seeds arillate. [From the Mexican name nopal.] About 8 species of Mexico and Central America, the following typical.

1. **Nopalea cochenillifera** (L.) Salm-Dyck, Cact. Hort. Dyck. 1849. 64. 1850.

Cactus cochenillifer L. Sp. Pl. 468. 1753.

Opuntia cochenillifera Mill. Gard. Dict. ed. 8. 1768.

Erect, at first simple, at length usually much branched, 2-4 m. high, bright green, the trunk 1-2 dm. in diameter, usually unarmed. Joints oblong, 1.5-5 dm. long, spineless or nearly so; areoles bearing deciduous glochids and small subulate deciduous leaves; flowers often numerous, about 5 cm. long; ovary globose, about 2 cm. long, low-tuberculate; sepals scarlet; petals scarlet, a little longer than the sepals; stamens pinkish, about twice as long as the petals; style longer than the stamens, the stigma 6-7 lobed; berry red, about 5 cm. long.

Locally persistent or spontaneous after planting in the southern dry districts of Porto Rico; St. Croix; St. Thomas:—Widely planted for use in poultices and locally spontaneous in tropical America, its native home unknown. This is the plant illustrated by Cook and Collins on Plate 48 "Economic Plants of Porto Rico." TUNA DE ESPAÑA. TUNA MANSA. COCHINEAL CACTUS. FRENCH PRICKLY PEAR.

3. **OPUNTIA** [Tourn.] Mill. Gard. Dict. Abr. ed. 4. 1754.

Succulent plants, with jointed branching stems, the joints flat, or cylindrical, and small, mostly subulate, deciduous leaves, the areolae with tufts of glochids and usually spine-bearing. Flowers sessile, usually lateral. Calyx-tube not prolonged beyond the ovary, its lobes spreading. Petals numerous, slightly united at the base. Stamens very numerous. Ovary cylindrical, exserted; style cylindrical, longer than the stamens; stigma 2-7-rayed. Berry globose to obovoid, often spiny. [Named from a town in Greece where some species grew.] About 250 species, natives of America. Type species: *Cactus Opuntia* L.

Plants low, spreading or bushy, branching at or near the base; flowers large.

Joints small, readily detached; plants spreading.

Joints oblong, 4 cm. wide or less, very fragile.

Joints 4-8 times as long as wide; spines 1-3 cm. long.

Joints 2-3 times as long as wide; spines 3-5 cm. long.

Joints oblong to obovate, larger, less fragile.

Spines white.

Spines yellow, at least when young.

Joints large, not readily detached; plants bushy.

Spines yellow.

Plant spineless or with a few white spines.

Plants tall, erect, with a continuous trunk; flowers small, the branches flat, in a terminal crown.

Joints strongly areolate; ovary prominently tubercled.

Joints indistinctly areolate; ovary low-tubercled.

1. *O. repens*.

2. *O. borinquensis*.

3. *O. triacantha*.

4. *O. antillana*.

5. *O. Dillenii*.

6. *O. Ficus-indica*.

7. *O. moniliformis*.

8. *O. rubescens*.

1. **Opuntia repens** Bello, Anal. Soc. Esp. Hist. Nat. 10: 277. 1881.

Usually much-branched, often forming dense low colonies up to 4 m. in diameter and not over 3 dm. high, sometimes erect or ascending and 5 dm. high. Joints readily detached, light green to olive-green, glabrous or puberulent, oblong to linear, 5-16 cm. long, 2-3.5 cm. wide, flat or somewhat turgid; areoles small, bearing wool, several spines and ultimately numerous glochids; spines acicular, pinkish when young, fading brown or whitish; leaves very small; flowers few, bright yellow, fading to salmon, about 4 cm. broad; berry red, spiny or spineless, obovoid, 2-3 cm. long, with 1 seed or few. [*Cactus curassavicus* of West, not

of Linnaeus; *Opuntia curassavica* of Krebs, of Eggers, of Millspaugh and of Schumann, not of Miller; ? *O. pusilla* of Krebs; *O. decumbens* of Cook and Collins.]

Plains, sand-dunes and hillsides along and near the southern coast of Porto Rico, from the vicinity of Aguirre, westward; Mona; Muertos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda. Endemic. Britton and Rose referred the Culebra plant, when it was first known to them, to *O. curassavica*, and Britton referred the Mona plant, when first known, to *O. Taylori* of Hispaniola. The joints fall apart readily and are distributed by animals to which they become attached, and by the wind. OHULAGA. OLAGA. SUCKERS.

2. **Opuntia borinquensis** Britton & Rose, *Cactaceae* 1: 103. 1919.

Sparingly branched, but forming colonies up to 2 m. broad, 5 dm. high or less. Joints readily detached, dull green, oblong or oblong-obovate, compressed, but turgid, 5-8 cm. long, 4 cm. wide or less; areoles small; spines 2 or 3, acicular, 3-6 cm. long, brown, fading white; leaves subulate, 1-2 mm. long; fruit obovoid, subtruncate, about 1.5 cm. long.

Known only from a limestone swale at Morillos de Cabo Rojo, where it grew with *O. repens*. Endemic.

3. **Opuntia triacantha** (Willd.) Sweet, *Hort. Brit.* 172. 1826.

Cactus triacanthos Willd. *Enum. Suppl.* 34. 1813.

