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# THE FLORA OF BARRO COLORADO ISLAND, PANAMA

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## THE FLORA OF BARRO COLORADO ISLAND, PANAMA

By PAUL C. STANDLEY

The logical position of the Republic of Panama as a center for educational work has been recognized throughout the American countries ever since work was begun upon the Panama Canal. It is therefore particularly appropriate that there should be established here in the Canal Zone a laboratory for tropical research in the biological sciences. On April 17, 1923, Barro Colorado Island, in Gatún Lake, was set aside by the Governor of the Canal Zone as a permanent reservation, to preserve in a primitive state the animal and plant life of the region. This result was accomplished largely through the personal interest and effort of Dr. Thomas Barbour and Mr. James Zetek, the latter now resident custodian of the island.

Through the persevering effort of these two persons, also, there has been constructed upon the island a commodious and substantial laboratory with ample living quarters, in which one may enjoy every bodily comfort while carrying on investigations of the highly diversified fauna and flora. Although secluded from the distractions of such towns as Colón and Panama, one is within easy reach of their conveniences. From the windows of the laboratory, situated at the top of a high, steep slope, one may see all day long an ever-changing procession of the world's ships, passing almost before the door.

The laboratory is operated by the Institute for Tropical Research, under the direction of the National Research Council, and a cordial welcome is extended to scientists who wish to make serious use of its facilities. The expenses of administration are borne in part by subscriptions of scientific and educational institutions, and in part by private individuals.

Barro Colorado, the largest island of Gatún Lake, covers approximately six square miles, being about three miles in greatest length and width. It is of artificial origin, and before the water was turned into the lake formed merely a part of the hills along the Chagres River. Near the laboratory site ran one of the cuts of the old French canal, and close at hand was the town of Bohío, now submerged.

The island consists of a mass of hills, steep in places, broken by ravines through which run a few small clear streams. Since the low

land along the Chagres was submerged when the lake was filled, there is little swampy land on the island, although about the upper end there is a small amount of aquatic and semi-aquatic vegetation. The shore line, nearly 25 miles long, is very irregular, with innumerable indentations, in some of which are still standing the gray trunks of trees killed when the lower slopes of the hills were inundated. The highest part of the island is 537 feet above sea level, and 450 feet above the main level of Gatún Lake.

Along its north side the island is separated from the mainland by a narrow channel, formed by a diversion canal of the old French days. Toward the south lies the main expanse of Gatún Lake, traversed by the Canal, and on the distant shore is Frijoles, a station of the railroad which crosses the Isthmus from Colón to Panama.

Most of Barro Colorado Island is covered with dense forest and jungle. In a few places there are patches of comparatively level, deforested land, the sites of recently cultivated clearings now abandoned and overgrown with coarse weeds and second-growth shrubs. Within a few years these fields will be invaded by trees.

It is probably true that little of the island is covered with really virgin forest, but the woods have been so long undisturbed that one will hardly recognize the fact. The large number of palms and tree ferns indicates that some of the slopes and ravines have never been wholly cleared, these being plants which disappear when the forest is opened and probably never reestablish themselves. In a region such as the Canal Zone, for over 400 years under European influence and during all this time an important trade route, it is difficult to prove that a given tract of land has not been cleared or put under cultivation at some time during these centuries, of whose detailed history we know so little.

At any rate, the present plant covering of Barro Colorado has every aspect of the typical virgin forest occupying the humid lowlands of Central America, and is so rank and dense that in order to penetrate it a way must be cut with a machete. Many of the trees tower to a vast height, and have massive trunks swathed in a mantle of epiphytic vegetation that is still to be studied. Ropelike vines or lianas dangle from the crowns of the tallest trees, whose branches are loaded with aroids, bromeliads, orchids, and other epiphytes.

Palms are unusually abundant, and many of the 22 genera known from the Canal Zone exist here. Ferns, particularly handsome tree ferns of the genus *Hemitelia*, are plentiful, although in Central America most species of ferns must be sought at much higher eleva-

tions. Species of *Piper* are numerous, also Araceae, Rubiaceae, and Bignoniaceae, and most of the important groups of lowland Central American plants are represented. Thus far the cryptogamic plants have been little studied, but there must be a wealth of fungi. The lichens, hepatics, and mosses of the tropics are not highly diversified at so low an altitude.

The present list of the plants known from Barro Colorado Island is based chiefly upon personal collections and notes. I visited the island first on January 17, 1924, and collected that day about 300 numbers of plants. Collecting was then difficult, because there was only a single, inadequate trail; but now trails have been opened upon every hand, and may be extended easily, so there is little limit to one's range of activity.

During November, 1925, I spent a week upon the island as the guest of the laboratory. About 500 specimens of plants were taken, chiefly of the rarer and more interesting species, and notes were made of all the common plants observed. Trips were made each day in some new direction, hence it is believed that the list here offered is fairly representative of the flora. No one familiar with tropical conditions would venture to say that it is nearly complete, for by the very nature of its vegetation, such an area, with its many local or infrequent species, it is almost impossible to exhaust. Probably the next botanist who visits the island will be puzzled by the omission from this list of some plant which to him appears one of the common species.

November did not seem to be an especially favorable period for collecting, and few plants were found in flower. Probably the beginning of the rainy season, in spring, would be the best time for botanizing, although even then one must have good luck to find in proper condition some of the trees and shrubs that flower for only a brief season. The trees are difficult to study, since usually one must guess at their identity from their lofty branches as viewed from the ground, or sort the bits of leaves and flowers strewn upon the soil. There must be several species of trees on Barro Colorado that are not enumerated here, and more than a few shrubs and herbs.

No botanist can fail to be interested by the tropical vegetation so luxuriantly displayed here, and it is to be hoped that many botanical workers will take advantage of the opportunity offered for studying a characteristic area of tropical vegetation, at slight expense. This is an excellent place for making one's first acquaintance with tropical American plants, for no local flora of tropical America is better

known, and its variety is equal to that of most localities of similar altitude.

For a study of the ecology of a typical area of lowland tropical vegetation, Barro Colorado offers exceptional advantages, and the morphology of certain groups of plants could be investigated profitably. Few indeed are the Central American localities in which it is possible to find comfortable lodging with the jungle but a few steps from the door. A large number of zoologists have visited Barro Colorado Island, some of them remaining several weeks or months to carry on their studies, and the list of published papers based upon work performed here forms an extensive bibliography.

The botanist also will be interested in the wealth of animal life that may be observed. Freedom from molestation has made the mammals and birds tame, and it is possible to see many kinds that elsewhere are timid and seldom visible. Flocks of chattering parrots and parakeets fly all day long over the trees, and literally hundreds of other birds may be seen about the forest. Peccaries may be encountered along any trail, and sitting in the evening on the steps of the laboratory, one may watch the monkeys going to their sleeping places. Deer are found in the forest, and jaguars have been seen from the laboratory. In the mud the tracks of tapirs, the largest Central American mammal, are found now and then, and one is likely to meet upon the trail other smaller but interesting animals. Insects are not more plentiful than elsewhere, and I do not remember to have been troubled by anything more disagreeable than ants, the worst pests of tropical forests. Snakes exist here, some of them venomous, but they need occasion only a fair amount of caution. I happened to see none upon the island.

This list is little more than an enumeration of the names of the species of plants now known to occur on Barro Colorado Island. I hope that at some time it may be practicable to prepare a descriptive flora of the island, but it is better to leave such a work until the list is more nearly complete. In the near future there will be published, as volume 27 of the Contributions from the National Herbarium, an account of the plants of the Canal Zone, with keys for their determination, and it is felt that to publish here keys to the species would be an unnecessary repetition.

Besides my own collections, I have had access to a few others made on the island: those of Dr. William R. Maxon, who collected here June 6, 1923; of Prof. F. L. Stevens, of the University of Illinois, who visited the island in September, 1924; and of Prof. C. W. Dodge,

of Harvard University, who was engaged in study of the fungi during the summer of 1925, and has furnished a list of the flowering plants he collected at that time. Among the other botanists who have visited the island are Dr. A. S. Hitchcock and Mr. O. F. Cook, of the U. S. Department of Agriculture, and Prof. G. R. Bisby, of Manitoba Agricultural College.

In addition to the species listed there are still on hand some sterile specimens which it has been impossible to identify. Most of these represent additions to the flora of Panama and probably to that of North America. Some of them doubtless will prove of great interest, but their recognition must await the collection of more complete material or a fortunate association with named specimens from other regions.

The Spanish vernacular names given for the species here listed are those used in Panama, and many of them were verified upon the island. Well established English names have been cited when available.

In the present paper there are listed for Barro Colorado Island 611 species of plants. Of these at least 38 species are introduced.

## FUNGI

The list of fungi is based partly upon specimens collected by myself and identified by Dr. J. R. Weir of the U. S. Department of Agriculture. There are included also numerous records supplied by Prof. F. L. Stevens and Prof. G. R. Bisby.

*Arcyria cinerea* Pers.

*Auricularia mesenterica* Bull. This, like most of the fleshy and woody fungi growing upon logs and tree trunks, is called in Panama as well as elsewhere in Central America "orejas" or "orejitas."

*Bagnisiopsis peribebuyensis* (Speg.) Theiss. & Syd. On *Miconia argentea*.

*Camillea cyclops* Mont.

*Camillea Sagraeana* (Mont.) B. & C.

*Cookeina sulcipes* (Berk.) Kuntze.

*Cookeina tricholoma* (Mont.) Kuntze.

*Fomes Auberianus* Mont.

*Fomes ferreus* Berk.

*Fomes marmoratus* Berk.

*Ganoderma* sp.

*Geaster* sp.

*Gloeoporus conchoides* Mont.

*Hexagonia tenuis* (Hook.) Fr.

*Hexagonia variegata* Berk.

*Hirneola delicata* (Fr.) Bres.

*Hirneola polytricha* Mont.

*Hymenochaete damaecornis* Link & Lev.

*Irenina Shropshiriana* Stevens, sp. nov. On *Miconia argentea*.

*Laschia auriscalpium* Mont.

*Laschia pezizoidea* Berk.

