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USEFUL PLANTS OF AMAZONIAN ECUADOR

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

GRANT NO. LAC-0605-G-SS-7037-00

FINAL PROGRESS REPORT

15 APRIL 1988 - 15 APRIL 1991



BRADLEY C. BENNETT, Ph.D.
INSTITUTE OF ECONOMIC BOTANY
THE NEW YORK BOTANICAL GARDEN
BRONX, NEW YORK 10458-5126
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FIGURE 1. Agatha Antich and Juan Cristobal Antuash
discussing useful Shuar plants in the Shuar Centro Yukutais.



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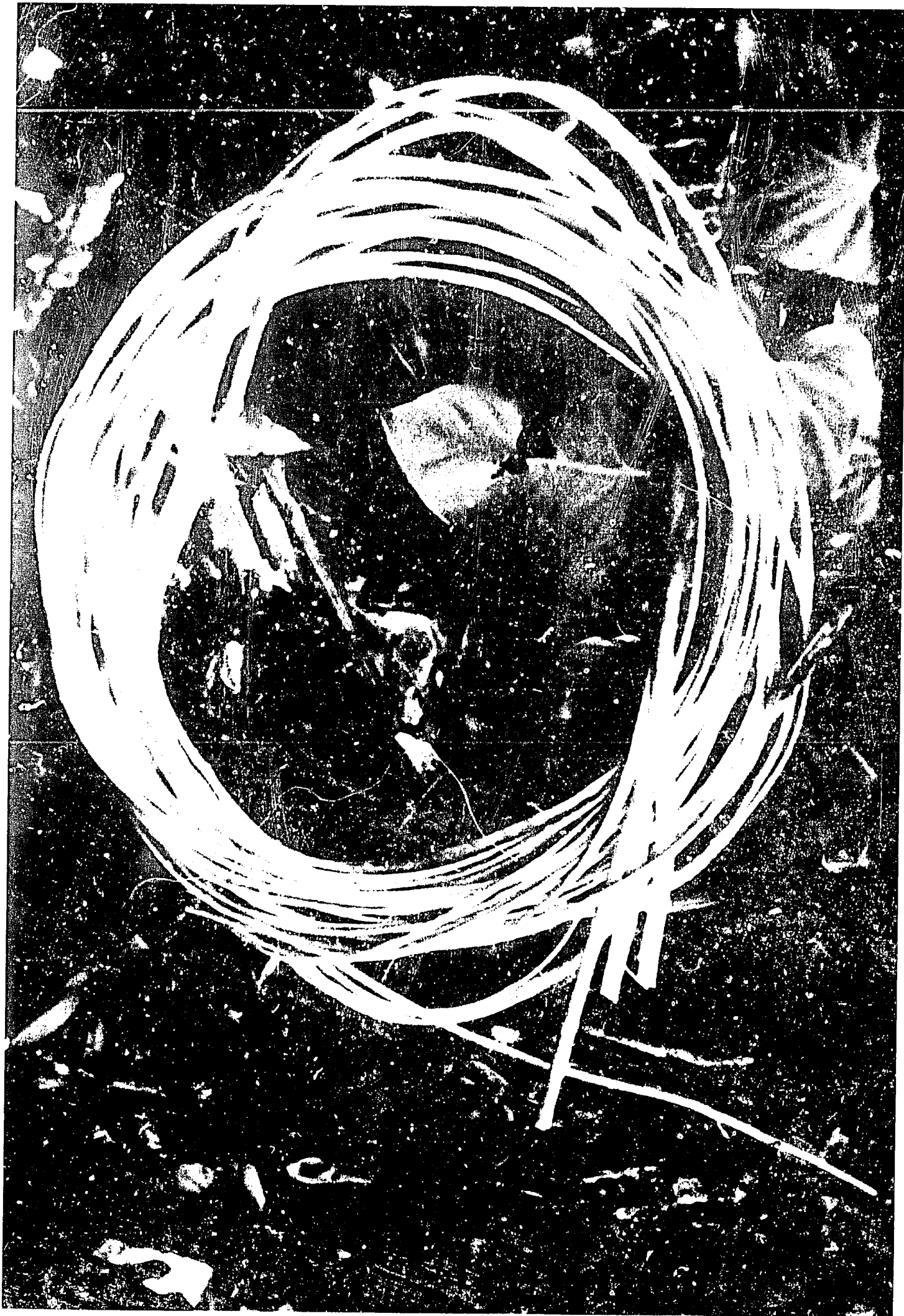
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Figure 2. Fibers obtained from the roots of an epiphytic Cyclanthaceae used by Quijos Quichuas to make baskets.



INTRODUCTION

In this report, we summarize the New York Botanical Garden's "Useful plants of Amazonian Ecuador Project." This project, which began in April 1988, is supported by U.S. Agency for International Development Grant No. LAC-0605-G-SS-7037-00. USAID granted a one-year, no-cost extension of the grant's termination until 15 April 1991.

Though only the size of Alabama, Amazonian Ecuador supports a diverse biota and a diverse indigenous population. For hundreds or perhaps thousands of years, humans have lived in Ecuador's lowland forests. Anthropologists commonly think of the tropical rainforest's effects in shaping culture. No doubt this is true, but lowland inhabitants have also shaped the forest. Through non-random harvesting, protection of useful species, artificial selection and manipulation of animal pollinators and dispersers humans change the species composition of forests. Our desire was to study the plants used by some Ecuador's lowland people and to examine the influence of humans on native vegetation.

Acculturation is proceeding rapidly in Ecuador. Of the seven indigenous groups in Amazonian Ecuador, all but one are largely acculturated. Within one generation we will lose most ethnobotanical knowledge. Because of the urgency of the problem, we chose to work with the two largest groups in Amazonian Ecuador: The Quichua and the Shuar. Lowland

Quichua, descendants of sierra Quichuas and now-extinct lowland cultures, number about 60,000. The Shuar, previously known by the pejorative Jivaro, number about 40,000.

The original proposal cited eight goals. We will discuss our success in fulfilling each of these, which we list below.

1. Collect plants from Amazonian Ecuador representing different life zones and land use patterns.
2. Prepare plant specimens and distribute them to selected Ecuadorian and foreign herbaria.
3. Identify and describe the collected plants.
4. Assess a selection of the native plant species with regard to economic importance and their potential for sustainable use.
5. Collect living material of economically important plants.
6. Provide botanical training for Ecuadorian scientist.
7. Prepare a database of useful species.
8. Promote and strengthen professional ties between Ecuadorian and foreign researchers.

Figure 3. Inga spectabilis fruits sold in a market in Sucúa in Morona-Santiago.