Prostrate and clambering, or ascending, or erect, about 6 dm. high or less, usually few-branched. Joints compressed, turgid, oblong to oval, 4-8 cm. long, mostly about half as wide as long, the upper ones rather readily detached; spines about 3, acicular, 4 cm. long or less, white, or yellowish-white; flowers 5-6 cm. wide, yellowish or cream-color tinged with pink, the petals obtuse; fruit 2-3 cm. long, spineless.

Coastal rocks, Punta Melones, Porto Rico; rocky hillsides, Desecheo; Buck Island, St. Thomas;—St. Martin to St. Kitts and Guadeloupe.

4. **Opuntia antillana** Britton & Rose; Britton, *Mem. Brooklyn Bot. Gard.* 1: 74. 1918.

Usually much branched, sometimes forming clumps a meter broad, prostrate or ascending, 6 dm. high or less. Joints obovate or oblong-obovate, flat, 7-20 cm. long, the terminal ones rather readily detached; areoles large, brown-woolly, with yellow glochids and 3-6 rather stout unequal yellow spines 1-6 cm. long; spines fading to gray or white; flowers yellow, or reddish, 5-7 cm. broad, the petals obovate, obtuse; fruit obovoid, red-purple, about 4 cm. long. [*O. polyantha* of Krebs, not of Haworth.]

Plains near the southern coast of Porto Rico from the vicinity of Salinas, westward; St. Croix; St. Thomas; Tortola;—Hispaniola; St. Kitts. BULL SUCKERS.

5. **Opuntia Dillenii** (Ker-Gawl.) Haw. *Suppl. Pl. Succ.* 79. 1819.

Cactus Dillenii Ker-Gawl. *Bot. Reg.* 3: pl. 255. 1818.

Opuntia horrida Salm-Dyck; *DC. Prodr.* 3: 472. 1828.

Bushy-branched, 0.5-1.8 m. high, often forming masses 2 m. in diameter. Joints green, glabrous, mostly obovate and 1-2.5 dm. long, about 8 mm. thick, not readily detached, crenate, the areoles 2-6 cm. apart, somewhat elevated, bearing 1-4, stout, somewhat flattened, yellow spines 1-4 cm. long, or spineless, the numerous glochids yellowish to brownish, 6 mm. long or less; flowers often abundant, bright yellow, or orange, about 7.5 cm. broad; ovary obovoid, with glochid-bearing areoles; petals obovate; fruit pyriform, red or purple, edible, 5-8 cm. long. [*Cactus Opuntia* of West, not of Linnaeus; *Opuntia Tuna* of

Eggers, of Millspaugh, of Stahl and of Urban, not of Miller; *O. vulgaris* of Krebs, not of Miller.]

Coastal sands and rocks, Porto Rico, locally extending a few miles inland in the dry southern districts; Mona; Icaos; Vieques; St. Croix; St. Thomas; St. Jan.—Florida; Bermuda; West Indies; eastern coasts of Mexico; northern South America. Races differ in habit, in armament, in shape of joints and in color of flowers. A hybrid with *O. rubescens* was observed on Buck Island, St. Thomas. TUNA BRAVA. PRICKLY PEAR.

6. **Opuntia Ficus-indica** (L.) Mill. Gard. Dict. ed. 8. 1768.

Cactus Ficus-indica L. Sp. Pl. 468. 1753.

Usually much branched, nearly or quite unarmed, often with a definite jointed trunk up to 4 or 5 m. high. Joints oblong to elliptic or obovate-elliptic, flat, rather thick, 2–6 dm. long and about half as wide as long; areoles small, the glochids yellow; spines, when present, few, weak, white, 2 cm. long or less; leaves subulate, about 3 mm. long or less; flowers bright yellow, 7–10 cm. broad, fruit red or yellow, obovoid, 5–9 cm. long, with small distant spinelss areoles.

Spontaneous after planting in the dry southern districts of Porto Rico; planted in the Virgin Islands.—Widely planted in tropical and subtropical regions for its fruits and for forage, its original home unknown. TUNA. INDIAN FIG.

7. **Opuntia moniliformis** (L.) Haw.; Steud. Nom. ed. 2, 2: 221. 1841.

Cactus moniliformis L. Sp. Pl. 468. 1753.

Cactus ferox Willd. Enum. Suppl. 35. 1813.

Opuntia ferox Haw. Suppl. Pl. Succ. 82. 1819.

Tree-like, with a somewhat flattened, densely spiny, unjointed, erect trunk sometimes 4 m. high, the yellowish or gray spines sometimes 12 cm. long, and widely spreading branches. Joints flat, thin, oblong to obovate, 1–3 dm. long, 7–13 cm. wide, obtuse, distinctly areolate-reticulate; areoles a little elevated, with brown glochids, those of the young joints spineless or sparingly spiny, those of the old joints with 3–8 yellowish spines; flowers about 2.5 cm. broad; petals yellow or orange, spreading; stamens much shorter than the petals; ovary cylindrical, nearly terete, spineless; fruits and small joints are readily detached, and falling to the ground, strike roots and proliferate, forming clumps of subglobose or oblong joints.

On rocks and rocky hillsides, Desecho:—Hispaniola.

8. **Opuntia rubescens** Salm-Dyck; DC. Prodr. 3: 474. 1828.

Opuntia catacantha Link & Otto; Pfeiff. Enum. Cact. 166. 1837.

Consolca rubescens Lam. Rev. Hort. 1862: 174. 1862.

Consolca catacantha Lem. Rev. Hort. 1862: 174. 1862.

Opuntia guanicana Schum.; Gurke, Mon. Kak. 18: 180. 1908.