*Lentinus strigellus* Berk.

*Lentinus velutinus* Fr.

*Meliola Heliconiae* Stevens, sp. nov. On *Heliconia* sp.

*Meliola Musae* (Kunze) Mont. On *Heliconia* sp.

*Meliola palmicola* Winter.

*Meliola Panici* Earle. On *Olyra latifolia*.

*Meliola peruviana irregularis* Stevens, var. nov. On Bignoniaceae indet.

*Meliola Pilocarpi* Stevens. On *Zanthoxylum* (?)

*Polyporus brachypus* Lev.

*Polyporus gracilis* Kl.

*Polyporus infernalis* Berk.

*Polyporus licnoides* Mont.

*Polyporus lignosus* Kl.

*Polyporus subelegans* Murr.

*Polyporus virgatus* B. & C.

*Polystictus arenicolor* Berk.

*Polystictus crocatus* Fr.

*Polystictus occidentalis* (Kl.) Fr.

*Polystictus sanguineus* (L.) Fr.



*Polystictus Steinheilianus* Berk. & Lev. "Really a thin form of *Trametes rigida* Berk. & Mont."

- Polystictus versatilis* Berk.
- Polystictus versicolor* (Dicks.) Fr.
- Poria vineta* (Berk.) Cke.
- Schizophyllum commune* (L.) Fr.
- Stereum flabellatum* Pat.
- Stereum glabrescens* Berk.?
- Stereum papyrinum* Mont.
- Thelephora pusiola* Pat.?
- Trametes caperatus* Berk.
- Trametes cubensis* Mont.
- Trametes hydnoïdes* (Sw.) Fr.
- Trametes rigida* Berk. & Mont.
- Xylaria axifera* Mont.
- Xylaria cubensis* Mont.

The records of the following rusts have been supplied by Prof. H. S. Jackson, of Purdue University. The specimens were collected by Prof. F. L. Stevens.

- Puccinia Emiliae* P. Henn. On *Neurolaena lobata* (L.) R. Br.
- Uredo Dioscoreae* P. Henn. On *Dioscorea urophylla* Hemsl.

#### LICHENS

The following species has been determined by Mr. G. K. Merrill. The number of lichens occurring on Barro Colorado is not large, but there are other species besides the one listed.

- Leptogium azureum* (Swartz) Mont.

#### MOSESSES

The following mosses have been determined by Mr. Edwin B. Bartram:

- Bryum coronatum* Schwaegr.
- Crossomitrium Wallisi* C. M.
- Lepodipilum polytrichioides* (Hedw.) Brid.
- Neckeropsis disticha* (Hedw.) Fleisch.
- Octoblepharum albidum* (L.) Hedw.
- Pilotrichum ramosissimum* Mitt.
- Taxithelium planum* (Brid.) Mitt.
- Thuidium schistocalyx* (C. M.) Mitt.

#### SCHIZAEACEAE. Curlygrass Family<sup>1</sup>

*Lygodium polymorphum* (Cav.) H. B. K. A slender vine, very hairy, in cut-over places.

- Lygodium radiatum* Prantl.

#### CYATHEACEAE. Tree Fern Family

*Hemitelia petiolata* Hook. Frequent; a very handsome plant, the only tree fern known to occur on the island.

<sup>1</sup>An annotated list of the ferns and fern allies of Barro Colorado has been published recently by the writer in the *American Fern Journal* 16: 112-120; 17: 1-8. 1927. The identifications are by Dr. William R. Maxon.

## MARATTIACEAE. Marattia Family

*Danaea nodosa* (L.) J. E. Sm. Frequent in the forest.

## POLYPODIACEAE. Polypody Family

*Acrostichum* sp. A species of this genus grows in shallow water about the edge of the lake, but specimens have not been collected. It is either *A. aureum* L. or *A. daneaeifolium* Langsd. & Fisch., both of which are common in the region.

*Adiantum lucidum* Swartz. Common in the forest.

*Adiantum philippense* L. Infrequent.

*Adiantum* sp. (*Standley* 31330). An unidentified and perhaps undescribed species.

*Ananthacorus angustifolius* (Swartz) Underw. & Maxon. An epiphytic plant.

*Anetium citrifolium* (L.) Splitg. Epiphytic.

*Asplenium serratum* L. Epiphytic. The American birds-nest fern.

*Cyclopetlis semicordata* (Swartz) J. Sm. Abundant.

*Dictyoxiphium panamense* Hook.

*Diplazium delitescens* Maxon. Abundant.

*Diplazium grandifolium* Swartz.

*Dryopteris dentata* (Forsk.) C. Chr.

*Dryopteris Poiteana* (Bory) Urban. Frequent in the forest.

*Elaphoglossum Herminieri* (Bory & Féc) Moore. Epiphytic.

*Eschatogramme furcata* (L.) Trev. Epiphytic.

*Leptochilus cladorrhizans* (Spreng.) Maxon. Common.

*Nephrolepis pendula* (Raddi) J. Sm. Epiphytic.

*Pityrogramma calomelaena* (L.) Link. In open places.

*Polybotrya caudata* Kunze. A creeping and climbing epiphyte.

*Polybotrya osmundacea* Humb. & Bonpl. A large climbing epiphyte.

*Polypodium ciliatum* Willd. Epiphytic.

*Polypodium crassifolium* L. A coarse epiphyte.

*Polypodium occultum* Christ. Epiphytic.

*Polypodium pectinatum* L., form. An epiphyte.

*Polypodium percussum* Cav. Epiphytic.

*Saccoloma elegans* Kaulf. A common handsome terrestrial plant.

*Stenochlaena vestita* (Fourn.) Underw. A large creeping epiphyte.

*Tectaria euryloba* (Christ) Maxon.

*Tectaria martinicensis* (Spreng.) Copel. Common in the forest.

*Vittaria lineata* (L.) J. E. Sm. A common epiphyte, with grasslike leaves.

## HYMENOPHYLLACEAE. Filmy-fern Family

*Trichomanes Godmani* Hook. Epiphytic, like the other local species of the genus.

*Trichomanes Krausii* Hook. & Grev.

*Trichomanes sphenoides* Kunze.

## SALVINIACEAE. Salvinia Family

*Salvinia auriculata* Aubl. Floating in quiet water.

## LYCOPODIACEAE. Clubmoss Family

*Lycopodium cernuum* L. Reported by Prof. C. W. Dodge.

## SELAGINELLACEAE. Selaginella Family

*Selaginella conduplicata* Spreng. Common in the forest.

*Selaginella Fendleri* Baker.

*Selaginella haematodes* (Kunze) Spring. Common; easily recognized by its dark red stems.

*Selaginella Schrammii* Hieron.

*Selaginella sylvatica* Baker.

## TYPHACEAE. Cattail Family

*Typha angustifolia* L. CATTAIL. In shallow water at the edge of the lake.

## POACEAE. Grass Family

The identifications in this family have been made by Dr. A. S. Hitchcock and Mrs. Agnes Chase.

*Andropogon condensatus* H. B. K. In clearing; scarce.

*Arthrostylidium racemiflorum* Steud. A common slender bamboo.

*Axonopus compressus* (Swartz) Beauv. CARPET GRASS. Common.

*Cenchrus viridis* Spreng. SANDBUR. In open places.

*Chloris radiata* (L.) Swartz. In clearings; rare.

*Chusquea simpliciflora* Munro. A slender bamboo, common in the forest.

*Cynodon dactylon* (L.) Pers. BERMUDA GRASS. In open places; introduced.

*Digitaria sanguinalis* (L.) Scop. CRABGRASS.

*Eleusine indica* (L.) Gaertn. In open places.

*Gynerium sagittatum* (Aubl.) Beauv. CANE. A tall coarse grass, in wet places.

*Hymenachne amplexicaulis* (Rudge) Nees. In shallow water.

*Ichnanthus nemorosus* Doell. Common.

*Ichnanthus pallens* (Swartz) Munro. Common.

*Ischaemum rugosum* Salisb. In clearings.

*Lasiacis sorghoidea* (Desv.) Hitchc. & Chase. A common coarse vine.

*Olyra latifolia* L. Common in forest.

*Oplismenus Burmanni* (Retz.) Beauv. Very common.

*Oplismenus hirtellus* (L.) Beauv. Common.

*Orthoclada laxa* (Rich.) Beauv. In forest.

*Oryza sativa* L. RICE. ARROZ. Upland rice has been planted on the island.

*Panicum pilosum* Swartz. In clearing.

*Panicum trichoides* Swartz. Common.

*Paspalum conjugatum* Berg. Common.

*Paspalum paniculatum* L. In clearing.

*Pharus glaber* H. B. K. Frequent in forest.

*Pharus latifolius* L. Frequent.

*Polytrias amaurea* (Büse) Kuntze. Well established in the lawn at the laboratory.

*Saccharum officinarum* L. SUGAR CANE. CAÑA. Planted at the laboratory, and about the old clearings.

*Setaria geniculata* (Lam.) Beauv. Common in open places.

*Setaria vulpiseta* (Lam.) Roem. & Schult. In a clearing; rare.

*Streptochaeta Sodiroana* Hack. In the forest.

*Streptogyne crinita* Beauv. In the forest; occasional.

*Zea mays* L. MAIZE. MAÍZ. Planted at the laboratory.

#### CYPERACEAE. Sedge Family

*Cyperus caracasanus* Kunth. JUNCO. In open places.

*Cyperus ferax* Rich. JUNCO. Occasional in clearings.

*Cyperus giganteus* Vahl. A giant plant in water at the edge of the lake; in habit resembling the African papyrus.

*Dichromena radicans* Schlecht. & Cham. CLAVO. In open places.

*Fimbristylis diphylla* (Retz.) Vahl. In clearings.

*Fuirena umbellata* Rottb. In shallow water at the edge of the lake.

*Kyllinga pumila* Michx. In open places.

*Mariscus jamaicensis* (Crantz) Britton. SAWGRASS. Common in shallow water at the edge of the lake.

*Rynchospora cephalotes* (L.) Vahl. PAJA MACHO DE MONTE ("tapir grass"). In open places.