RESULTS

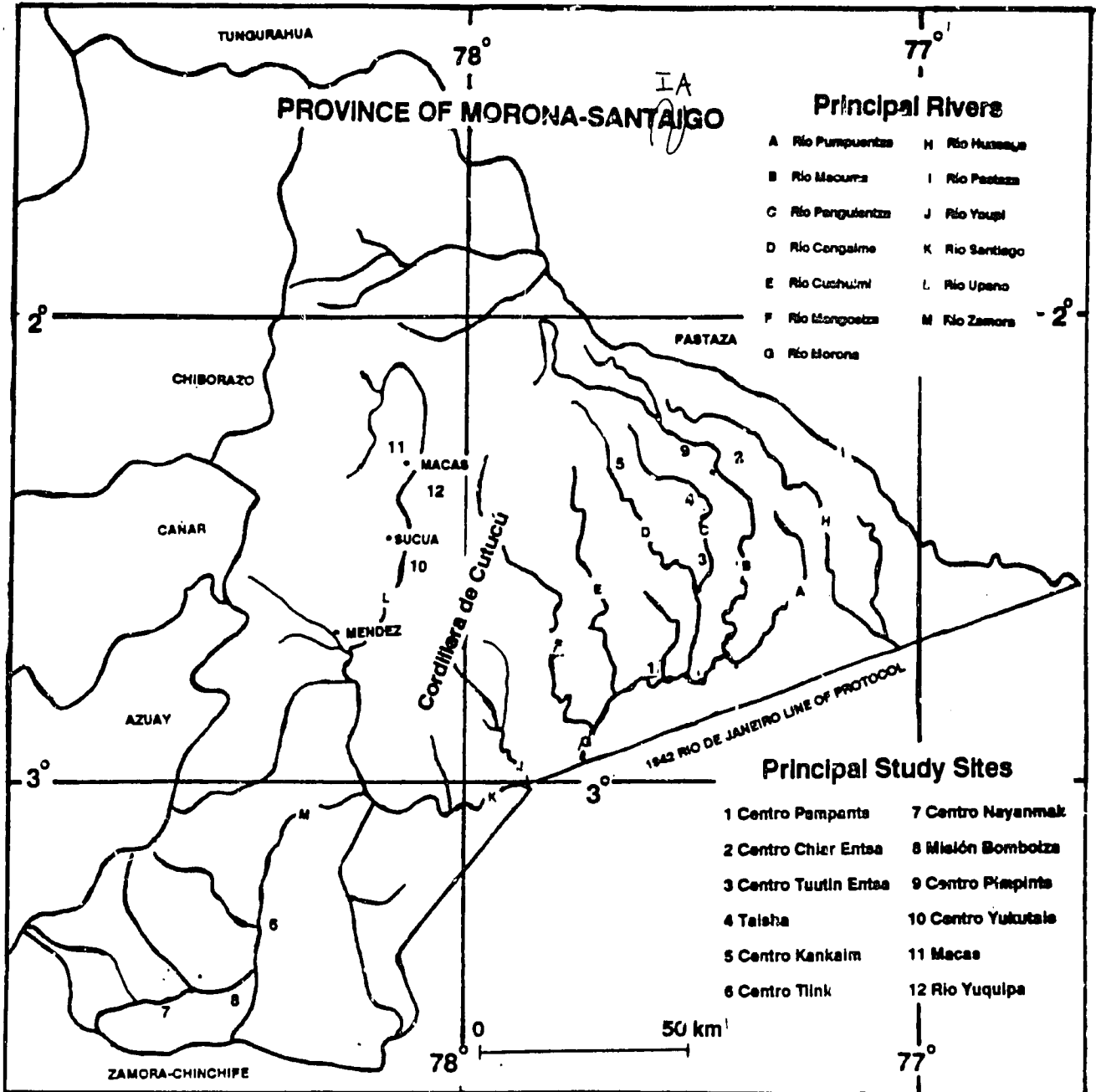
1. Collect plants from Amazonian Ecuador representing different life zones and land use patterns.

We collected 1462 numbers of plants used by the Untsuri Shuar and Quijos Quichua people of Amazonian Ecuador. We made an average of 5 duplicates of each, or more than 7300 sheets in total. Our study sites included montane forests, lowland forests, young secondary vegetation, inundated forests, cultivated fields and house gardens in the Napo and Morona-Santiago Provinces. Figure 4 shows the major collection sites.

2. Prepare plant specimens and distribute them to selected Ecuadorian and foreign herbaria.

We dried material in the field, when possible, before returning to Quito. Working in Quito's Herbario Nacional (QCNE), we made preliminary identifications. After depositing 1-3 specimens in QCNE, we shipped the remaining duplicates to New York (NY). Jan Stevenson managed the identification of the voucher specimens at NY. New York Botanical Garden's staff made further determinations. If specialists were not available at NY, we sent the specimens to taxonomists at other botanical institutions. The Garden's worldwide network of taxonomic experts made accurate determinations possible. The following taxonomists aided in identifying specimens. J. Brandbyge, L. Holm-

Figure 4. Principal study sites in Amazonian Ecuador.



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Nielsen and J. Madsen (AAU), B. Morley (AD), S. Botta (Buenos, Aires), L. Landrum (ASU), C. Berg (BG), K. Rahn (C), V. Rudd (Reseda, CA), G. Webster (DAV), M. Huft (F/MO), D. Austin (FAU), A. Meerow (FTG), L. Andersson, U. Eliasson, G. Harling and B. Stähl (GB), R. Callejas (HUA), W. Rodrigues (INPA), M. Coode, R. Harley, C. Jeffrey, T. Pennington and G. Prance (K), S. Graham (KE), W. Meijer (KY), A. Delgado (MEXU), W. Anderson and B. Gates (MICH), T. Croat, G. Davidse, C. Dodson, E. Forero, A. Gentry, R. Gereau, D. Neill, J. Pipoly, P. Raven, D. Stevens, H. van der Werff (MO), V. Badillo (MY), G. Tucker (NY State Museum), R. Barneby, L. Barnett, H. Beck, B. Boom, D. Daly, E. Dean, L. Dorr, J. Grimes, A. Henderson, J. Kallunki, T. Koyama, J. Luteyn, J. Mickel, J. Mitchell, S. Mori, M. Nee, J. Pruski, W. Thomas, and K. Vincent (NY), C. Sastre (P), A. Peixoto (RB), E. Christenson (SEL), P. Fryxell (TAES), W. Hekking and P. Maas (U), H. Kennedy (UBC), L. Constance and T. Duncan (UC), D. Baer (UCLA), H. Hopkins (UPNG), P. Acevedro-Rodrigues, J. Cuatrecasas, R. Faden, M. Poston, H. Robinson, L. Skog, L.B. Smith, M.A. Spencer, D. Wasshausen and J. Wurdack (US), B. Hansen and R. Wunderlin (USF), J. Kuijt (LEA), R. Kral (VDB), A.J.M. Leeuwenberg (WAG) and W. Alverson (WIS).

Figure 5. Pholidostachys syanthera (Martius) Moore leaves collected from montane forest to be used for roof thatch.



We have sorted and shipped all material collected to NY and distributed specimens to taxonomic experts around the world. Final determinations will be complete within a year.

3. Identify and describe the collected plants.

During the first phase of research, we studied useful plants of the Untsuri Shuar. With data from a previous USAID-funded study, we have more than 9000 sheets representing 985 morpho-taxa. We have identified 562 of the taxa to species, 260 to genus, 133 to family and 30 to division. The Shuar use 673 of these 985 taxa. Medicinal (245), food (196) and forage (134) are the most frequent uses. Ten families contained 15 or more species used by the Shuar: Araceae (24), Arecaceae (29), Asteraceae (16) Fabaceae sensu latu (40), Melastomataceae (23), Moraceae (19), Piperaceae (19), Poaceae (15), Rubiaceae (26) and Solanaceae (29).

We recently completed a 600 page monograph on Shuar ethnobotany that we will publish in *Advances in Economic Botany*. A sample from the Shuar manuscript appears in Table 1. Identification and description of the Quichua plants continue.