Tree-like, very spiny or quite unarmed, the continuous unjointed trunk 3–6 m. high, terete below, flattened above, the branches ascending. Joints flat, thin, dark green or reddish green, oblong to obovate-oblong, 1–2.5 dm. long; areoles with 1–6 acicular, nearly white spines or spineless, the glochids brownish; flowers yellow or orange or red, about 2 cm. broad; ovary long-tuberculate, 4–5 cm. long; petals obovate, apiculate, spreading, about twice as long as the stamens; fruit obovoid to subglobose, 5–8 cm. in diameter, spiny or spineless. Like the preceding species this bears proliferating ovaries, which falling to the ground and striking roots, produce new plants. [*O. spinosissima* of Eggers and of Krebs, not of Miller; *O. tuberculata* of Eggers; *O. ferox* of Bello, not of Haworth.]

Plains and hillsides, dry southwestern districts of Porto Rico at low elevations; Mona; Icaos; Vieques; Culebra; St. Croix; St. Thomas; St. Jan; Tortola.—St. Martin to Guadeloupe.

Opuntia Lindheimeri Engelm., Texan, a bushy species with large joints, slender yellow spines and large yellow flowers has been grown by Mr. Fairchild at Louisenhöj, St. Thomas.

Opuntia vulgaris Mill. [*O. monocantha* Haw.], of southeastern South America, occasionally planted in Porto Rico and the Virgin Islands, is a tall species, with large ovate to oblong, bright green and shining joints, armed with long brown spines, the yellow or reddish flowers about 7 cm. broad.

4. **CEPHALOCEREUS** Pfeiffer, Allg. Gartenz. 6: 142. 1838.

[*PILOCEREUS* Lemaire, Cact. Gen. Nov. & Spec. 6. 1839.]

Large, simple or branched, erect, columnar cacti, the joints leafless, elongated, ribbed and grooved, the upper areoles often densely lanate or long-bristly. Flowers solitary at upper areoles, nocturnal, fleshy, rather small, the tube short-funnelform or campanulate, the segments not very widely expanding; ovary subglobose, naked or bearing a few scales, spineless; style usually short-exserted. Fruit a globose or depressed-globose smooth berry; seeds small and numerous, black or brown. [Greek, head-Cereus.] Forty species or more, of tropical and subtropical America. Type species: *Cactus senilis* Haw.

Stems stout, green or bluish-green, glaucous, at least when young.
Stems slender, dark green, not glaucous.

1. *C. Royeni*.
2. *C. nobilis*.

1. **Cephalocereus Royeni** (L.) Britton & Rose, Contr. U. S. Nat. Herb. 12: 419. 1909.

Cactus Royeni L. Sp. Pl. 467. 1753.

Cereus Royeni Mill. Gard. Dict. ed. 8. 1768.

Cereus floccosus Otto; Pfeiff. Enum. Cact. 81. 1837.

Cereus armatus Otto; Pfeiff. Enum. Cact. 81. 1837.

Pilocereus floccosus Lem. Ill. Hort. 13: under pl. 470. 1866.

Cereus leiocarpus Bello, Anal. Soc. Esp. Hist. Nat. 10: 276. 1881.

Pilocereus Royeni Rümpl.; Foerst. Handb. ed. 2, 682. 1885.

Pilocereus Fouchianus Weber; Gosselin, Bull. Mus. Hist. Nat. Paris 10: 386. 1904.

Cereus Fouchianus Vaupel, Mon. Kak. 23: 25. 1913.

Branching above or from near the base, 2-8 m. high, the short trunk up to 3 dm. in diameter, the branches stout, erect or ascending, 8-15 cm. in diameter, green to blue, glaucous, at least when young. Ribs 7-11, prominent; areoles many, softly woolly, close together; spines acicular, yellow, fading gray, 1-6 cm. long; flowering areoles with conspicuous tufts of long white wool; flowers exteriorly greenish yellow or purplish, about 5 cm. long; inner perianth-segments nearly white, acute; fruit depressed, green or reddish, about 5 cm. in diameter, the pulp red, the seeds black and shining. [*Cereus peruvianus* of West, not of Miller; *C. Swartzii* of Stahl, not of Grisebach; *Pilocereus lanuginosus* of Schumann, not of Rümpler; *Cereus lanuginosus* of Krebs, not of Haworth.]

Plains and hills at lower elevations, southern and southwestern dry districts of Porto Rico; Desecheo; Mona; Icacos; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—St. Kitts; Antigua. SEBUCAN. DILDO.

2. **Cephalocereus nobilis** (Haw.) Britton & Rose, Contr. U. S. Nat. Herb. 12: 418. 1909.

Cactus nobilis Haw. Syn. Pl. Succ. 179. 1812.

Cactus strictus Willd. Enum. Suppl. 32. 1813. Not Haw. 1803.

Cereus strictus DC. Prödr. 3: 465. 1828.

Pilocereus strictus Rümpl.; Foerst. Handb. ed 2, 687. 1885.

Dark green when growing in shade, lighter green when in the sun, not glaucous, much branched, spreading, rather weak, the branches erect or ascending,

slender, 5-7 cm. thick. Ribs 8-10, rather prominent; areoles close together, slightly hairy; spines acicular, 1-3.5 cm. long, yellow, fading brown; flowering areoles with tufts of short white wool; flowers 4-6 cm. long, purple outside; outer perianth-segments rounded or acutish, the inner acute, light purple; fruit depressed-globose.

Banks and hillsides, St. Thomas, persistent or spontaneous after cultivation.—St. Kitts to Grenada. Urban doubtfully recorded this species from the vicinity of Guanica, Porto Rico, after studying a flower collected by Sintenis; we found only *C. Royeni* in that region after long search. DILDO.