*Scleria bracteata* Cav. CORTADERA, CUCHILLITO. The Spanish name alludes to the fact that the sharp edges of the leaves cut the skin like a knife.

*Scleria melaleuca* Schlecht. & Cham.

#### PHOENICACEAE. Palm Family

Other palms than those listed probably occur here.

*Acanthorrhiza Warscewiczii* Wendl. NOLÍ, PALMA DE ESCOBA. Scarce. The only fan palm of the region. The leaves are used for brooms and for thatching.

*Asterogyne* sp. (*Geonoma cuneata* Wendl.?) RABO AHORCADO. A nearly stemless, small plant, the mostly simple leaves deeply lobed at the apex; flowers in simple spikes.

*Astrocaryum polystachyum* Wendl. A tall plant with spiny trunk.

*Bactris* sp. (Subgenus *Trichobactris*.) A slender, very spiny palm, in forest; common.

*Calyptogyne* sp. A small plant, stemless or with a short trunk; leaves with numerous narrow segments; flowers in simple spikes.

*Chamaedorea Wendlandiana* (Oerst.) Hemsl. CAÑA VERDE, BOLÁ. A slender graceful palm with smooth green stems.

*Cocos nucifera* L. COCONUT. COCO. A few trees about the sites of former houses; introduced.

*Geonoma* sp. Probably two species grow here. Slender plants with pinnate leaves, unarmed stems, and branched inflorescences.

*Iriartea exorrhiza* Mart. STILT PALM. JIRA. A tall palm with slender smooth green trunk, the trunk supported by stout prop roots, which are covered with very short spines.

*Pyrenoglyphis major* (Jacq.) Karst. LATA, PALMA BRAVA. A very spiny plant, similar to *Bactris*, but with much larger fruits.

*Synechanthus Warscewiczianus* Wendl. PALMILLA, BOLÁ. A slender palm, similar in appearance to *Chamaedorea*.

CYCLANTHACEAE. *Cyclanthus* Family

*Carludovica palmata* Ruiz & Pav. PANAMA HAT PALM. PORTORRICO, JIPIJAPA, RAMPIRA, IRACA. A stemless plant with numerous long-stalked leaves, the blades cleft so as to resemble a Maltese cross. It is from the young leaves of this plant that the famous "Panama" hats are made, in Ecuador.

*Cyclanthus bipartitus* Poit. PORTORRICO. A stemless plant, the leaves cleft into two broad divisions. Easily recognized by the fruit, which resembles a large screw.

## ARACEAE. Arum Family

Plants of this family are particularly abundant on Barro Colorado. The epiphytic species constitute a large part of the vegetation seen upon tree trunks.

*Anepias Moritzianus* Schott.

*Anthurium aemulum* Schott. A large epiphytic vine with parted leaves.

*Anthurium Friedrichsthali* Schott. A small acaulescent epiphyte with linear leaves.

*Anthurium Holtonianum* Schott. A very showy species, a large vine with huge leaves, digitately parted into several broad segments.

*Anthurium maximum* (Desf.) Engler. An acaulescent epiphyte, with large broad simple leaves.

*Anthurium Schlechtendalii* Kunth. An acaulescent epiphyte.

*Anthurium scolopendrinum* (Ham.) Kunth. Acaulescent, with narrow entire leaves.

*Anthurium triangulum* Engler. Leaves sagittate.

*Dieffenbachia Oerstedii* Schott. OTÓ DE LAGARTO. Called "dumb-cane" by the West Indians. A coarse terrestrial herb with erect stems and broad leaves. The crushed plant has a skunklike odor. The juice is very irritant in contact with the skin, and care must be exercised in handling the plant.

*Monstera dilacerata* Koch. A large and handsome epiphytic vine with deeply pinnatifid, broad leaves.

*Monstera pertusa* (L.) de Vriese. A coarse vine, recognized at once by the broad leaves perforated with numerous large holes.

*Philodendron coerulescens* Engler. Epiphytic vine with ovate entire leaves.

*Philodendron grandipes* Krause. An acaulescent terrestrial plant with rounded-cordate leaves; very common.

*Philodendron Karstenianum* Schott. An epiphyte with oblong leaves.

*Philodendron radiatum* Schott. AZOTA CABEZA, CHALDÉ. A large handsome vine, the leaves deeply pinnatifid into narrow segments; very common.

*Philodendron rigidifolium* Krause. CINCHADORA. Epiphyte with broad ovate leaves.

*Philodendron tripartitum* (Jacq.) Schott. A common vine, recognized readily by the leaves, which are parted into 3 oblong entire segments.

*Philodendron Wendlandii* Schott. Epiphytic vine with oblong leaves, cordate at base.

*Pistia stratiotes* L. WATER-LETTUCE. Floating in quiet water. Very unlike the other members of the family, the plant consisting of a rosette of spongy, broadly wedge-shaped, pale green leaves.

*Spathiphyllum Patini* (Hogg) N. E. Brown. Acaulescent terrestrial plant.

*Stenospermaton sessile* Engler. Large epiphytic vine with lance-oblong leaves.

*Xanthosoma helleborifolium* (Jacq.) Schott. PAPAYUELO. Terrestrial plant with a single leaf, this parted into 5 to 13 lobed segments; petiole handsomely blotched with brown.

*Xanthosoma violaceum* Schott. OTÓ. Called "badú" and "coco" by the West Indians. Planted at the laboratory; cultivated commonly in the lowlands of tropical America for its tuberous roots, which are cooked and eaten much like potatoes. The plant resembles the caladium or elephant-ear cultivated for ornament.

#### LEMNACEAE. Duckweed Family

*Lemna cyclostasa* (Ell.) Chev. DUCKWEED. Mr. Zetek reports that he has seen a plant of this family in quiet water about the island. The species listed is the only member of the family known at present from the Canal Zone, but it is possible that others occur here.

#### BROMELIACEAE. Pineapple Family

*Ananas magdalenae* (André) Standl. PITA, PIÑUELA. Called "pingwing" by the West Indians. Common in forests. Similar in habit to the pineapple, the red flowers forming a large hard globose head. The long, very spiny leaves furnish one of the best fibers known, the "pita floja." The plants often form dense thickets which are almost impenetrable.

*Ananas sativus* Schult. PINEAPPLE. PIÑA. Planted at the laboratory.

*Billbergia pallidiflora* Liebm. An epiphyte with pendent flower spikes, the few long leaves spiny-margined and handsomely blotched with silver.

*Catopsis tenella* Mez. A small epiphyte with dioecious flowers and broad, thin, bright green leaves.

*Guzmania minor* Mez. An epiphyte with broad, bright green, thin leaves, the inflorescence short and dense, with showy, red or purple bracts.

*Tillandsia bulbosa* Hook. An epiphyte with a hard, dark, bulblike base.

*Tillandsia digitata* Mez. An epiphyte with a cluster of many gray leaves.

#### COMMELINACEAE. Dayflower Family

*Campelia zanonía* (L.) H. B. K. An erect herb about a meter high, with conspicuous, dark blue, juicy fruit.

*Commelina elegans* H. B. K. DAYFLOWER. CODILLO. A fleshy procumbent herb with bright blue flowers, resembling the Wandering Jew of gardens.

*Dichorisandra hexandra* (Aubl.) Standl. An erect branched herb, about a meter high, with small blue flowers.

*Tradescantia geniculata* Jacq. An inconspicuous, procumbent, very hairy herb with small white flowers.

#### PONTEDERIACEAE. Pickerelweed Family

*Piaropus azurea* (Swartz) Raf. WATER-HYACINTH. I have no record of having seen this plant on Barro Colorado, but it certainly must occur somewhere about the shores, since it is frequent in Gatún Lake. If left to itself it would overgrow the lake, but efforts have been made to exterminate the plant, hence it is not abundant anywhere.

**LILIACEAE. Lily Family**

*Taetsia fruticosa* (L.) Merrill. Planted at the laboratory. One of the so-called *Dracaenas*; much planted for ornament in Panama. A tall plant with green or more commonly red or purple leaves.

**SMILACACEAE. Sarsaparilla Family**

*Smilax mollis* Willd. A common small vine with pubescent foliage.

*Smilax panamensis* Morong. GREENBRIER. ZARZA. A common large vine with very prickly stems and glabrous foliage.

**HAEMODORACEAE. Bloodwort Family**

*Xiphidium caeruleum* Aubl. PALMITA. Common in the forest. An herb, marked by its fleshy, vertically 2-ranked leaves, suggesting those of an iris; flowers small and whitish, the fruit a small red berry.

**AMARYLLIDACEAE. Amaryllis Family**

*Hymenocallis americana* (L.) Salisb. SPIDERLILY. Called "euchar lily" by the West Indians. I found it in the forest on one of the hills of the island, at the site of a former dwelling. It is normally a seashore plant, but is often grown for ornament because of its handsome white flowers.

**DIOSCOREACEAE. Yam Family**

*Dioscorea alata* L. YAM. ÑAME. The common yam, planted at the laboratory.

*Dioscorea urophylla* Uline. BEJUCO DE SAINA. A native species, growing in the forest.

**IRIDACEAE. Iris Family**

*Marica gracilis* Herb. An inconspicuous herb with narrow leaves, occasional in the wet forest.

**MUSACEAE. Banana Family**

*Heliconia acuminata* Rich. A small herbaceous plant with small leaves; inflorescence erect, with deep red bracts. The *Heliconias* are known in Panama as "platanillo," or sometimes as "lengua de vaca." They are conspicuous plants in the forests and in swamps. The bracts hold water in which mosquitoes sometimes breed.

*Heliconia latispatha* Benth. PLATANILLO, GUACAMAYA. Similar to the last species, but much larger; inflorescence erect, the bracts red, tinged with yellow or orange.

*Heliconia Mariae* Hook. BEEFSTEAK HELICONIA. PLATANILLO. Called by the West Indians "wild plantain" or "wild banana." The largest and most showy species of the region, often forming dense thickets, the plants several meters high, with leaves as large as those of the banana. Inflorescence very large, thick, and heavy, pendent, with broad, closely crowded, red bracts.

*Heliconia pendula* Wawra. A medium-sized plant with tomentose, pendent, dark red inflorescence.