Table 1. Sample species descriptions from Useful plants of the Untsuri Shuar manuscript.

Virola sebifera Aublet

Centro Yukutais. Primary-forest tree; 20 m tall.

TSEMPU [tsempu myristicaceous tree] - Bennett 3649;

Informants: GS, DA & AA; MK & RN.

CUMALA [Spanish] - (Soukup 1970).

1. Construction, Forage. The wood is used to build houses. Birds eat the fruits.
2. Fuel, Personal. The seed oil is used for candles and soap (Mabberley 1987).

Solanum americanum Miller

Centros Kankaim, Pimpints and Yukutais. Common chacra weed; to 1.5 m tall.

SHIMPISHPI [unanalyzable constituent] - Bennett 3484;

Informant: JA.

SHIMPISHPISH [unanalyzable constituent] - Kasent 45;

Informant: PWK.

WAMPISHKUR [wampishkur skin infection] - Shiki 143;

Informant: DS.

1. Food, Medicine. Children eat the fruits (JA). The leaves are placed in water then boiled until the water becomes dark. The solution is used to bathe patients with patamar (smallpox) or wampishtias. Fruits are mixed with an INIAKU [Gustavia macarenensis] extract then boiled for 20 minutes. The mixture is collected on cotton or CEIBO [Ceiba sp.] seed hairs and the swab is applied to burrowing larvae (perhaps botflies) for 3 hours (DS).
2. Medicine. The Shuar use SHIMPISHPISH to treat wampishkur (small pox or chicken pox), skin rashes, and used in hot baths (Broseghini and Frucci 1986).

4. Assess a selection of the native plant species with regard to economic importance and their potential for sustainable use.

We classified Shuar useful plants into 19 major categories (Table 2) and will use the same classification for the remaining data. One goal of this classification is

to help end users quickly find data. Among the categories is commercial use, showing plants that have market value. Evaluation of the economic potential of plant resources is a three step process. Identification of economically important species is the first step. Second, we measure the abundance of these species. Third we estimate their economic value and production.

The first phase is well-under way but we will never complete it. We are continually identifying new economically important species. Many of these are new species to science as well. Acculturation and rainforest destruction, however, are proceeding more rapidly than is our efforts to record ethnobotanical knowledge. A new USAID grant will permit us to concentrate on the second and third aspects of this process.

Table 2. Major use categories and the number of species found in each (data from the Shuar).

| Use category | Number of species |
|-----------------|-------------------|
| Commercial | 31 |
| Construction | 88 |
| Craft | 19 |
| Dye/Paint | 11 |
| Fiber | 26 |
| Fishing | 9 |
| Food | 196 |
| Food processing | 23 |
| Forage | 134 |
| Fuel | 90 |
| Hunting | 28 |
| Ornamental | 21 |
| Medicine | 245 |
| Personal | 27 |
| Poison | 16 |
| Ritual/Mythical | 37 |
| Tools | 7 |
| Veterinary | 25 |
| Miscellaneous | 16 |

As an outgrowth of this project, we are collaborating with the National Cancer Institute in their search for biodynamic compounds from tropical plants. We are also initiating a project with Kraft General Foods to explore the commercial use of native fruits from Amazonian Ecuador.

At the request of Conoco Ecuador, Ltd., we designed a project to revegetate their planned roadway and well sites in the Yasuni National Park. Unlike most revegetation projects, we proposed to replant with fruit- and latex-producing species. Indigenous forest inhabitants could harvest these continually without destroying the forest.

Advantages of this system are several. We could choose species based on their economic potential, perhaps creating sustainable systems producing greater yields than unaltered forest. Roadside plantings would provide easy access to market, alleviating one problem facing resource extraction. A belt of vegetation along the roadway also would protect the forest. Indigenous people would be less likely to cut primary forest. Colonists would be less likely to occupy the area. While they could clear secondary forests with impunity they could not cut indigenous forest-gardens. Moreover, this option is the most likely to maintain traditional cultures.

We also have worked with the SUBIR (Sustainable Uses of Biological Resources) design team. The team has our previous reports and data from this project. SUBIR is interested in developing programs using Ecuador's native plant resources. NYBG staff will continue to develop new projects in collaboration with SUBIR.

5. Collect living material of economically important plants.

We have not collected living material. At present there are few facilities in Ecuador to handle living material.

6. Provide supervised training in botanical methods for Ecuadorian scientist.

Three Ecuadorian researchers worked closely with us in the field: Patricia Gómez and Efraim Freire of MECN (Museo Ecuatoriano de Ciencias Naturales) and Rocío Alarcón of Fundación Natura now working for NYBG. Gómez is a coauthor of the Shuar manuscript. Alarcón is coauthoring several papers with Bennett, including a monograph of Quijos Quichua ethnobotany.

Five Ecuadorian students worked in herbaria in Quito, learning to identify and process plants and record ethnobotanical data. Twelve Ecuadorian students participated in ethnobotany field courses taught by Bennett and Alarcón. Ecuadorians studied with American students for

Figure 6. New York Botanical Garden president Gregory Long discussing plants with a Pascual Tapuy, a Quijos Quichua shaman, and his wife Maria Cerda.



periods of 4 weeks in the summer of 1989 and 1990. Several of those Ecuadorian students are now working full-time on botanical projects in Ecuador.

7. Prepare a database of useful species.

We developed a database of useful Shuar plants. As we process the Quichua material we will add that data. With additional funding we hope to develop a reference database. Non-specialist could then quickly locate references and data on Ecuador's useful plant species. A sample of the data base appears in Table 3.

8. Promote and strengthen professional ties with Ecuadorian and foreign researchers.

Bennett worked closely with MECN's Herbario Nacional. Ing. Miguel Moreno, MECN's director, named Bennett an honorary curator of the National Herbarium in 1990. NYBG donated books, supplies and field equipment to the Herbario Nacional and paid the salary of some MECN workers. Herbarium personnel in Quito are using a computer, purchased with grant funds, to manage specimens related to this and other projects. Bennett also worked with staff and students at Universidad Catolica in Quito and Fundación Ecociencia.

Table 3. Sample data from Shuar database.

ha - habitat: e = epiphyte h = herb, s = shrub, t = tree

cu - cultivated: n = no, y = yes

USE: CM = commercial

CN = construction

CR = craft

DP = dye/paint

FI = fiber

FS = fishing

FO = food

FP = food processing

FR = forage

FU = fuel

HU = hunting

OR = ornamental

ME = medicinal

PE = personal

PO = poison

RM = ritual/mythical

TO = tools

VE = veterinary

MI = miscellaneous

Sample data from Shuar database.

