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SMITHSONIAN MISCELLANEOUS COLLECTIONS
VOLUME 78, NUMBER 8

THE FLORA OF BARRO COLORADO ISLAND, PANAMA

BY
PAUL C. STANLEY



(PUBLICATION 2914)

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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 peibebuyensis (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 hydnoides (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.

MOSSES

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 Family¹

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.

¹An 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.

Cyclopeltis 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 & Fée) 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.

Arthrostyidium 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 Sodiroyana 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 Warszewiczii 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.

Calyptrogyne 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 Warszewiczianus 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.

Anepsias 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.

Stenospermation 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 SAUNA. 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 cylindrical 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. BIJAJO. 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.

Pleiochachya 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 culebratum 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. AREOL 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, CHIOYBÁ, 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 Hensl. 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 (Benrl.) 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.

Toungateea 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 axiilaris (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 peduncularis 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. HERBA 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. *ESPAVÉ*. 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*. *JOB*. 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 præcelsa** (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, *Mycosyria Cissi*.

Vitis tiliifolia 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.

Rheedea madruno (H. B. K.) Planch. & Triana. CERILLO, TOMÉ, MACHARI. 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 auriculata 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 impetolaris (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 darienensis 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 Hemsl. 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. POMFOLLUDA, 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.

Amphilophium 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.

Columnea 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.
- Faramea 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 NOVIA. 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 subsessile 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 tamnifolium (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. CABILLO, 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.

Rechtites 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.



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