5. **LEPTOCEREUS** [Berger] Britton & Rose, Contr. U. S. Nat. Herb. 12: 433. 1909.

Bushy, arborescent, vine-like or arching, spiny, many-jointed cacti, the joints mostly elongated, thin-ribbed or angled; leaves none; no aerial roots. Flowers rather small, diurnal; ovary with numerous spiny areoles; perianth-tube short, campanulate, spiny, the segments white, spreading; stamens very numerous, scarcely exerted; stigma-lobes somewhat exceeding the stamens. Fruit globose to oblong or obovoid, fleshy, spiny or at length smooth. Seeds black, numerous. [Greek, thin-Cereus, referring to the thin ribs.] Eight known species, natives of Cuba, Hispaniola and Porto Rico. Type species: *Cereus assurgens* Griseb.

1. **Leptocereus quadricostatus** (Bello) Britton & Rose, Contr. U. S. Nat. Herb. 16: 242. 1913.

Cereus quadricostatus Bello, Anales Soc. Esp. Hist. Nat. 10: 276. 1881.

Bushy-branched, 2-4 m. high, sometimes forming thickets, the branches spreading or arching, often elongated. Joints dark green, 2-7 dm. long, 4-6 cm. thick, 3-5-ribbed (mostly 4-ribbed), the ribs low, thin; spines several at each areole, acicular, grayish, 1-6 cm. long; flowers about 4 cm. long, 2 cm. broad, the outer segments green, the inner greenish or yellowish-white, truncate, with an erose apex; areoles of the ovary and flower-tube with a few short spines; style and filaments greenish; fruit subglobose or obovoid, 3-5 cm. long, at length smooth.

Plains and hills at low elevations, southern and southwestern dry districts of Porto Rico; Icacos. Endemic. SEBUCAN. PITAJAYA.

6. **LEMAIREOCEREUS** Britton & Rose, Contr. U. S. Nat. Herb. 12: 424. 1909.

Mostly tall stout cacti, with ribbed spiny stems and branches, the spines several or numerous at the felted areoles; leaves none. Flowers diurnal, tubular-funnelform to campanulate with a short tube; stamens very numerous; ovary tubercled, bearing scales, its areoles at first usually spineless, but later developing a cluster of spines. Fruit globular to oval, irregularly bursting when old, spiny, or often nearly or quite spineless when mature. Seeds numerous, black. [Commemorates Charles Lemaire, 1801-1871, distinguished French horticulturist.] About 21 species, natives of the southwestern United States, Mexico, the West Indies and continental tropical America. Type species: *Cereus Hollianus* Weber.

1. **Lemaireocereus hystrix** (Haw.) Britton & Rose, Contr. U. S. Nat. Herb. 12: 425. 1909.

Cactus hystrix Haw. Suppl. Pl. Succ. 73. 1819.

Cereus hystrix Salm-Dyck, Obs. Bot. 3: 7. 1822.

Branched from the base, or with a short trunk up to 3 dm. in diameter, the branches several or many, erect or ascending, 4-6 m. high, 7-10 cm. thick, green

or grayish green. Ribs 9-12, rather narrow; spines several, acicular, gray with brownish tips, 1-4 cm. long; flowers about 9 cm. long, about 3 cm. broad, purple or green, the inner segments white, recurved or spreading, the tuberculate ovary bearing small scales; fruit ellipsoid or subglobose, 5-6 cm. long, scarlet, with clusters of deciduous spines, at length breaking open, its pulp red.

Rocky slopes, Desecheo: Muertos:—Cuba; Jamaica; Hispaniola. SPANISH DILDO.

7. **ACANTHOCEREUS** [Berger] Britton & Rose, Contr. U. S. Nat. Herb. **12**: 432. 1909.

Elongated, many-jointed, leafless cacti, arching or clambering, the joints 3-7-angled, the areoles with felt or wool and several spines; aerial roots none. Flowers funnellform, nocturnal, 1 at an areole, withering-persistent, the tube mostly as long as the limb or longer, the numerous segments widely spreading; ovary and flower tube bearing a few clusters of spines, subtended by scales; outer perianth-segments green, shorter than the white inner ones; stamens many; style slender; stigma-lobes several. Fruit fleshy, bursting. Seeds black, numerous. [Greek, thorn-Cereus.] Eight known species of tropical and subtropical America, the following typical.

1. **Acanthocereus pentagonus** (L.) Britton & Rose, Contr. U. S. Nat. Herb. **12**: 432. 1909.

Cactus pentagonus L. Sp. Pl. 467. 1753.

Often rooting at the tip and forming colonies, the joints 3-5-angled, low-crenate, the areoles rather distant, bearing 6-12, acicular or subulate, gray spines 1-5 cm. long; flowers solitary, 14-20 cm. long, the areoles of the ovary and tube felted and with several acicular spines; inner perianth-segments linear-oblong, acuminate, 4-6 cm. long; fruit red, oblong, 5-7 cm. long.

On banks, persistent after planting and forming thickets on St. Croix and St. Thomas:—Texas; Mexico to Panama and Venezuela; Trinidad; Guadeloupe.