| FAMILY | GENUS | ha | cu | CM | CN | CR | DP | FI | FS | FO | FP | FR | FU | HU | OR | MC | PE | PO | RM | TO | VE | MI |
|--------|----------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| ACA | Aphelandra aurantiaca | s | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y |
| ACA | Aphelandra sp. 1 | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Aphelandra sp. 2 | s | n | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N |
| ACA | Fittonia albivenis | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | Y | N |
| ACA | Fittonia sp. | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | Y | N |
| ACA | Jururasia rotundata | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Justicia pectoralis | h | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | Y | N | N | N | Y | N |
| ACA | Justicia polygonoides | h | n | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Justicia sp. 1 | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N |
| ACA | Pachystachys sp. | s | n | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N |
| ACA | Pseuderanthemum sp. | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y |
| ACA | Ruellia chartacea | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Sanchezia sericea | s | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Sanchezia sp. | v | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | Teliostachya lanceolata | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N |
| ACA | genus indet. 1 | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | genus indet. 2 | v | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | genus indet. 3 | n | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ACA | genus indet. 4 | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | Y | N |
| AGA | Cordyline fruticosa | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | Y | N | N | N |
| AMA | Achyranthes aspera | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | Aerva sanguinolenta | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | Alternanthera bettzichiana | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | Y |
| AMA | Alternanthera mexicana | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | Amaranthus caudatus | h | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | Amaranthus sp. | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | Cyathula achyranthoides | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N |
| AMA | genus indet. 1 | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AMA | genus indet. 2 | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y |
| AMA | genus indet. 3 | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | Y |
| AMA | Spondias mombin | t | n | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N |
| AMA | Tapirira guianensis | t | n | N | Y | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| ANN | Annona cf. cherimola | t | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| ANN | Crematosperma sp. | t | n | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N |
| ANN | Guatteria sp. | t | n | Y | Y | N | N | Y | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| ANN | cf. Guatteria sp. | t | n | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ANN | Rollinia sp. | t | n | Y | Y | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| ANN | Unopsis sp. | t | n | Y | Y | N | N | Y | N | N | N | N | Y | N | N | N | N | N | N | N | N | N |
| ANN | genus indet. 1 | t | n | N | N | N | N | Y | N | Y | N | N | Y | N | N | N | N | N | N | N | N | N |
| ANN | genus indet. 2 | t | n | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| API | Anethum graveolens | h | y | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N |
| API | Arracacia xanthorrhiza | h | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| API | Daucus carota | h | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | Y | N | N | N | N | Y |
| API | Eryngium foetidum | h | y | N | N | N | N | N | N | Y | N | N | N | N | N | N | Y | N | N | N | N | N |
| API | Spananthe paniculata | h | n | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N |
| APO | Aspidosperma veruculosum | t | n | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| APO | Aspidosperma sp. | t | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| APO | cf. Aspidosperma sp. | t | n | N | N | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | Y | N |
| APO | Lacmella sp. | t | n | N | N | N | N | N | N | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| APO | Tabernaemontana sanaho | t | n | N | N | N | N | N | N | Y | N | N | N | N | N | N | Y | N | N | N | N | Y |
| APO | Tabernaemontana sp. | t | n | N | N | N | N | N | N | N | N | N | N | N | N | N | Y | N | N | N | N | N |
| APO | genus indet. | t | n | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| AQU | Ilex guayusa | t | y | N | N | N | N | N | f | N | N | N | N | N | f | N | N | f | N | N | N | N |

9. Other accomplishments.

Manual on Useful Plants. A major goal of NYBG is to publish a manual on Amazonian Ecuador's useful plants. This work will incorporate data from our fieldwork, herbarium studies, and ethnobotanical publications. Bennett continues pursuing that goal. A contract with the publisher Dioscorides is pending. Because of the many useful plants, it will be another 12-24 months before we complete the book. A sample description appears in Table 4.

Table 4. Sample description of Bixaceae for the Useful plants of Amazonian Ecuador manuscript.

BIXACEAE

Bixa arborea Huber

Rain forest tree of central Amazon basin.

Spanish: achiotillo [small achiote] - Neill 1987: Neill 6931

Bixa orellana Linnaeus

Synonyms: B. odorata R. & P. ex G. Don.
Orellana orellana (L.) O. Ktze.

Uses: dye-paint (seed aril), food (seed), and medicine (seed aril, leaves, stem)

Commonly cultivated shrub to 8 m. Leaves alternate, simple to 24 x 17 cm. Corolla white or pink, petals to 3.5 x 1.7 cm. Fruits ovoid, red or green, to 6.5 cm usually bearing soft spines. A spineless variety also occurs (Molau 1983). B. orellana may be native to Ecuador but is now widely distributed in the neotropics. Source of annatto.

English: annatto

Spanish: achiote

achiote de monte [montane forest achiote] - Neill 1987: Nowak 92

Kofan: kɨ"ɑ kɨna [red achiote] - Pinkley 1973: Pinkley 7B

inzɨpak'o [yellowish tree achiote] - Pinkley 1973: Pinkley 7A

tsanda kɨna [storm achiote] - Pinkley 1973: Pinkley 542

inszia kɨna [yellowish achiote] - Pinkley 1973: Pinkley 541

pachu'a cuna - Neill 1987: Lugo 1014

Quichua: manduru - [achiote] - Alarcón 1988: Alarcón 17
achiwiti (Peru)

achihuiti (Peru)

Secoya: su'nyo bosa [yellow achiote] - V: Vickers 241

Siona: bayo bosa [oily achiote] - V: Vickers 240

muhu bosa [thunder achiote] - V: Vickers 241

Shuar: ipiak, ipiaku [achiote] - Bennett ms: Bennett 3466

Waorani: caca [achiote] - Davis and Yost 1983: Davis & Yost 1013

All six major tribes extract a red coloring from the seed (aril) to use as a dye or body paint (A,B,D,L,P,V). Blowguns, spears, pottery, cloth, and food are colored with achiote. Body paints are made by mixing achiote with animal or vegetable oils. Colonists in the oriente also cultivate Bixa orellana. In Ecuador, Colombia, and Peru it has been an important export (Perez-Arbelaez). A food dye made from Bixa is used to color butter, margarine, cheese, and chocolate (Purseglove 1968). The plant also has medicinal value. Quichuas macerate the stem in water, allow the mixture to sit overnight, and then add a drop to each eye to treat "mal de ojos" or conjunctivitis (A). Quichua women drink a decoction made from achiote leaves to regain strength after giving birth (L). The Shuar treat "mal de piel" (probably a fungal infection of the skin) with Bixa seeds. They also flavor soups with the seeds (B).

Aztecs added ground achiote seeds to a drink they made from cacao (Simpson and Conner-Ogorzaly 1968). The Chacobo Indians of Bolivia eat achiote seeds after cooking them in butter and treat body pains by pressing leaves against the ailing area (Boom 1987). Schultes (cited in D) reports that the root is considered a digestive aid and that the seeds may be used as an expectorant. Perez-Arbelaez mentions the use of B. orellana to treat kidney problems and as an aphrodisiac. Duke (1970) and Garcia-Barriga (19775) also report the latter use. Other medicinal uses include the treatment of wounds (Lipp 1971) and purgatives (Delascio-Chitty 1978). Standley (cited in Soukup 1970) mentions its use as an astringent, antipyretic, diuretic, aphrodisiac and also notes its use to treat venereal disease, dysentery, fevers, epilepsy, erysipelas, burns, and sore throats.

Bixa platycarpa Ruiz & Pavón ex G.Don

Uses: paint and dye (seeds, stem), personal (seeds, stem)

Tree 10-35 m tall of the primary forest. Leaves broadly ovate to 28 cm by 22 cm. Corolla white, petals to 3 cm long. Fruits red-brown to 4 cm wide. Western Amazon Basin including Brazil and Peru.

Spanish: achiotillo [little achiote] - Neill 1987: Lugo 1014

Quichua: achiote caspi - Soukup 1970

Peruvian Indians use the yellow sap from the seeds and stem as a body paint and as an insect repellent.