*Musa paradisiaca* L. PLANTAIN. PLÁTANO. Planted at the laboratory and elsewhere.

*Musa sapientum* L. BANANA. Planted at the laboratory and about the old clearings.

#### ZINGIBERACEAE. Ginger Family

*Costus sanguineus* Donn. Smith. The species of *Costus* are common in the forests. They are tall plants with simple leafy stems, the stems formed by the tightly rolled leaf petioles. In this species the flower spikes are fusiform, with closely appressed, unappendaged, red bracts.

*Costus spicatus* (Jacq.) Swartz. Spikes cylindric or subglobose, the bracts not appendaged, in age loose and spreading.

*Costus villosissimus* Jacq. CAÑAGRIA, CAÑA DE MICO. Plant very villous; bracts with leafy, green or red appendages.

*Dimerocostus uniflorus* (Poepp.) Schum. A tall plant, usually 3 to 4 meters high, resembling the *Costus* species; usually growing in water. Flowers white, 7 to 8 cm. long, opening one at a time on each plant.

*Renealmia occidentalis* (Swartz) Sweet. Stems leafy, in clumps, 1 to 2.5 meters high; inflorescences short, arising from the ground at the base of the plant; berries red or dark blue, with orange pulp.

*Renealmia strobilifera* Poepp. & Endl. Stems leafy, 1.5 to 3 meters high; inflorescence conelike, bright orange.

#### MARANTACEAE. Arrowroot Family

*Calathea insignis* Peters. The Calatheas, common in wet forest and swampy places, are coarse herbs with broad leaves like those of cannas, the flowers in dense spikes. In this species the spikes are strongly compressed, the bracts thin and parchment-like.

*Calathea lutea* (Aubl.) Meyer. HOJA BLANCA. Leaves whitish beneath; bracts distichous but not strongly compressed, thick and leathery.

*Calathea macrosepala* Schum. BIJAO. Spikes small and headlike, very dense, not compressed.

*Ischnosiphon leucophaeus* (Poepp. & Endl.) Koern. Leaves white beneath; flowers in very slender, terete spikes.

*Myrosma panamensis* Standl. A stemless plant with broad leaves about a foot long, the flowers in simple spikes.

*Pleistachya pruinosa* (Regel) Schum. Easily recognized by the broad leaves, which are dark red or purple beneath. Common in forest.

#### BURMANNIACEAE. Burmannia Family

*Ophiomeris panamensis* Standl. Known only from Barro Colorado, where it was collected by Prof. C. W. Dodge. A small delicate whitish saprophyte, the slender stem bearing a single lopsided flower, three of whose lobes end in long filiform appendages.

#### ORCHIDACEAE. Orchid Family

The identifications have been made chiefly by Mr. Oakes Ames.  
*Aspasia principissa* Reichenb. f. Epiphytic.



*Bulbophyllum pachyrrachis* (A. Rich.) Griseb. An epiphytic orchid with very small flowers in pendent spikes which have a thick fleshy rachis.

*Catasetum viridiflavum* Hook. A showy epiphytic species, the green and yellow flowers resembling those of the northern lady's-slippers.

*Epidendrum anceps* Jacq. Epiphytic.

*Epidendrum difforme* Jacq. Epiphytic.

*Epidendrum Rousseauae* Schlechter. Epiphytic.

*Epidendrum stenopetalum* Hook. An epiphyte.

*Maxillaria Macleei* Batem. Epiphytic.

*Oncidium ampliatum* Lindl. BUTTERFLY ORCHID. A handsome plant with large, yellow and brown flowers which suggest butterflies.

*Ornithocephalus bicornis* Lindl. Epiphytic; easily recognized by its equitant leaves, suggesting those of iris. Flowers very small, resembling in form a bird's head, hence the generic name.

*Peristeria elata* Hook. DOVE ORCHID OR HOLY GHOST FLOWER. ESPÍRITU SANTO. A tall terrestrial species, famed for its handsome white flowers, whose central organs suggest by their form a dove with outspread wings.

*Pleurothallis Brighamii* Wats. Epiphytic.

*Pleurothallis marginata* Lindl. Both these species are very small plants with inconspicuous flowers.

*Sobralia panamensis* Schlechter. A terrestrial plant with tall leafy stems and handsome large purple flowers, which last only part of a single day, closing about noon.

*Vanilla pompona* Schiede. VANILLA. VAINILLA. A large vine, common nearly everywhere in this part of Panama.

#### PIPERACEAE. Pepper Family

*Peperomia caudulilimba longependula* C. DC. All the species of *Peperomia* occurring on the island are small succulent epiphytic herbs.

*Peperomia conjungens* Trel. Type from Barro Colorado.

*Peperomia gatunensis* C. DC.

*Peperomia rotundifolia* (L.) H. B. K. POLEO. Leaves rounded, very thick and lens-like.

*Piper acutissimum* Trel. CORDONCILLO. All the species of *Piper* growing here are terrestrial shrubs. They are abundant in wet forest, and often grow in open places. The names given to the species are "cordoncillo," "gusanillo," and "hinojo." The West Indians use the name "cowfoot."

*Piper auritum* H. B. K. SANTA MARÍA DE ANÍS. A large coarse suffrutescent plant, easily recognized by its very broad, deeply cordate leaves, and by the characteristic odor of the crushed leaves, suggestive of sarsaparilla.

*Piper cordulatum* C. DC.

*Piper culebranum* C. DC.

*Piper imperiale* (Miquel) C. DC. A plant with very large leaves, the petioles with numerous fleshy wartlike protuberances.

*Piper laxispicum* Trel. Type from Barro Colorado.

*Piper paulownifolium* C. DC.

*Piper pseudo-cativalense* Trel.

*Piper pseudo-garagaranum* Trel. Type from Barro Colorado.

*Piper pseudo-variabile* Trel.

*Piper pubistipulum estylosum* Trel. Type from Barro Colorado.

*Piper san-joseanum* C. DC. HINOJO.

*Piper smilacifolium* C. DC.

*Piper subnudispicum* Trel.

*Piper viridicaule* Trel. Type from Barro Colorado.

*Pothomorphe peltata* (L.) Miq. SANTA MARÍA. A suffrutescent plant with rounded-cordate leaves, the spikes in umbels.

#### ULMACEAE. Elm Family

*Celtis iguanaea* (Jacq.) Sarg. Shrub or small tree, the branches usually pendent or clambering, armed with recurved spines.

*Trema micrantha* (L.) Blume. Small tree with narrow gray leaves and very small, red fruits.

#### MORACEAE. Mulberry Family

*Artocarpus communis* Forst. BREADFRUIT. ARBOL DE PAN, FRUTA DE PAN. Planted at the laboratory.

*Castilla panamensis* Cook. RUBBER TREE, CAUCHO, HULE, ULE. A common forest tree, the only species of the immediate region.

*Cecropia* sp. GUARUMO. Three species of *Cecropia* are known from the Canal Zone, and all may occur on Barro Colorado. No specimens suitable for identification have been collected on the island. The species are small trees with prop-roots, and very large, deeply palmate-lobed leaves which are white-tomentose beneath. The hollow branches are inhabited by ants.

*Coussapoa panamensis* Pittier. A tree, usually epiphytic, at least at first, with large ovate leaves white-tomentose beneath.

*Ficus costaricensis* (Liebm.) Miquel.? Sterile specimens only, and the determination therefore somewhat doubtful. In Panama the wild figs are usually called "matapalo," "higo," or "higuero." They are large trees, often strangling or epiphytic, and frequently with large buttresses.

*Ficus crassiuscula* Warb.

*Ficus glabrata* H. B. K. HIGUERÓN. A common tree, with very large fruits.

*Ficus Hemsleyana* Standl.

*Ficus Tonduzii* Standl. Common; leaves very broad, with few coarse nerves.

*Helicostylis latifolia* Pittier. BERBÁ, CHOYBÁ, QUERENDO. Large tree with oblong to obovate, entire leaves.

*Inophloeum armatum* (Miquel) Pittier. NAMAGUA, MARAGUA, COCUÁ. Large tree with narrow rough leaves. From the bark of this tree the Panama Indians formerly made a coarse cloth which they used for hammocks, blankets, women's clothes, and sails for boats. The cloth is still made in some parts of the country.

*Olmedia aspera* Ruiz & Pav. Shrub or small tree with oblong long-cuspidate rough leaves. Common.

*Sorocea affinis* Hemsl. Shrub or small tree, with small red fruits in racemes.

*Trophis racemosa* (L.) Urban. Tree of medium or large size.

#### URTICACEAE. Nettle Family

*Boehmeria cylindrica* (L.) Swartz. An herb in water about the edge of the lake.

*Myriocarpa yzabalensis* (Donn. Smith) Killip. Large shrub, the minute whitish flowers in numerous pendent, very slender spikes sometimes 60 cm. long.

*Urera baccifera* (L.) Gaud. ORTIGA. Shrub or small tree, armed with spine-like hairs that sting the flesh painfully.

*Urera elata* (Swartz) Griseb. A tree 6 to 9 meters high, in this region known only from Barro Colorado.

#### PROTEACEAE. Protea Family

*Roupala darienensis* Pittier. Small tree with a skunklike odor; leaves partly pinnate and partly simple.

#### OLACACEAE. Olax Family

*Heisteria costaricensis* Donn. Smith. The species of *Heisteria* are shrubs with alternate entire leaves, and are easily recognized by the saucer-shaped calyx which persists with the fruit and is colored bright red.

*Heisteria macrophylla* Oerst. AJICILLO.

#### ARISTOLOCHIACEAE. Birthwort Family

*Aristolochia sylvicola* Standl. Small slender woody vine.

#### POLYGONACEAE. Buckwheat Family

*Coccoloba acuminata* H. B. K. Shrub.

*Coccoloba leptostachya* Benth. Small tree.

*Coccoloba nematostachya* (Griseb.) Lindau. HUESO. Small tree.

*Triplaris americana* L. GUAYABO HORMIGUERO, PALO SANTO. Large tree with dense racemes of purple-red flowers. The flowers appear about the first of February and are very showy, lasting for several weeks. The hollow branches are infested with savage ants, usually a species of *Pseudomyrma*.