S. **HARRISIA** Britton, Bull. Torr. Club **35**: 561. 1908.

Night-flowering cacti, mostly with upright branched cylindrical stems, the branches fluted, with from 8-10 rounded ribs, separated by shallow grooves and bearing areoles at frequent intervals, each areole with acicular spines. Flowers borne singly, at areoles near the ends of the branches, funnellform, large, with a cylindrical scaly but spineless tube as long as the limb or longer; buds globose, ovoid, or obovoid, densely scaly, the scales subtending long or short woolly hairs; style somewhat longer than the stamens; fruit globose to ovoid-globose, tubercled or becoming smooth, spineless, with mostly deciduous scales; corolla withering-persistent; seeds very numerous, small. [In honor of William Harris, 1860-1920, Superintendent of Public Gardens and Plantations of Jamaica, distinguished for his contributions to the knowledge of the flora of that island.] About 17 species, natives of Florida and tropical America. Type species: *Cereus gracilis* Mill.

1. **Harrisia portoricensis** Britton, Bull. Torr. Club **35**: 563. 1908.

Cereus portoricensis Urban, Symb. Ant. **4**: 430. 1910.

Slender, nearly erect, little-branched, 2-3 m. high. Joints 3-4 cm. thick, about 11-ribbed, the ribs rounded; spines 13-17 at each areole, grayish white or

brown with darker tips, 3 cm. long or less; flower-bud obovoid, white-hairy; flowers about 15 cm. long; scales of the flower-tube lanceolate, 1.5 cm. long, subtending a tuft of white hairs; outer perianth-segments pinkish green within, the inner ones white, 5-6 cm. long; fruit ovoid to globose, yellow, tubercled but becoming nearly smooth, 4-6 cm. thick. [*Cereus criophorus* of Urban, not of Pfeiffer.]

Thickets near the southern coast near Ponce and Tallaboa; Mona. Endemic.

9. **HYLOCEREUS** [Berger] Britton & Rose, Contr. U. S. Nat. Herb. 12: 428. 1909.

Climbing or trailing cacti, with 3-winged or 3-angled, mostly stout stems and branches emitting aerial roots, but bearing no leaves, the areoles borne on the wings or angles and armed with few or several short spines. Flowers nocturnal, very large, regular, the ovary and tube bearing large, ovate to linear-lanceolate scales, without spines or hairs, the perianth-segments numerous, linear or narrowly lanceolate, widely spreading, the outer green, the inner mostly bright white. Stamens very many. Fruit a scaly berry, not spiny nor bristly. [Greek, forest-Cereus.] About 18 species, natives of tropical America. Type species: *Cereus triangularis* L.

Joints horny-margined, the ribs thin, broad, crenate.
Joints not horny-margined, the ribs thick, tubercled.

- 1. *H. undatus*.
- 2. *H. trigonus*.

1. **Hylocereus undatus** (Haw.) Britton & Rose; Britton, Fl. Berm. 256. 1918.

Cereus undatus Haw. Phil. Mag. 7: 110. 1830.

Cereus tricostatus Gosselin, Bull. Soc. Bot. France 54: 664. 1907.

Stems stout, fleshy, glabrous, sometimes 7 m. long, often climbing on trees, the joints 3-12 dm. long, green, 3-winged, the wings flat, 1-2.5 cm. broad, coarsely crenate, their margins with a narrow horny border; spines 2-5 at each areole, brownish, 3-4 mm. long; flowers about 3 dm. long, the tube about 3 cm. thick, rather shorter than the limb, bearing several linear-lanceolate scales 3-8 cm. long; ovary 2.5-5 cm. long, bearing several ovate acute scales 2.5 cm. long or less; style stout, about as long as the stamens; berry oblong, red, pulpy, about 8 cm. long, covered with ovate scales. [*Cereus triangularis* of Bello and of Urban, not of Haworth.]

Persistent after cultivation, St. Croix and St. Thomas.—Widely distributed by cultivation in tropical and subtropical regions; occasionally planted in Porto Rico gardens. Native of Mexico. PITAJAYA. NIGHT-BLOOMING CEREUS.

2. **Hylocereus trigonus** (Haw.) Safford, Ann. Rep. Smiths, Inst. 1908: 556. 1909.

Cereus trigonus Haw. Syn. Pl. Succ. 181. 1812.

Cereus venditus Paulsen, Journ. Bot. 56: 235. 1918.

Slender, often much branched, glabrous, up to 10 m. long, green. Joints 2-3 cm. broad, 3-angled, not horny-margined, strongly undulate-tuberculate; spines about 8 at an areole, 4-7 mm. long, greenish, turning dark brown, often with 2 accessory bristles; flowers similar to those of the preceding species; fruit oblong or oblong-obovoid, red, about 10 cm. long, at first scaly, at length nearly smooth. [*Cereus triangularis* of West, of Krebs and of Eggers; at first referred to *Hylocereus Lemairei* by Britton and Rose.]

On rocks and on trees at lower elevations, Porto Rico, in moist and dry districts; Culebra; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda.—Hispaniola; recorded from St. Martin, Saba and St. Eustatius. PITAJAYA. NIGHT-BLOOMING CEREUS. STRAWBERRY PEAR.

Hylocereus costaricensis (Weber) Britton & Rose, Costa Rican, sent to Louisenhøj, St. Thomas, by Dr. J. N. Rose in 1921, and well established there in the spring of 1923, has very large stems up to 10 cm. broad, bluish green or nearly white, bearing short conic spines, the margins thin, the fragrant flowers about 3 dm. long. [*Cereus costaricensis* Weber.]

Hylocereus guatemalensis (Eichlam) Britton & Rose, Guatemalan, also sent by Dr. Rose to Louisenhøj in 1921, and established, has smaller stems with short conic spines, the joints glaucous, their margins horny, the flowers about as large. [*Cereus guatemalensis* Eichlam.]