Bixa urucurana Willd.

Tree to 10 m tall. Leaves to 20 by 14 cm. Corolla white or pink, petals to 2.0 by 1.0 cm. Fruits brownish red, subglobose to 3 cm. Native to western Amazon Basin in primary and disturbed lowland rainforest.

Spanish: urucu rana (Soukup 1970)
achiote blanco (Soukup 1970)

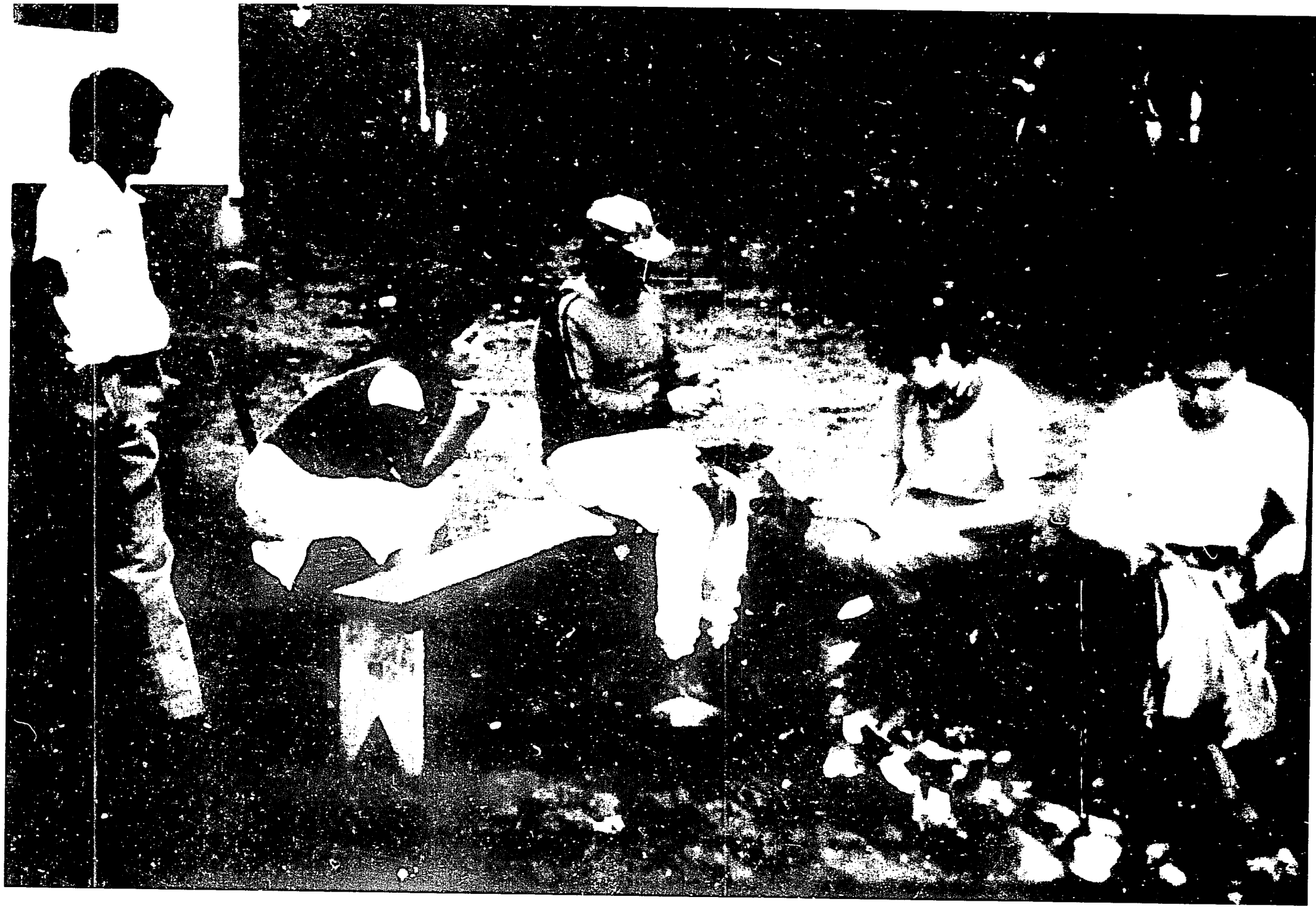
Bixa sp.

Siona: pon-sa - Neill 1987: Balslev 4638
Woorani: ratowae - Neill 1987: Oldeman 29

Taxonomic References

- Molau, U. 1983. Bixaceae. In G. Harling and B. Sparre (eds.), Flora of Ecuador 20:3-7.
- MacBride, F. 1941. Bixa L. In Flora of Peru, Field Museum Botanical Series 13(4):10-13.
- Standley and Williams. 1961. Bixaceae. Flora of Guatemala, Fieldiana Bot. 24(7):65-67.

Figure 7. Efraim Freire and Patricia Gómez discussing plants with Pedro Kunkumas, a Shuar shaman, his wife Maria and nephew Pedro.



Bennett commissioned an Ecuadorian artist, Alejandro Suarez, to make illustrations for the text. To date Suarez has completed 97. Five of these follow. A sixth, Bactris gasipaes Kunth, appears on the cover. Known as chonta in Quichua and uwi in Shuar, it is one of the Amazon's most important palms.

Brugmansia sauveolens (H. & B. ex Willd.) Bercht. & Presl

ENGLISH: ANGEL'S TRUMPET

QUICHUA: GUANDU

SHUAR: MAIKUA [maikua Brugmansia sp.]

SPANISH: FLORIPONDIO

USES: Medicine, Ornamental



Malvaviscus penduliflorus de Candolle

ENGLISH: TURK'S CAP MALLOW

SPANISH: PEREGRINO

USES: Medicine, Ornamental



Nicotiana tabacum L.