#### AMARANTHACEAE. Amaranth Family

*Alternanthera ficoidea* (L.) R. Br. A small weedy herb.

*Alternanthera sessilis* (L.) R. Br.

*Celosia argentea* L. Rare; a few plants found, probably escaped from cultivation. The cristate form of this species, *C. cristata* L., is the cultivated cockscomb ("abanico").

*Cyathula prostrata* (L.) Blume. CADILLO. Small herb, introduced from the Old World.

*Iresine celosia* L. A common herbaceous weed.

#### NYCTAGINACEAE. Four-o'clock Family

*Neea Pittieri* Standl. Shrub or small tree.

*Pisonia aculeata* L. Large shrub or small tree, with long, often clambering branches, armed with hooked spines; fruit small, club-shaped, covered on the angles with small sticky glands.

**PHYTOLACCACEAE. Pokeberry Family**

*Petiveria alliacea* L. ANAMÚ. Herbaceous or suffrutescent, the crushed leaves with the odor of garlic; flowers appressed to the rachis of the spike; fruit bearing 4 small hooked bristles.

**PORTULACACEAE. Purslane Family**

*Portulaca oleracea* L. PURSLANE. VERDOLAGA. A rare weed.

**NYMPHAEACEAE. Waterlily Family**

*Castalia ampla* Salisb. WATERLILY. Called "duckweed" by the West Indians. In quiet water. A plant with handsome white flowers.

**MENISPERMACEAE. Moonseed Family**

*Cissampelos pareira* L. A slender vine with rounded hairy leaves, common almost throughout Central America.

*Cissampelos tropaeolifolia* DC.

*Hyperbaena panamensis* Standl. Woody vine with ovate to oblong, 3-nerved leaves.

*Sciadotenia* sp. A woody vine, perhaps of this genus, grows on the island, but only sterile specimens have been collected, hence its identification is uncertain. The broad leaves are closely white-tomentose beneath.

**ANNONACEAE. Custard-apple Family**

*Annona acuminata* Safford. CAMARÓN. Shrub, or small tree, the leaves glabrous or nearly so, narrow; fruit small, tuberculate, opening at maturity.

*Annona Hayesii* Safford. Shrub or small tree; fruit smooth, subglobose, about 5 cm. long.

*Annona Spraguei* Safford. CHIRIMOYA, NEGRITO. Tree; leaves densely pubescent beneath; fruit small, covered with clawlike tubercles.

*Desmopsis panamensis* (Robinson) Safford. Shrub or small tree; fruit a cluster of stalked pubescent berries.

*Guatteria amplifolia* Triana & Planch. Shrub or small tree with large oblong leaves; fruit a cluster of small oval berries.

*Xylopia macrantha* Triana & Planch. COROBÁ, RAYADO. Small tree.

**MYRISTICACEAE. Nutmeg Family**

*Virola panamensis* (Hemsl.) Warb. BOGAMANI, MALAGUETA DE MONTAÑA. Large tree with entire oblong leaves, stellate-tomentose beneath. Common.

**MONIMIACEAE. Monimia Family**

*Siparuna pauciflora* (Burl.) A. DC. Large shrub, strong-scented, with broad pubescent leaves.

**LAURACEAE. Laurel Family**

*Ocotea cernua* (Nees) Mez. SIGUA. A frequent tree.

*Persea americana* Mill. AVOCADO, ALLIGATOR PEAR. AGUACATE. Planted at the laboratory.

**CAPPARIDACEAE. Caper Family**

*Capparis baducca* L. Shrub.

**ROSACEAE. Rose Family**

*Rosa* sp. One of the common roses, planted at the laboratory.

**AMYGDALACEAE. Almond Family**

*Licania hypoleuca* Benth. Tree; leaves small, entire, white-tomentose beneath.

**CONNARACEAE. Connarus Family**

*Cnestidium rufescens* Planch. Large woody vine with pinnate leaves; leaflets densely pubescent beneath.

*Connarus panamensis* Griseb. Woody vine; leaflets 3, glabrous or nearly so.

*Rourea glabra* H. B. K. Large woody vine; leaflets glabrate.

**MIMOSACEAE. Mimosa Family**

*Acacia Hayesii* Benth.? UÑA DE GATO.

*Acacia melanoceras* Beurl., one of the ant-inhabited bullhorn acacias, may occur here, but the writer has not seen it on the island.

*Entada scandens* (L.) Benth. JAVILLA. Large woody vine with enormous pods several inches broad.

*Inga edulis* Mart. GUAVO. Like the other species, a good-sized tree.

*Inga Goldmanii* Pittier. GUAVO DE MONO

*Inga marginata* Willd.

*Inga panamensis* Seem. GUAVO.

*Mimosa pudica* L. SENSITIVE-PLANT. DORMIDERA, CIÉRRATE, CIERRA TUS PUERTAS. Called by the West Indians "shameweed" and "shame-face." Small herb with round heads of pink flowers.

**CAESALPINIACEAE. Senna Family**

*Bauhinia excisa* (Griseb.) Hemsl. BEJUCO DE MONO. Large woody vine with bilobate leaves. The stems are compressed and ribbon-like, and perforated with large holes.

*Bauhinia* sp. Only sterile material collected. Leaflets 2, very silky beneath, acute.

*Cassia bacillaris* L. Shrub with showy yellow flowers.

*Peltogyne purpurea* Pittier. NAZARENO, MORADO. A large tree, reported to exist here.

*Prioria copaifera* Griseb. CATIVO, AMANSA MUJER. A very common, large tree; leaves with 4 leaflets. The short broad flat fruits are much sought by peccaries.

*Toungateia simplex* (Swartz) Taub. Shrub or small tree.

## FABACEAE. Bean Family

*Aeschynomene americana* L. PEGA-PEGA. Herb with buff flowers.

*Aeschynomene sensitiva* Swartz.

*Andira inermis* H. B. K. CABBAGE-BARK. COCÚ. Large tree; leaflets 7 to 13, opposite, oblong, glabrous; flowers purple, in panicles. The wood is of good quality and is much used locally.

*Cajanus bicolor* DC. PIGEON-PEA. GUANDÚ, FRIJOL DE PALO. Shrub; much cultivated in this region for its edible seeds, and also naturalized.

*Clitoria arborescens* Ait. An erect or scandent shrub; one of the most beautiful plants of Central America, bearing clusters of shell-pink flowers about 7 cm. long.

*Coumarouna panamensis* Pittier. ALMENDRO. Common. A large tree; leaves pinnate, the leaflets 5 to 8 pairs, large, oblong, the costa close to the margin; flowers pink, in panicles. The fresh fruit is filled with an oily fragrant liquid that crystallizes when dry.

*Dioclea reflexa* Hook.? Large woody vine.

*Erythrina panamensis* Standl. Shrub or small tree with narrow, bright red flowers and red seeds.

*Machaerium marginatum* Standl.

*Machaerium microphyllum* (Meyer) Standl. Spiny woody vine with purple flowers.

*Machaerium purpurascens* Pittier.

*Machaerium Seemanni* Benth.

*Meibomia adscendens* (Swartz) Kuntze. A frequent weed.

*Meibomia axillaris* (Swartz) Kuntze. The pods are sometimes called "guavitas."

*Meibomia cana* (Gmel.) Blake. PEGA-PEGA, PEGADERA. Known among the Jamaicans as "strong-back," and used by them in domestic medicine.

*Meibomia purpurea* (Mill.) Vail.

*Meibomia scorpiurus* (Swartz) Kuntze.

*Mucuna urens* (L.) DC. CHOCHO. Large vine; pods covered with stiff bristles that penetrate the skin easily.

*Phaseolus pedunculatis* H. B. K. Small herbaceous vine.

*Phaseolus vulgaris* L. BEAN, FRIJOL. Planted at the laboratory.

*Platymiscium polystachyum* Benth. QUIRA. Large tree with racemes of small yellow flowers. The wood is of good quality, being known in commerce as Panama redwood.

*Platypodium Maxonianum* Pittier. CARCUERA. Large tree; fruit 1-seeded, winged, samara-like.

*Pterocarpus officinalis* Jacq. Large tree with small thin winged fruits. The sap turns red upon exposure to the air.

*Rhynchosia pyramidalis* (Lam.) Urban. A herbaceous vine with red and black seeds.

## ERYTHROXYLACEAE. Coca Family

*Erythroxylon amplum* Benth. Shrub with entire leaves.

*Erythroxylon panamense* Turcz.

**RUTACEAE. Rue Family**

*Citrus aurantifolia* (Christm.) Swingle. LIME. LIMÓN. Naturalized in the forest.

*Citrus sinensis* (L.) Osbeck. ORANGE. NARANJO. Planted at the laboratory.

*Zanthoxylum panamense* P. Wilson. ARCABÚ, ACABÚ, ALCABÚ. Large tree; trunk covered with large pyramidal prickles.

**SIMAROUBACEAE. Simaruba Family**

*Quassia amara* L. QUASSIA. GUAVITO AMARGO, PUESILDE, CRUCETA. Shrub or small tree with pinnate leaves and showy red flowers. The leaves and bark are as bitter as quinine.

**BURSERACEAE. Torchwood Family**

*Protium asperum* Standl. CARAÑO. A large tree. From wounds in the trunk there are distilled large quantities of a fragrant resin or balsam, which collects upon the ground. Leaflets very rough.

*Protium sessiliflorum* (Rose) Standl. ANIME. Large tree; common; leaflets smooth.

*Tetragastris panamensis* (Engler) Kuntze? Large tree; common.

**MALPIGHIACEAE. Malpighia Family**

*Hiraea faginifolia* (DC.) Juss. Woody vine, the leaves densely silky beneath.

*Stigmaphyllon Humboldtianum* Juss. Woody vine with yellow flowers. The broad leaves bear numerous stalked glands along the margins.

**TRIGONIACEAE. Trigonía Family**

*Trigonía floribunda* Oerst. Woody vine with entire leaves, densely white-tomentose beneath; flowers small and white.