10. **SELENICEREUS** [Berger] Britton & Rose, Contr. U. S. Nat. Herb. 12: 429, 1909.

Climbing or trailing, vine-like cacti, the joints several-ribbed, fluted or angled, giving off aerial roots, the large funnellform flowers nocturnal; the stem-areoles bearing conic or acicular spines. Ovary and flower-tube bearing small scales, usually with long hairs and bristles in their axils. Perianth-segments numerous, narrow, spreading or recurved, the inner white. Stamens numerous. Fruit a globose or ovoid berry, usually large, bearing clusters of deciduous spines. [Greek, moon-Cereus.] About 16 species, natives of tropical America. Type species: *Cactus grandiflorus* L.

1. ***Selenicereus grandiflorus*** (L.) Britton & Rose, Contr. U. S. Nat. Herb. 12: 430. 1909.

Cactus grandiflorus L. Sp. Pl. 467. 1753.

Cereus grandiflorus Mill. Gard. Dict. ed. 8, no. 11. 1768.

Stems light green to deep purple, up to 3 cm. in diameter; ribs 5-8, rather prominent; areoles small, white; spines acicular, 1 cm. long or less, yellowish; deflexed bristles or hairs from the lower part of the areoles several, white, often longer than the spines; flowers 2 dm. long; outer perianth-segments and scales of the tube linear, greenish or brownish, sometimes nearly rose-colored, with tufts of brown hairs in their axils; inner perianth-segments acute, rather broad; style cream-colored, stout; areoles of ovary and flower-tube bearing short wool and long silky hairs and white bristles; ovary tubercled; fruit ovoid, about 8 cm. long.

Persistent after cultivation, St. Croix; St. Thomas; Tortola; planted in Porto Rico gardens; widely planted and escaped from cultivation in tropical America. Native of Jamaica and Cuba, perhaps of Hispaniola. REINA DE LA NOCHE. QUEEN OF THE NIGHT.

Selenicereus pteranthus (Link & Otto) Britton & Rose, FLOR DE MAYO, native of Mexico, a related species, has stout angled bluish green to purple stems and branches, armed with conic spires only 1-3 mm. long. It has been planted in Porto Rico, and the Virgin Islands, and was recorded by Dr. Millspaugh as naturalized on old garden walls as Bassin, St. Croix. [*Cereus pteranthus* Link & Otto; *C. nycticalus* Link.]

Selenicereus Urbanianus (Guerke & Weingart) Britton and Rose, grown by Mr. Fairchild at Louisenhøj, St. Thomas, native of Cuba and Hispaniola, differs from *S. grandiflorus* in having the hairs on the flower-areoles bright white. [*Cereus Urbanianus* Guerke & Weingart.]

Selenicereus inermis (Otto) Britton & Rose, Venezuelan, also in Mr. Fairchild's collection, is a slender vine with 3-5-ribbed joints, the ribs undulate nearly unarmed; its flowers are about 15 cm. long, the ovary spiny. [*Cereus inermis* Otto.]

Selenicereus Boeckmannii (Otto) Britton & Rose, also grown by Mr. Fairchild, resembles *S. pteranthus*, but has slender stems, the hairs of the flower-areoles brown; it is indigenous in Hispaniola, Cuba and eastern Mexico. [*Cereus Boeckmannii* Otto.]

11. **CACTUS** L. Sp. Pl. 466. 1753.

Subglobose ovoid or short-cylindric, ribbed leafless cacti, the spine-bearing areoles borne on the ribs, the flowering areoles confluent into a terminal, densely woolly and bristly cephalium. Flowers with a cylindric tube, sometimes enlarged at the base, the limb several-lobed, the lobes imbricated. Stamens several or numerous, the filaments capillary, the anthers oblong. Ovary smooth; style filiform; stigma-rays few or many; ovules many. Fruit an obovoid or subclavate, naked fleshy and juicy berry, protruded from the cephalium, crowned by the withering perianth. Seeds many, small, black, without endosperm. [A Greek name for thistle.] About 20 species, natives of tropical America. Type species: *Cactus Melocactus* L.

1. **Cactus intortus** Mill. Gard. Dict. ed. 8, no. 2. 1768.

Melocactus atrosanguineus Pfeiff. Enum. Cact. 44. 1837.

Melocactus portoricensis Suringar, Versl. Med. Akad. Wetsch. III 9: 408. 1891.

Plant depressed-globose when young, when old ovoid, 3-7 dm. high and often 3 dm. in diameter, rather light dull green, 15-20-ribbed, the ribs 2-4 cm. high, crenate, the areoles bearing 7-13, stout subulate spines 1.5-7 cm. long; cephalium at first nearly flat, at length cylindric, about 10 cm. in diameter, sometimes 3 dm. high, densely white-woolly and brown-bristly; flowers pink or rose, 1-1.6 cm. long; inner perianth-segments acute or cuspidate; fruit red or rose, narrowly obovoid, 2-2.5 cm. long. [*Melocactus communis* of Eggers, of Krebs, of Bello, of Stahl and of Urban; *Cactus Melocactus* of West, not of Linnaeus.]

Rocky and sandy places at low elevations in the dry southwestern districts of Porto Rico near the coasts, and recorded as formerly existing at El Fuerte on the Coamo River, but not found there in 1922; Desecheo; Mona; Vieques; St. Croix; St. Thomas; St. Jan; Tortola; Virgin Gorda; Anegada;—Bahamas; St. Martin to Antigua. Frequently planted in Porto Rico and the Virgin Islands. Races differ in number of ribs and length of spines. Plants with very long spines grow on Mona and Desecheo. MELON DE COSTA. TURK'S-CAP. TURK'S-HEAD.