ENGLISH: TOBACCO

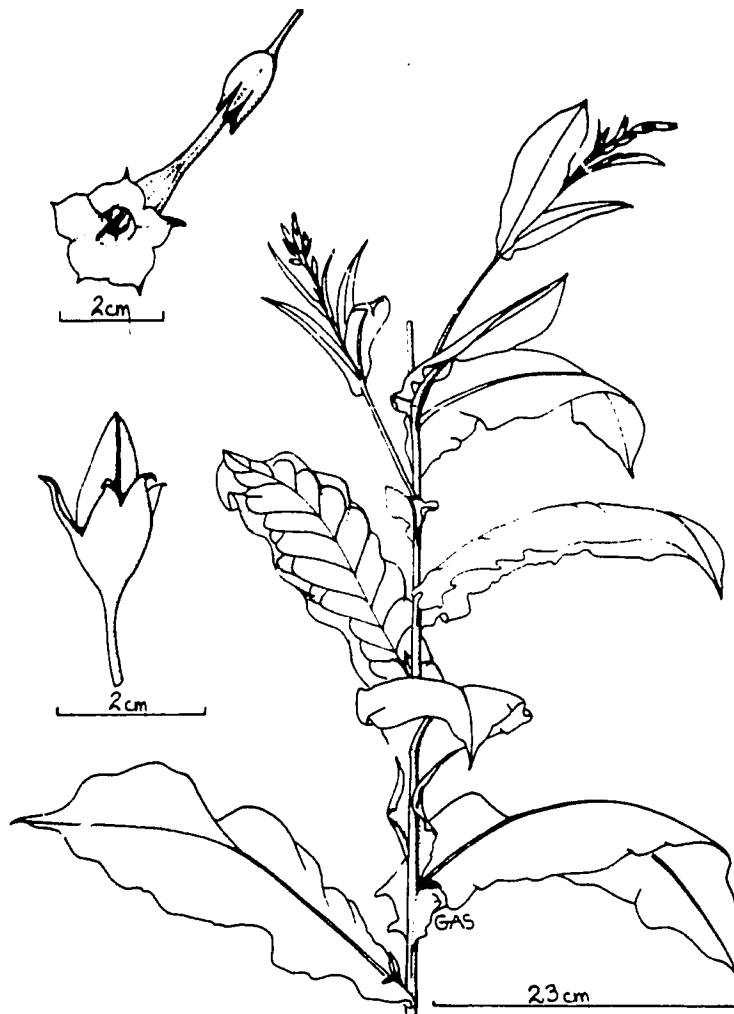
QUICHUA: TAHUACO

SHUAR: TSAANK [tsaank "tobacco"]

SIONA: MITO

SPANISH: TABACO

USES: Medicine, Ritual/Mythical.



Pourouma guianensis Aubl.

SHUAR: SHUINA [shuina Pourouma sp.]

SPANISH: UVA DE MONTE [Spanish: "mountain grape"]

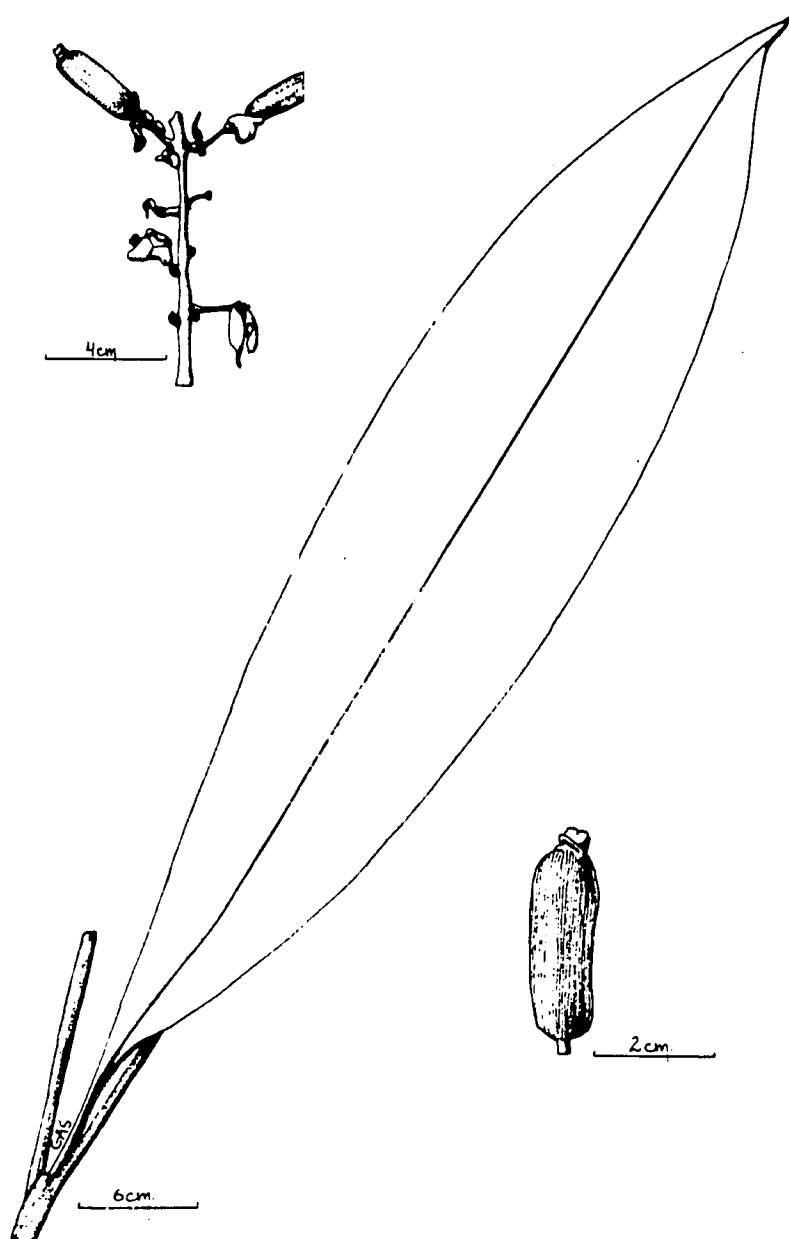
USES: Food, Forage, Fuel



Renealmia alpinia (Rottb.) Maas

SHUAR: KUMPIA

USES: Food, Food Preparation, Medicine.



Presentations. Bennett gave four presentations at international meetings about the USAID-supported research in Ecuador, including two in Ecuador. He spoke at Yale University, the University of North Carolina and the New York Botanical Garden. Bennett also talked to six elementary school groups about tropical rainforests in Ecuador. In March, he spoke to Ecuador's Peace Corp volunteers about ethnobotanical research in tropical Ecuador. We list the titles of some of these presentations below.

1. Indigenous resource management in Amazonia. University of North Carolina, Department of Biology. 10 February 1990.
2. La variación en los nombres y los usos de las plantas entre las Shuaras. Primer Simposio Ecuatoriano de Etnobotánica y Botánica Económica. Quito, Ecuador. 2 March 1990.
3. Panel discussion. El futuro de la Etnobotánica y Desarrollo Socioeconómica. Primer Simposio Ecuatoriano de Etnobotánica y Botánica Económica. Quito, Ecuador. 1 March 1990.
4. Landscape ecology in Amazonian Ecuador. University of North Carolina, Department of Geography, 14 April 1990.
5. New York Botanical Garden's Research Program in Amazonian Ecuador. The New York Botanical Garden. May 1990.

6. Variation in common plant names and uses among the Shuar in Ecuador. Society for Economic Botany, Madison, WI. 12 June 1990.
7. Ethnobotanical research in Amazonian Ecuador. University of North Carolina, Department of Biology. 18 October 1990.
8. Plant resources of Amazonian Ecuador. Yale School of Forestry and Environmental Studies. 20 January 1991.
9. Conducting ethnobotanical research in lowland Ecuador. Peace Corp Forestry Training Program. Quito, Ecuador. 15 March 1991.
10. Uses of epiphytes, lianas, and parasites by the Shuar people of Amazonian Ecuador. The Biology And Conservation Of Epiphytes. Marie Selby Botanical Garden, Sarasota, FL. 7 May 1991.

Publications. As taxonomic specialists complete the identifications, we will publish a series of papers, monographs, and books detailing our research. We list the status of some of these below.

Publications in press:

1. La variación en los nombres y los usos de las plantas entre los Shuaras. Memorias del Primer Simposio Ecuatoriano de Etnobotánica y Botánica Económica.

2. El futuro de la etnobotánica y desarrollo socioeconómica. Memorias del Primer Simposio Ecuatoriano de Etnobotánica y Botánica Económica.