**POLYGALACEAE. Polygala Family**

*Securidaca diversifolia* (L.) Blake. Large woody vine with small entire leaves; flowers pink, showy.

**EUPHORBIACEAE. Spurge Family**

*Acalypha diversifolia* Jacq. A common shrub.

*Acalypha macrostachya* Jacq. Shrub.

*Acalypha villosa* Jacq. Common shrub.

*Alchornea costaricensis* Pax & Hoffm. Small tree with ovate crenate leaves; staminate flowers in long slender drooping spikes.

*Codiaeum variegatum* (L.) Blume. A shrub with colored leaves; one of the tropical "crotons," planted at the laboratory.

*Croton Billbergianus* Muell. Arg. Large shrub or small tree growing in the wet forest.

*Dalechampia panamensis* Pax & Hoffm. Vine with 3-parted leaves; inflorescence subtended by 2 green bracts; calyx furnished with stiff hairs which penetrate the skin easily.

*Euphorbia hirta* L. HIERBA DE POLLO. Called "milkweed" by the West Indians. A small annual herb.

*Euphorbia hypericifolia* L. HERBA DE POLLO. A small glabrous annual.

*Hura crepitans* L. SANDBOX. JAVILLO. A giant forest tree, the trunk covered with small sharp spines. The milky sap causes blisters upon the skin.

*Hieronyma alchorneoides* Allem. PANTANO. Large tree with broad entire leaves bearing minute stellate scales.

*Mabea occidentalis* Benth. Shrub or small tree with oblong leaves; flowers in raceme-like terminal panicles.

*Manihot esculenta* Crantz. CASSAVA. YUCA. Much cultivated in Panama for its edible roots. Planted at the laboratory.

*Phyllanthus conami* Swartz. Shrub or small tree with small distichous ovate leaves.

*Phyllanthus niruri* L. Called by the West Indians "seed on the leaf." A small annual herb.

*Phyllanthus nobilis* (L. f.) Muell. Arg. Shrub or small tree with oblong-elliptic leaves.

#### ANACARDIACEAE. Cashew Family

*Anacardium excelsum* (Bert. & Balb.) Skeels. ESPAUVÉ. A common large tree with entire leaves. The bark is used in some parts of Panama as a fish poison.

*Astronium graveolens* Jacq. ZORRO. A common tree with pinnate leaves having serrate or entire leaflets.

*Mangifera indica* L. MANGO. Naturalized and planted.

*Spondias mombin* L. HOGPLUM. JOBO. Tree with pinnate leaves and a juicy yellow edible fruit.

#### HIPPOCRATEACEAE. Hippocratea Family

*Hippocratea volubilis* L. Large woody vine, on the highest trees. The capsule is large, vertically compressed and nearly flat, and deeply 3-lobed.

*Salacia praecelsa* (Miers) Griseb. GARROTILLO. Large woody vine with globose fruit.

#### SAPINDACEAE. Soapberry Family

*Allophylus psilospermus* Radlk. Shrub or small tree with 3-foliolate leaves and winged fruit.

*Cupania cinerea* Poepp. GORGOJO, GORGOJERO. Shrub or small tree with pinnate leaves, whitish beneath.

*Cupania fulvida* Triana & Planch. CANDELILLO, GORGOJO, GORGOJERO. Shrub or small tree, often simple, densely brown-hirsute. The leaves are pinnate, but on young plants they are simple.

*Cupania latifolia* Kunth. Leaflets glabrous, rounded or retuse at apex.

*Cupania Seemanni* Triana & Planch. Leaflets glabrous, acuminate.

*Paullinia alata* Don. All the species of *Paullinia* are woody vines. They are used in tropical America as fish poisons.

*Paullinia bracteosa* Radlk.

*Paullinia glomerulosa* Radlk.

*Paullinia turbacensis* H. B. K.

*Serjania trachygona* Radlk. Woody vine.

*Talisia nervosa* Radlk. Small tree with very large, pinnate leaves.



## RHAMNACEAE. Buckthorn Family

*Gouania lupuloides* (L.) Urban. Woody vine.

*Gouania polygama* (Jacq.) Urban. JABONCILLO. Called "chewstick" in the West Indies. The stems when chewed produce lather.

## VITACEAE. Grape Family

*Cissus salutaris* H. B. K. Woody vine with 3-foliolate leaves and small red flowers.

*Cissus sicyoides* L. Vine with simple leaves. The inflorescences of this species are frequently distorted by a smut, *Mycosyrinx Cissi*.

*Vitis tiliaefolia* Humb. & Bonpl. GRAPE. UVA, BEJUCO DE AGUA. The fruit is small and very sour.

## TILIACEAE. Basswood Family

*Apeiba aspera* Aubl. Tree with entire leaves. Fruit resembling a sea-urchin, and covered with stiff spines.

*Apeiba tibourbou* Aubl. PEINE DE MICO, CORTEZO. Leaves finely dentate.

*Belotia panamensis* Pittier. Tree with very showy flowers, the sepals pink, the petals violet; fruit compressed, obcordate, 2-celled.

*Heliocarpus popayanensis* H. B. K. MAJAGÜILLO. Tree, the small flowers paniced; fruits very small, compressed, the margin bearing a row of stiff radiating hairs.

*Luehea Seemannii* Triana & Planch. GUÁCIMO. A common, very large forest tree; leaves tomentose beneath; fruit small, woody, obtusely 5-angled.

*Triumfetta lappula* L. CADILLO, CEPA DE CABALLO. Shrub bearing small globose spiny burs.

## MALVACEAE. Mallow Family

*Hibiscus rosa-sinensis* L. CHINESE HIBISCUS. PAPO, TAPO. Planted at the laboratory.

*Pavonia dasypetala* Turcz. Shrub with showy pink flowers 4 to 6 cm. long; leaves broad and velvety.

*Pavonia rosea* Schlecht. Herbaceous or suffrutescent, with small pink flowers; fruit armed with barbed spines.

*Sida rhombifolia* L. ESCOBILLA. One of the most common weedy plants of tropical America.

## BOMBACACEAE. Cotton-tree Family

*Bombacopsis Fendleri* (Seem.) Pittier. CEDRO ESPINOSO. Large tree with spiny trunk, flowering in winter when leafless.

*Bombacopsis sessilis* (Benth.) Pittier. CEIBO. Trunk unarmed.

*Cavanillesia platanifolia* H. B. K. CUIPO, BONGO, QUIPO. Large tree with smooth swollen trunk; leaves deciduous, 5 or 7-lobed; flowers small, with red petals. The trees are conspicuous when in flower, in late March and early April. The wood is very soft and light.

*Ochroma limonensis* Rowlee. BALSA. Large or medium-sized tree, the cordate leaves 3-angled or shallowly 3-lobed, pale beneath; flowers large and whitish. The balsa trees have one of the lightest woods known.

## STERCULIACEAE. Cacao Family

*Buettneria aculeata* Jacq. ESPINO HUECO, ZARZA, RABO DE IGUANA. Prickly shrub, often scandent; young leaves often blotched with silver.

*Sterculia apetala* (Jacq.) Karst. PANAMA. Large tree with 3 or 5-lobed leaves, stellate-tomentose beneath; flowers without petals, the large calyx 5-lobed, reddish; fruit of 5 carpels, the large brown seeds resembling chestnuts. It is from the Indian name of this tree that the Republic of Panama derives its name.

*Theobroma cacao* L. CACAO. Planted and also naturalized in the forest.

*Theobroma purpureum* Pittier. CACAO CIMARRÓN, CHOCOLATILLO. Shrub or small tree; leaves digitately compound, with 5 large leaflets; fruit small, covered with stiff hairs which penetrate the skin readily.

## DILLENIACEAE. Dillenia Family

*Davilla rugosa* Poir. Woody vine with rough, obovate, nearly entire leaves and yellow flowers.

*Dillenia indica* L. Planted at the laboratory. A handsome tree with large toothed obovate leaves, very large white flowers, and a huge globular green fruit.

*Dolioscarpus major* Gmel. Woody vine with glabrous but punctate leaves.

## OCHNACEAE. Ochna Family

*Ouratea Wrightii* (Van Tiegh.) Riley. Shrub with narrow lustrous leaves; flowers yellow, in terminal panicles; fruits several, black, borne on a red disk.

## HYPERICACEAE. St. Johnswort Family

*Vismia ferruginea* H. B. K. SANGRE DE PERRO. Shrub with ovate entire leaves, brownish beneath. The sap turns red upon exposure to the air.

## CLUSIACEAE. Clusia Family

*Calophyllum longifolium* Willd. MARÍA. Large tree with very handsome, narrow, oblong leaves, 30 cm. long or larger; sap yellowish.

*Clusia rosea* L. COPEY. Tree; leaves thick, nearly as broad as long; flowers pink, waxy; fruit a leathery fleshy capsule; sap milky, sticky.

*Rhedia madruno* (H. B. K.) Planch. & Triana. CERILLO, TOMÉ, MACHIARI. Tree with oblong to elliptic, acuminate leaves.

*Symphonia globulifera* L. f. CERILLO. Tree with small oblong-lanceolate leaves.

*Tovomitopsis nicaraguensis* (Oerst.) Triana & Planch. Shrub or small tree; flowers small, whitish.

## VIOLACEAE. Violet Family

*Hybanthus anomalus* (H. B. K.) Standl. Shrub with alternate leaves.

*Rinorea squamata* Blake. MOLENILLO. Shrub with opposite leaves.

*Rinorea sylvatica* (Seem.) Kuntze.

**FLACOURTIACEAE. Flacourtia Family**

*Casearia arguta* H. B. K. RASPA-LENGUA. Shrub.

*Casearia guianensis* (Aubl.) Urban. PALO DE LA CRUZ.

*Casearia nitida* (L.) Jacq. RASPA-LENGUA.

*Casearia sylvestris* Swartz. Shrub with entire leaves.

*Hasseltia floribunda* H. B. K. RASPA-LENGUA. Small tree with oblong to elliptic, coarsely serrate, glabrate leaves, and small white flowers.

*Oncoba laurina* (Presl) Warb. GUAVO CIMARRÓN, CARBONERO. Small tree with spiny globose fruit.