12. **NEOMAMMILLARIA** Britton & Rose, Cactaceae 4: 65. 1923.

Stems globose or ovoid, tubercled. Tubercles conic or cylindric, woolly and with clusters of spines at the apex. Leaves none. Flowers borne in areoles at the bases of the tubercles. Calyx-tube prolonged beyond the ovary, which is often hidden between the tubercles. Ovary smooth, ovoid; style filiform. Berry emersed, crowned by the withering corolla. [Greek, new-*Mammillaria*.] About 150 species, natives of warm and tropical America. Type species: *Cactus mammillaris* L.

1. **Neomammillaria nivosa** (Link) Britton & Rose, Cactaceae 4: 71. 1923.

Mammillaria nivosa Link; Pfeiff. Enum. 11. 1837.

Cactus nivosus Kuntze, Rev. Gen. Pl. 259. 1891.

Coryphantha nivosa Britton, Annals Mo. Bot. Gard. 2: 45. 1915.

Plants globose or globose-oblong, solitary or tufted, becoming 10-12 cm. in diameter, and sometimes 1.5 dm. long. Tubercles many, dull green, oblong-

conic, 1–1.5 cm. high, obtuse; areoles bearing several yellow or yellowish brown, acicular spines 2 cm. long or less, and when young, tufts of bright white wool; flowers cream-color, about 1 cm. broad; perianth-segments acute or acuminate; berry obovoid or oblong-obovoid, obtuse, 1–1.5 cm. long, red.

On rocks and cliffs, Mona; Culebra; Buck Island and Flat Cays; St. Thomas; St. Jan; Little St. James Island; Tortola.—Bahamas; Antigua. WOOLLY NIPPLE-CACTUS. SNOW CACTUS.

13. *RHIPSALIS* Gaertn. Fr. & Sem. 1: 137. 1788.

Epiphytic or saxicolous cacti, much branched and several-many-jointed, the joints terete, angled or flat, often developing aerial roots; leaves none, represented by scales subtending the areoles. Areoles small, naked, woolly or hairy, in some species bearing bristles. Flowers small, mostly 1 at an areole, rotate, the segments distinct, spreading; filaments few or several, erect; style slender, erect; stigma several-lobed. Fruit a small berry, containing few or many small seeds. [Greek, wicker work.] About 57 species, of tropical regions, mostly American, the following typical.

1. *Rhipsalis Cassutha* Gaertn. Fr. & Sem. 1: 137. 1788.

Rhipsalis parasitica Haw. Syn. Pl. Succ. 187. 1812.

Hariota parasitica Kuntze, Rev. Gen. Pl. 262. 1891.

Pendent, often much branched, becoming 4 m. long or longer, forming festoons. Joints cylindrical, terete, 3–6 mm. thick, smooth, or when young bearing a few short bristles at the areoles, mostly opposite or verticillate; flowers solitary at upper areoles; petals whitish, only about 2 mm. long; stamens few; berry globose, white, about 5 mm. in diameter.

On trees, rarely on cliffs, Porto Rico, at middle altitudes in moist districts; St. Thomas (ex Krebs).—Florida; Jamaica; Cuba; Hispaniola; Tobago; Trinidad; Margarita; continental tropical America; Ceylon; tropical Africa. STRING-CACTUS.

***Cereus hexagonus* (L.) Mill.** TALL COLUMNAR *CEREUS*, native of Trinidad, Tobago and northern South America, is occasionally planted in Porto Rico and the Virgin Islands. It is columnar, more or less branched, up to 15 meters high, with a trunk sometimes 3 or 4 dm. in diameter, the branches usually 6-angled or 6-ribbed, the spines up to 6 cm. long, the ribs thin and flat, the showy white flowers 2–2.5 dm. long. [*Cactus hexagonus* L.; *Cereus Northumberlandianus* Lamb.; *Cereus lepidotus* Salm-Dyck; ? *Cereus eriophorus* of Stahl.] It has been mistaken for *Cereus peruvianus* (L.) Mill., which has more numerous, lower and thicker ribs and smaller flowers, and is recorded as formerly planted in Porto Rico, but not seen there by us.

***Epiphyllum Hookeri* Haw.**, FLOR DE RETRATA, occasionally planted in Porto Rico, has numerous flat crenate leafless joints 5–8 cm. wide and white nocturnal flowers, the straight flower-tube about 15 cm. long, the limb 7–8 cm. broad. It is native of Tobago, Trinidad and Venezuela. [*Cereus Hookeri* Link & Otto; *Phyllocactus Hookeri* Link; *Cactus Phyllanthus* of W. Hooker, not of Linnaeus.]

***Epiphyllum oxypetalum* (DC.) Haw.**, Mexican, another flat-jointed cactus, becoming 3 m. long or longer, the joints deeply crenate, acuminate, 10–12 cm. wide, with large, fragrant nocturnal flowers about 2.5 dm. long, the flower-tube bent, the inner segments white, oblong, about 10 cm. long, is occasionally planted in Porto Rico and Virgin Island gardens. [*Cereus oxypetalus* DC.; *Phyllocactus latifrons* Link.]

Mediocactus coccineus (Salm-Dyck) Britton & Rose, South American, grown by Mr. Fairchild at Louisenhöj, St. Thomas, is a vine, clambering or climbing by aerial roots, the joints 3-winged, with short conic spines at the areoles, the white nocturnal flowers nearly 3 dm. long, the ovary tubercled and bearing clusters of short spines. [*Cereus coccineus* Salm-Dyck.]