Publications submitted:

3. Ethnobotany of the Untsuri Shuar. (Advances in Economic Botany)
4. Uses of epiphytes, lianas, and parasites by the Shuar people of Amazonian Ecuador. (Selbyana).
5. The Ethnobotany of Carludovica palmata Ruiz & Pavón (Cyclanthaceae) in Amazonian Ecuador (with R. Alarcón² and C. Cerón) (Economic Botany)

Publications in preparation:

6. Common useful plants of Amazonian Ecuador.
7. Plant Resources of Amazonian Ecuador. (to be published with Dioscorides Press, contract pending).
8. Medicinal plants of the Shuar.
9. Ethnobotany of the Quijos Quichuas.
10. Medicinal uses of common cultivars of the Quijos Quichua.

Figure 8. Woman from Sucúa showing a broom made from the fibers of the adjacent palm Aphelandra natalia.



SUMMARY

During three years of research we have collected 1462 specimens used by Ecuador's indigenous inhabitants. We identified 562 species used by the Untsuri Shuar. This represents 50% or less of the plants used by the Shuar. We have begun assessing the economic potential of some of these plants. This work continues in NYBG's new USAID-funded project.

Nearly 20 Ecuadorians received training with project funds. Many of these Ecuadorians are now active researchers and technicians in their country. We developed close affiliation with the Museo Ecuatoriano de Ciencias Naturales and the Herbario Nacional in Quito. This collaboration continues. Bennett made 10 presentations about the research in Ecuador including four at international meetings. We have two publications in press, submitted three others and are preparing five more.

We continue our work in Ecuador, in part with the support of USAID. We also are participating in the SUBIR project. Additionally, we hope to find funding to develop an ethnobiological field station in Ecuador. This would be the first of its kind. An ethnobiological research station would permit Ecuadorian and foreign researchers to work closely with indigenous people. More important.

planning and direction, the research station would reduce cultural conflicts and protect the rights of the indigenous people.

We also are looking for ways to use Ecuador's plant resources in sustainable manners. This process will involve the development of local, regional, national, and international markets. To reduce the exploitation that has marked the history of tropical forest extraction. We hope that the sequence of development proceeds in that order.

Figure 9. Carludovica palmata Ruiz & Pavón, known as paja toquilla in Spanish or the Panama hat palm in English. Fibers from the leaves and stem are used to make "Panama" hats, fish traps and baskets. The leaves are used for thatch. Young leaf buds and fruits are edible.



USEFUL PLANTS OF AMAZONIAN ECUADOR
SPECIES LIST

ACANTHACEAE

Aphelandra aurantiaca (Scheidw.) Lind.
Aphelandra crispata Leonard
Aphelandra spp.
Fittonia albivenis (Lind. ex Veit.) Brum.
Fittonia argyroneura [see *F. albivenis*]
Fittonia verschaffeltii (Lem.) Coem.
Fittonia spp.
Jururasia rotundata Lindau
Justicia pectoralis Jacq.
Justicia polygonoides H.B.K.
Justicia spp.
Pachystachys sp.
Pseuderanthemum sp.
Ruellia chartacea (T.Anders.) Wasshausen
Ruellia colorata Baillon [*R. chartacea*]
Ruellia riopalenquensis Wassh.
Ruellia sp.
Sanchezia oxysepala Mildbr.
Sanchezia sericea Leonard
Sanchezia sp.
Teliostachya lanceolata Nees
Tetramerium nervosum Nees
genus indet.

ACTINIDIACEAE

Saurauia herthae Sleumer
Saurauia prainiana Busc. var. *pastasana*

AGAVACEAE

Cordyline fruticosa (L.) A.Chev.

ALISMATACEAE

Alisma sp.
Sagittaria latifolia Willdenow

AMARANTHACEAE

Achyranthes aspera L.
Aerva sanguinolenta Blume
Alternanthera bettzichiana (Regel) Voss
Alternanthera brasiliensis (L.) Kuntze
Alternanthera lanceolata [*A. mexicana*]
Alternanthera mexicana (Schldl.) Hieron.
Alternanthera pubiflora (Benth.) Kuntze
Alternanthera spp.
Amaranthus caudatus L.
Amaranthus cruentus L.

Amaranthus hybridus L.
Amaranthus spp.
Celosia argenta L. var. *crispata*
Celosia crispata L. [*C. argenta*]
Cyathula achyranthoides (HBK) Moq. in DC.
Cyathula prostrata (L.) Blume
Cyathula sp.
Iresine diffusa Humb. & Bonpl. ex Willd.
Iresine sp.
Pfaffia irisinoides (H.B.K.) Sprengel
 genus indet.

AMARYLLIDACEAE
 [see LILIACEAE]

ANACARDIACEAE
Anacardium occidentale L.
Mangifera indica L.
Spondias mombin L.
Spondias purpurea L.
Tapira guianensis Aublet

ANNONACEAE
Anaxagorea spp.
Annona cherimola Miller
Annona duckei Diels
Annona muricata L.
Annona purpurea Mociño & Sesse ex Dunal
Annona spp.
Crematosperma sp.
Duguetia odorata (Diels) Macbr.
Duguetia sp.
Guatteria chrysophylla Maas & van Setten
Guatteria aff. *multivenia* Diels
Guatteria schunkeviogoi [*G. chrysophylla*]
Guatteria spp.
Porcelia sp.
Rollinia edulis Triana & Planchon
Rollinia mucosa (Jacq.) Baillon
Rollinia sp.
Unonopsis veneficiorum (Mart.) R.E.Fries
Unonopsis sp.
Xylophia aromatica
Xylophia neglecta (Kuntze) R.E. Fries
Xylophia spp.
 genus indet.

APIACEAE
Anethum graveolens L.
Arracacia xanthorrhiza Bancroft
Daucus carota L.
Eryngium foetidum L.

Spananthe paniculata Jacq.
genus indet.

APOCYNACEAE

Allamanda cathartica L.
Ambelania lopezii (Woodson) Schultes
Aspidosperma laxiflorum Kuhlmann
Aspidosperma rigidum Rusby
Aspidosperma verruculosum J. Mueller
Aspidosperma spp.
Bonafousia spp. [*Tabernaemontana* spp.]
Couma guianensis Aublet
Himatanthus articulata (Vahl.) Woodson
Himatanthus bracteatus (A.DC.) Woodson
Himatanthus lancifolius (Mueller) Woodson
Himatanthus sucuuba (Spruce) Woodson
Himatanthus spp.
Lacmella lactescens (Kuhlmann) Monachino
Lacmellea oblongata Markgraf
Lacmellea speciosa (L.) Woodson
Lacmellea spp.
Odontadenia cognata (Stadelm.) Woodson
Odontadenia funigera Woodson
Odontadenia sp.
Rauvolfia praecox K.Schumann ex Markgraf
Tabernaemontana maxima
Tabernaemontana sananho Ruiz & Pavon
Tabernaemontana tetrastachya H.B.K.
Tabernaemontana spp.
genus indet.

AQUIFOLIACEAE

Ilex guayusa Loes.