**TURNERACEAE. Turnera Family**

*Turnera panamensis* Urban. Shrub with lance-oblong leaves and yellow flowers.

**PASSIFLORACEAE. Passionflower Family**

*Passiflora aucticulata* H. B. K. Leaves ovate-lanceolate, 3-lobed or subentire.

*Passiflora vitifolia* H. B. K. GUATE-GUATE. A very showy species, a woody vine, with large, deep red flowers.

**CARICACEAE. Papaya Family**

*Carica papaya* L. PAPAYA. Planted at the laboratory; also wild or naturalized.

**BEGONIACEAE. Begonia Family**

*Begonia filipes* Benth. A small and inconspicuous plant.

**CACTACEAE. Cactus Family**

*Epiphyllum phyllanthus* (L.) Haw. An epiphytic spineless plant with large white flowers.

**LYTHRACEAE. Loosestrife Family**

*Adenaria floribunda* H. B. K. FRUTA DE PAVO. Shrub with entire, opposite, nearly sessile leaves.

**LECYTHIDACEAE. Brazilnut Family**

*Grias Fendleri* Seem. Tree with large sessile leaves, entire or nearly so.

*Gustavia superba* Berg. MEMBRILLO. Medium-sized tree with few branches; leaves 30 to 100 cm. long, serrate; flowers about 10 cm. broad, white; fruit edible. Common.

**RHIZOPHORACEAE. Mangrove Family**

*Cassipourea elliptica* Poir. HUESITO, LIMONCILLO. Shrub or small tree with glabrous entire opposite leaves.

**COMBRETACEAE. Combretum Family**

*Terminalia Hayesii* Pittier. AMARILLO REAL. A common large tree; leaves obovate, entire; flowers minute, green, in long spikes.

## MYRTACEAE. Myrtle Family

*Calycolpus Warscewiczianus* Berg. GUAYABILLO. Slender shrub with pink or whitish flowers.

*Eugenia uniflora* L. SURINAM CHERRY. A South American shrub, planted at the laboratory.

*Psidium guajava* L. GUAVA. GUAYABA. Frequent in open places.

## MELASTOMACEAE. Meadowbeauty Family

*Clidemia petiolata* (Rich.) DC. Shrub.

*Conostegia bracteata* Triana. Shrub.

*Conostegia speciosa* Naud. DOS CARAS, RASPA-LENGUA, FRUTA DE PAVA. Shrub.

*Heterotrichum octonum* (Bonpl.) DC. Shrub with 7 or 9-nerved, broadly ovate leaves.

*Miconia argentea* (Swartz) DC. DOS CARAS, CANILLO, PAPELILLO. Common shrub or small tree, with large broad leaves very white beneath.

*Miconia Beurlingii* Triana.

*Miconia lacera* (Humb. & Bonpl.) Naud. Common shrub.

*Miconia nervosa* (Smith) Triana.

*Miconia impetiolearis* (Swartz) Don. DOS CARAS, OREJA DE MULA. Leaves large, brownish beneath, sessile.

*Miconia lonchophylla* Naud.

*Mouriria parvifolia* Benth. ARRACHECHE. Shrub, glabrous throughout, with sessile entire ovate leaves and small axillary flowers.

*Ossaea diversifolia* (Naud.) Cogn. FRUTA DE PAVA. Shrub with pink or reddish flowers and small, black or purple fruit.

*Ossaea micrantha* (Swartz) Macfad.

*Tibouchina longifolia* (Vahl) Benth. Herb with small white flowers.

## ONAGRACEAE. Evening-primrose Family

*Jussiaea suffruticosa* L. A common herb with yellow flowers, growing in wet places.

## ARALIACEAE. Ginseng Family

*Dendropanax arboreum* (L.) Decaisne & Planch. VAQUERO. Small tree with entire or 3-lobed leaves.

*Didymopanax Morototoni* (Aubl.) Decaisne & Planch. MANGABÉ, GARGORÁN, PAVA. Large tree; leaves digitately compound, with 7 to 10 long-stalked entire acuminate leaflets, pale-tomentose beneath. Common.

*Nothopanax Guilfoylei* (Cogn. & Marché) Merrill. Planted at the laboratory. Shrub with pinnate white-margined leaves.

## MYRSINACEAE. Myrsine Family

*Ardisia compressa* H. B. K. Shrub with white or pinkish flowers and black juicy fruit.

*Ardisia myriodonta* Standl. Described from Barro Colorado. A small shrub.

*Stylogyne laevis* (Oerst.) Mez. Glabrous shrub with thick entire leaves; flowers white or pinkish, the branches of the panicle bright red.

*Stylogyne ramiflora* (Oerst.) Mez.

## SAPOTACEAE. Sapodilla Family

*Chrysophyllum cainito* L. STAR-APPLE. CAIMITO. Large tree; leaves covered beneath with silky golden-brown hairs; fruit edible. Common forest tree.

## LOGANIACEAE. Logania Family

*Spigelia Humboldtiana* Cham. & Schlecht. A small herb.

*Strychnos darrieniensis* Seem. Woody vine.

*Strychnos panamensis* Seem. CANJURA, FRUTA DE MURCIÉLAGO. Woody vine with nearly glabrous, entire leaves; fruit large, globose, with hard shell.

*Strychnos toxifera* Benth. A very hairy vine. This species furnishes curare poison, used by the Indians of Panama and elsewhere for poisoning their arrows.

## GENTIANACEAE. Gentian Family

*Leiphaimos simplex* (Griseb.) Standl. A small saprophyte, without any green coloration, the slender stem bearing a single pale blue flower; common in dark wet forest.

## APOCYNACEAE. Dogbane Family

*Odontadenia speciosa* Benth. NEGRILLO. Woody vine with large yellow flowers.

*Prestonia obovata* Standl. Woody vine with glabrous obovate leaves.

*Tabernaemontana grandiflora* Jacq. HUEVO DE GATO, LECHUGA, VENENILLO. Glabrous shrub with yellow flowers about 5 cm. long.

*Thevetia nitida* (H. B. K.) A. DC. COJÓN DE GATO, LAVAPERRO, HUEVO DE TIGRE. Shrub or small tree with thick obovate leaves, yellow flowers, and bright red fruit.

## ASCLEPIADACEAE. Milkweed Family

*Asclepias curassavica* L. NIÑO MUERTO, PASORÍN. Herb with red and orange flowers. The only species of *Asclepias* found in the region.

*Vincetoxicum pinguifolium* Standl. A herbaceous vine, known only from Barro Colorado.

## CONVOLVULACEAE. Morning-glory Family

*Maripa panamensis* Hensl. Large glabrous woody vine with oblong to ovate leaves.

*Rivea campanulata* (L.) House. BATATILLA. Large vine with broadly cordate leaves; flowers pink, 7 to 8 cm. long.

The genus *Ipomoea* must occur on the island, but I have no record of it.

## BORAGINACEAE. Borage Family

*Cordia alliodora* (Ruiz & Pav.) Cham. LAUREL. Tree with stellate-pubescent leaves and small but showy, white flowers. The nodes are often swollen, and inhabited by ants.

*Tournefortia obscura* A. DC. Small woody vine.

## VERBENACEAE. Verbena Family

*Petrea volubilis* Jacq. VIUDA, FLOR DE MAYO, FLOR DE LA CRUZ. Large woody vine with very showy racemes of purple-blue flowers.

## MENTHACEAE. Mint Family

*Coleus Blumei* Benth. COLEUS. POMPOLLUDA, CHONTADURA. Called by the West Indians "Jacob's-coat." Planted at the laboratory.

*Hyptis capitata* Jacq. SUSPIRO DE MONTE. A weedy herb.

*Salvia occidentalis* Swartz. A small weedy herb with minute blue flowers

## SOLANACEAE. Potato Family

*Capsicum annum* L. PEPPER. CHILE, AJÍ. Planted at the laboratory.

*Capsicum macrophyllum* (H. B. K.) Standl. PINTAMORA DE MONTE. Large coarse herb with bright red, cherry-like fruit.

*Cestrum panamense* Standl. Small tree with pale green, tubular flowers.

*Lycianthes Maxonii* Standl. Nearly glabrous, erect shrub with small violet flowers. The typical form of the species is known only from Barro Colorado, but a variety occurs in the forests beyond Panama City.

*Solanum allophyllum* (Miers) Standl. HIERBA DE GALLINAZO, HIERBA GALLOTA. Herb with entire or lobed leaves.

*Solanum bicolor* Willd. Unarmed shrub with long-stalked cymes of white flowers.

*Solanum diversifolium* Schlecht. FRIEGA-PLATO, HUEVO DE GATO. Called by the Barbadians "susumba." Erect prickly shrub.

*Solanum parcebarbatum* Bitter. Nearly glabrous, unarmed shrub. For this I have been given in Panama the name "sauco," but that name belongs properly to the genus *Sambucus*.

*Solanum scabrum* Vahl. FRIEGA-PLATO, ARAÑA-GATO. Large, very prickly, woody vine.

*Solanum* sp. Only imperfect material is available; probably an undescribed species.

## SCROPHULARIACEAE. Figwort Family

*Scoparia dulcis* L. ESCOBILLA AMARGA. Called "sweet broom" by the West Indians. Herbaceous or suffrutescent weed, with very small, white flowers.

*Stemodia parviflora* Ait. Small herb with blue flowers.

*Torenia crustacea* (L.) Cham. & Schlecht. Small weedy herb with blue-purple flowers.

## BIGNONIACEAE. Bignonia Family

*Adenocalymna flos-ardeae* Pittier. Woody vine, the leaflets with large yellow glands on the lower surface.

*Amphiloophium paniculatum* (L.) H. B. K. Leaflets covered with minute scales; flowers pink and white.

*Arrabidaea pachycalyx* Sprague. Leaflets white-tomentose beneath; flowers purple, small but in large panicles and very showy.

*Cydista aequinoctialis* (L.) Miers. Reported by Dodge. Nearly glabrous vine with pale purple flowers 5 to 8 cm. long.