Order 23. THYMELEALES.

Mostly shrubs or trees, with simple leaves and incomplete flowers. Calyx inferior, 4-5-lobed or entire. Corolla mostly wanting. Stamens twice as many as the calyx-lobes, or fewer. Ovary 1-celled. Ovule 1, anatropous.

Family 1. **THYMELEACEAE** Reichenb.

MEZEREON FAMILY.

Shrubs or trees (rarely herbaceous), with tough inner bark, and entire estipulate leaves. Flowers fascicled, capitate, racemose, or rarely solitary, regular, perfect or dioecious. Calyx-tube cylindric or urn-shaped. Petals none in the following genus. Stamens borne on the calyx, often in two series; anthers erect, 2-celled, the sacs longitudinally dehiscent. Ovary 1-celled, 1-ovuled (2-celled and 2-ovuled in some Asiatic and Australasian genera); ovule pendulous; stigma terminal, mostly capitate. Fruit mostly indehiscent. Seed-coat mostly crustaceous; embryo straight; cotyledons fleshy; endosperm little or none, or copious in some exotic genera. About 37 genera and 425 species, widely distributed, most abundant in Australia and South Africa.

1. **DAPHNOPSIS** Mart. & Zucc. Nov. Gen. & Sp. 1: 65. 1824.

Trees or shrubs, with thin or subcoriaceous leaves, the mostly dioecious flowers in terminal or axillary clusters. Calyx-tube short or slender, that of staminate flowers mostly longer than that of pistillate; lobes or segments 4. Staminate flowers with 8 stamens in 2 sets of 4, borne on the calyx-tube. Pistillate flowers with a sessile ovary; style short; stigma capitate. Fruit indehiscent, baccate or coriaceous. Seeds without endosperm. [Greek, like *Daphne*.] About 30 species, natives of tropical America. Type species: *Daphnopsis brasiliensis* Mart. & Zucc.

Flowers glomerate, or on short peduncles.

Leaves acute or acuminate, glabrous.

Leaves rounded at apex, pubescent beneath.

Flowers paniculate.

1. *D. Philippiana*.

2. *D. Helleriana*.

3. *D. caribaea*.

1. **Daphnopsis Philippiana** Krug & Urban, Bot. Jahrb. 15: 348. 1892.

A shrub, or a small tree up to about 8 m. high, the twigs rather stout, forking. Leaves oblong to elliptic or obovate-oblong, clustered at the ends of the twigs and at the nodes, appearing as if opposite or verticillate, chartaceous, short-petioled, 6-15 cm. long, the apex acute or acuminate, the base narrowed; flowers glomerate, white, fragrant, the clusters few-several-flowered, terminal or also at the nodes, subtended by densely pubescent scales; staminate flowers with a pubescent calyx-tube 6-8 mm. long, its lobes ovate, much shorter; calyx-tube of the pistillate flowers about one-half as long as that of the staminate; fruit ovoid, about 10 mm. long.

Mountain forests of Porto Rico, ascending to higher elevations. Endemic. CIENEGUILLO. MAJAGUA BRAVA. MAJAGUA QUEMADORA.

2. *Daphnopsis Helleriana* Urban, Symb. Ant. **2**: 453. 1901.

A small tree, about 7 m. high, the bark gray, the twigs rather stout, forking, the young ones villous. Leaves clustered at the ends of the twigs or appearing as if opposite, chartaceous, oblong-obovate or oblanceolate, short-petioled, 7–13 cm. long, dark green, glabrous and glaucescent above, pale and somewhat pubescent beneath, rounded or obtuse at the apex, narrowed or subcuneate at the base; staminate flowers pale yellow, glomerate at the end of twigs, about 3 together on a short peduncle, subtended by densely hairy scales, the villous calyx-tube about 9 mm. long, its lobes suborbicular.

Limestone hill near Bayamon, collected only by Heller in 1900. Endemic.

3. *Daphnopsis caribaea* Griseb. Fl. Br. W. I. 278. 1860.

A shrub, or a tree up to 15 m. high, the slender twigs and the leaves glabrous. Leaves alternate, chartaceous, oblong, 6–15 cm. long, reticulate-veined, the apex acute or acuminate, the base narrowed, the slender petioles 6–12 mm. long; inflorescence terminal, pubescent, the flowers in small paniced glomerules; staminate flowers with a calyx-tube about 5 mm. long, its lobes about one-half as long; pistillate flowers with a calyx-tube about 3 mm. long; fruit ovoid, about 6 mm. long. [*Nectandra antillana* of Millspaugh, not of Meisner; included by Meisner in *D. tenuifolia* Meisner.]

Thickets, river banks and woodlands, Porto Rico, at lower and middle elevations in wet or moist districts; Vieques; St. Croix; St. Thomas; St. Jan.—St. Martin to Tobago; Margarita. MAJAGUA DE SIERRA. MAHOUT.

Lagetta Lagetto (W. Wright) Nash, LACE-BARK TREE, native of Jamaica and Cuba, a small tree with broadly ovate leaves, the inner bark lace-like, was recorded by Krebs as grown in St. Thomas prior to 1851. [*Daphne Lagetto* W. Wright; *Lagetta lintearia* Lam.]

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VOLUME V—Part 1

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Preface—*N. L. Britton*

Descriptive Flora—Spermatophyta (Part)—*N. L. Britton*
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