*Jacaranda copaia* Don. PALO DE BUBA. Tree with twice-pinnate leaves and large, bluish, very showy flowers.

*Macfadyena uncinata* (Meyer) DC. Easily recognized by the sharp hooks terminating the tendrils; flowers pale yellow.

*Paragonia pyramidata* (Rich.) Bur. Woody vine; leaflets minutely lepidote beneath; flowers pink, 6 to 7.5 cm. long.

*Petastoma patelliferum* (Schlecht.) Miers. Reported by Dodge. Glabrate vine with purple flowers about 4 cm. long.

*Phryganocydia corymbosa* (Vent.) Bur. Nearly glabrous vine with handsome, bright pink flowers 6 to 9 cm. long.

*Tabebuia guayacan* (Seem.) Hemsl. GUAYACÁN. Tree with digitately compound leaves and large yellow flowers.

*Tabebuia pentaphylla* (L.) Hemsl. ROBLE, ROBLE DE SABANA. Tree with digitately compound, minutely lepidote leaves; flowers varying from pale to deep pink. When in full flower, this is one of the most beautiful of Central American trees.

#### GESNERIACEAE. Gesneria Family

*Achimenes panamensis* (Seem.) Hemsl. Small herb with white flowers.

*Columnnea purpurata* Hanst. Rare. Coarse suffrutescent plant with large, very hairy leaves, and bright red, axillary inflorescence.

*Drymonia spectabilis* (H. B. K.) Mart. Epiphytic shrub; corolla dull dark red.

*Kohleria tubiflora* (Cav.) Hanst. Herb with scarlet flowers.

*Tussacia Friedrichsthaliana* Hanst. Small herb with large orange flowers.

#### PINGUICULACEAE. Butterwort Family

*Utricularia mixta* Barnh. Small floating aquatic plant, in quiet water; flowers yellow.

#### ACANTHACEAE. Acanthus Family

*Aphelandra Sinclairiana* Nees. Showy shrub with bright red flowers in dense bracted spikes, the bracts orange-red.

*Aphelandra tetragona* (Vahl) Nees. Shrub with red flowers, the bracts small and green.

*Blechnum pyramidatum* (Lam.) Urban. Common herbaceous weed with small purple flowers.

*Blechnum panamense* Lindau. Herb with purple flowers.

*Chaetochlamys panamensis* Lindau. Erect herb with showy purple flowers.

*Mendoncia retusa* Turrill. Vine; flowers white, with purple veins; fruit a black plumlike drupe.

#### RUBIACEAE. Madder Family

*Alibertia edulis* (L. Rich.) A. Rich. LAGARTILLO, TROMPITO. Called "wild guava" by the West Indians. Shrub with sessile glabrous lance-oblong leaves; flowers small, clustered, sessile; fruit globose, 2.5 cm. in diameter. Young seedling plants, which are very common on the island, have the leaves handsomely striped or mottled with purple and pink.

*Bertiera guianensis* Aubl. Shrub with small, bright blue fruit.

*Borreria laevis* (Lam.) Griseb. Small weedy herb.

*Borreria latifolia* (Aubl.) Schum. Reported by Dodge. An herb with small white flowers.

*Borreria ocymoides* (Burm.) DC. Small annual herb.

*Cephaelis ipecacuanha* (Brot.) Rich. IPECAC. RAICILLA. A small glabrate plant, about 30 cm. high; leaves oblong; flowers small, white, in a single terminal head. Ipecac is obtained from the thickened roots.

*Cephaelis tomentosa* (Aubl.) Vahl. Shrub with very hairy leaves; flowers in a dense head, subtended by showy, bright red bracts.

*Faramaea occidentalis* (L.) Rich. HUESITO. Shrub with white flowers. In its general appearance and in its fruit this plant suggests coffee, to which it is related.

*Geophila herbacea* (L.) Schum. Creeping herb with heart-shaped leaves and small white flowers; fruit juicy, red or purple-black.

*Guettarda foliacea* Standl. Shrub with globose red fruit.

*Hamelia nodosa* Mart. & Gal. Shrub with orange-red flowers.

*Hemidiodia ocimifolia* (Willd.) Schum. A weedy herb.

*Isertia Haenkeana* DC. CANELITO. Showy shrub with large leaves and dense panicles of bright yellow and red, tubular flowers.

*Ixora coccinea* L. BUQUET DE NOBIA. Shrub with red flowers, planted at the laboratory.

*Oldenlandia corymbosa* L. Small herb with linear leaves and white or pinkish flowers.

*Palicourea guianensis* Aubl. Shrub; flowers yellow, in a terminal thyrse, its branches red or orange.

*Pentagonia macrophylla* Benth. HOJA DE MURCIÉLAGO. Shrub with very large, obovate leaves.

*Pentagonia pubescens* Standl. Common shrub.

*Posoqueria latifolia* (Rudge) Roem. & Schult. BOCA VIEJA, BORAJÓ, FRUTA DE MONO. Large shrub or small tree with broad thick leaves; flowers tubular, very slender, 12 to 16 cm. long.

*Psychotria brachiata* Swartz. The species of this genus are common shrubs of the forest.

*Psychotria calophylla* Standl. Reported by Dodge.

*Psychotria chagensis* Standl.

*Psychotria cuspidata* Bredem.

*Psychotria emetica* L. f. RAICILLA MACHO, RAICILLA. Small shrub, with axillary white flowers and blue fruit. The roots yield a kind of ipecac.

*Psychotria granadensis* Benth.

*Psychotria grandis* Swartz.

*Psychotria horizontalis* Swartz.

*Psychotria involucrata* Swartz.

*Psychotria limonensis* Krause.

*Psychotria marginata* Swartz.

*Psychotria micrantha* H. B. K.

*Psychotria patens* Swartz. GARRICILLO.

*Psychotria Pittieri* Standl. Fruit blue.

*Psychotria racemosa* (Aubl.) Willd. Fruit 5-celled; it is 2-celled in the other species.



*Randia armata* (Swartz) DC. ROSETILLO. Spiny shrub with large white flowers.

*Rudgea fimbriata* (Benth.) Standl. Shrub with sessile leaves.

*Uncaria tomentosa* (Willd.) DC. Woody vine armed with hooked spines; flowers yellowish, fragrant, in dense globose heads.

#### CUCURBITACEAE. Gourd Family

*Anguria Warscewiczii* Hook. f. Glabrous vine with 3-foliolate leaves; flowers small, with bright red petals.

*Cayaponia Poeppigii* Cogn. Fruit small, globose, 6-seeded.

*Cucurbita pepo* L. SQUASH. CALABAZO, SAPUYO. Planted at the laboratory.

*Gurania Seemanniana* Cogn.? BEJUCO PICADOR. Large herbaceous vine with red inflorescence.

*Gurania suberosa* Standl. Type from Barro Colorado. Large woody vine, climbing on high trees; stems covered with corky bark; flowers small, red, borne on the naked stems near the ground. The leaves have not been collected.

*Luffa cylindrica* (L.) Roem. SPONGEGOURD. CALABAZO. Vine with large yellow flowers. The interior of the fruit resembles a sponge, and may be used in the same manner.

*Melothria guadalupensis* (Spreng.) Cogn. SANDILLITA. Slender vine with small yellow flowers. The fruit resembles a small watermelon, and has the odor of cucumber.

*Posadaea sphaerocarpa* Cogn. BRUJITO. Herbaceous vine with a globose gourdlike fruit.

*Sicydium tannifolium* (H. B. K.) Cogn. Leaves nearly entire, softly pubescent; flowers minute, in large panicles; fruits small, black.

#### ASTERACEAE. Aster Family

*Baccharis trinervis* (Lam.) Pers. Shrub with dirty-white flowers.

*Bidens pilosa* L. CADILLO, SIRVULACA. Called "Spanish needles" by the West Indians.

*Chaptalia nutans* (L.) Polak. Leaves white-tomentose beneath, in a basal rosette; rays short, white to red-purple.

*Eclipta alba* (L.) Hassk. Small weedy herb.

*Emilia sonchifolia* (L.) DC. Small weedy herb with pale purple or pink, discoid heads.

*Erechtites hieracifolia* (L.) Raf. TABAQUILLO. Coarse herb with greenish discoid heads.

*Erigeron bonariensis* L. TABAQUILLO. Weedy herb with linear leaves.

*Erigeron spathulatus* Vahl. Weedy herb with spatulate or obovate leaves.

*Eupatorium macrophyllum* L. Coarse herb with greenish white heads.

*Eupatorium microstemon* Cass. Small annual with purple heads.

*Eupatorium odoratum* L. PALECA, HERBA DE CHIVA. Called "Christmas-bush" by the West Indians. Large herb or shrub with lavender flowers.

*Eupatorium Sinclairii* Benth. Weedy herb with purplish flowers.

*Mikania leiostachya* Benth. Herbaceous vine; heads in spikes.

*Mikania micrantha* H. B. K. Herbaceous vine; heads small, fragrant, whitish, in cymes.

*Neurolaena lobata* (L.) R. Br. CONTRAGAVILANA. Coarse herb with yellow heads.

*Pluchea purpurascens* (Swartz) DC. Viscid herb with purple heads; growing in shallow water at edge of lake.

*Porophyllum ruderale* (Jacq.) Cass. Glabrous annual with discoid heads of bronze flowers; rare here.

*Pseudelephantopus spicatus* (Juss.) Rohr. ESCOBILLA BLANCA, CHICORIA. Weedy herb with pale purple heads.

*Rolandra fruticosa* (L.) Kuntze. Coarse herb with 1-flowered white heads; leaves white-tomentose beneath.

*Tridax procumbens* L. Weedy procumbent annual herb with pale yellow heads.

*Vernonia canescens* H. B. K. HIERBA DE SAN JOSÉ. Heads pink or white.

*Vernonia cinerea* (L.) Less. Small weedy herb with purple heads; naturalized from the Old World.

*Vernonia patens* H. B. K. LENGUA DE VACA, LENGUA DE BUEY. Shrub with white heads.

*Wulffia baccata* (L. f.) Kuntze. Arching shrub with rough leaves; heads 2 cm. broad, with small yellow rays.