ARACEAE

Anthurium acrobates Sodiro
Anthurium alienatum Schott
Anthurium aureum Engl.
Anthurium clavigerum Poeppig & Endl.
Anthurium decurrens Poeppig
Anthurium eminens Schott
Anthurium ernestii Engl.
Anthurium gracile (Rudge) Lindley
Anthurium cf. *guayaguilense* Engl.
Anthurium harlingianum Croat.
Anthurium kunthii Poeppig
Anthurium lorentense Croat
Anthurium oxycarpum Poeppig
Anthurium polyschistum Schultes & Idrobo
Anthurium pseudoclavigerum Croat
Anthurium scandens (Aublet) Engl.
Anthurium tessmannii K.Krause

Anthurium triphyllum Brongniart
Anthurium cf. *uleanum* Engl.
Anthurium spp.
Caladium bicolor (Aiton) Vent.
Colocasia esculenta (L.) Schott
Diffenbachia seguine Schott
Dracontium lorentense Krause
Diffenbachia spp.
Dracontium sp.
Heteropsis oblongifolia Kunth
Heteropsis sp.
Homalonema spp.
Monstera adansonii Schott
Monstera dilacerata C.Koch
Monstera obliqua Miq.
Monstera spruceana (Schott) Engl.
Philodendron deflexum Poepp. ex Schott
Philodendron spp.
Rhodospatha cf. *montziana* (Schott) Croat
Spathiphyllum cf.
Stenospermation anomifolium (Poepp.) Schott
Syngonium podophyllum Schott
Syngonium yurimaguense Engl.
Xanthosoma helleborifolium (Jacq.) Schott
Xanthosoma violaceum Schott
Xanthosoma spp.
 genus indet.

ARALIACEAE

Dendropanax arboreus (L.) Dcne. & Planch.
Dendropanax umbellatus (R. & P.) Dcne. & Pl.
Dendropanax sp.
Didymopanax morototoni (Aublet) Dcne. & Pl.
Didymopanax sp.
Oreopanax sp.
Schefflera morototoni (Aubl) Mag, Stey & Fred
Schefflera sp.
 genus indet.

ARECACEAE

Aiphanes schultzeana Burret
Ammandra natalia H. Balslev & A. Henderson
Ammandra cf. *ulei*
Astrocaryum chambira Burret
Astrocaryum jauari Mart.
Astrocaryum murumuru Mart.
Astrocaryum cf. *tucuma* Mart.
Astrocaryum spp.
Attalea sp.
 cf. *Attalea* sp.
Bactris concinna Mart.
Bactris gasipaes H.B.K.

Bactris setosa
Bactris spp.
Catoblastus sp.
Chamaedora integrifolia Damm.
Chamaedora pinnatifrons (Jacq.) Oerst.
Cocos nucifera L.
Cryosophila warscewiczii (Endl.) Batl.
Denocarpus sp.
Desmoncus cf. *vacivus* L.H.Bailey
Desmoncus sp.
Dictyocaryum lamrkianum
Dictyocaryum superbum Burret
Euterpe precatoria Mart.
Euterpe sp.
Geonoma deversa (Poit.) Kunth.
Geonoma heinrichsiae Burret
Geonoma macrostachya Mart.
Geonoma maxima (Poit.) Kunth.
Geonoma pycnostachys Mart.
Geonoma tecurrens
Geonoma cf. *undata* Klotzsch
Geonoma spp.
Hyospathe elegans Martius
Iriartea deltoidea Ruiz & Pavon
Iriartea ventricosa
Iriartea spp.
Jessenia bataua (Mart.) Burret
Mauritia flexuosa L.f.
Mauritia sp.
Mauritiella cf. *aculeata* (Kunth) Burret
Maximiliana maripa (Aublet) Drude
Maximiliana sp.
Oenocarpus mapora Karsten
Oenocarpus minor
Oenocarpus sp.
Pholidostachys cf. *dactyloides* H.E. Moore
Pholidostachys syanthera (Martius) Moore
Phytelephas macrocarpa Ruiz & Pavón
Phytelephas microcarpa Ruiz & Pavón
Prestoea asplundii H.E. Moore
Prestoea spp.
Scheelea brachyclada Burret
Scheelea brassleriana
Scheelea rostrata
Socratea exorrhiza (Mart.) H.Wendl.
Socratea cf. *guinaria* [=W. maynensis]
Socratea spp.
Wettinia maynensis Spruce
Wettinia sp.
 genus indet.

ARISTOLOCHIACEAE

Aristolochia cornuta Mast.
Aristolochia spp.
 genus indet.

ASCLEPIADACEAE

Asclepias curassavica L.
Asclepias sp.
Matelea rivularis Woodson

ASTERACEAE

Acmella brachyglossa Cass.
Acmella ciliata (H.B.K.) Cassini
Adenostemma fosbergii K. & R.
Adenostemma platyphyllum Cass.
Ageratum sp.
Bidens bipinnata L. var. *cynapiifolia*
Bidens pilosa L.
Bidens sp.
Centratherum punctatum Cass.
Clibadium asperum (Aublet) DC. [see *C. surinamense*]
Clibadium cf. *grandifolium* Blake
Clibadium surinamense L.
Clibadium sylvestre (Aublet) Baillon
Clibadium spp.
Critonia spp.
Eclipta alba (L.) Hassk. [*E. prostrata*]
Eclipta prostrata (L.) L. [= *E. alba*]
Elephantopsis mollis HBK
Emelia sp.
Erechites hieracifolia (L.) Raf.
Eupatorium macrophyllum Linnaeus
Eupatorium microstemon Cassini
Eupatorium spp.
Hebeclinium macrophyllum (L.) DC.
Heliopsis buphthalmoides (Jacq.) Dunal
Jaegeria hirta (Lag.) Less.
Mikania micrantha H.B.K.
Mikania guaco H.B.K.
Mikania sp.
Neurolaena lobata (L.) R. Brown
 cf. *Piptocarpha* sp.
Pollalesta discolor (Kunth) Aristeguieta
Pollalesta karstesii (Sch. Bip.) Arist.
Polymnia sp.
Pseudelephantopus spiralis (Less.) Cronq.
Schistocarpha eupatoioides (Fenzl) Kuntze
Spilanthes alba L'Her.
Spilanthes cf. *americana*
Spilanthes cf. *paniculata* Jacq.
Spilanthes spp.
Tagetes erecta L.
Tagetes sp.

APPENDIX A - 42

Tessaria integrifolia Ruiz & Pavón
Vernonia arborescens (L.) Sw.
Vernonia baccharoides H.B.K. [*V. patens*]
Vernonia brachiata Benth. ex Oerst.
Vernonia patens Kunth
Vernonia spp.
Wulffia baccata (L.f.) Kuntze
Zinnia elegans Jacq.
 genus indet.

BALANOPHORACEAE

Ombrophytum sp.

BALSAMINACEAE

Impatiens balsaminea L.
Impatiens sultanii Hook.f.

BEGONIACEAE

Begonia fischeri Schrank
Begonia glabra Aublet
Begonia maynensis A.DC.
Begonia parviflora Poeppig & Endl.
Begonia rosseana A.DC. in Dc.
Begonia semiovata Liebm.
Begonia spp.

BIGNONIACEAE

Arrabidaea chica (Humb. & Bonpl.) Verlot
Arrabidaea sp.
Arrabidaea verrucosa (Standley) A.Gentry
Callichlamys latifolia (L.Rich.) K.Schum.
Crescentia cujete L.
Crescentia spp.
Distictella magnoliifolia (H.B.K.) Sandw.
Distictella racemosa (B. & Schum.exMart.)
Jacaranda copaia (Aublet) D.Don
Jacaranda copaia ssp. *spectabilis*
Jacaranda glabra (DC.) Burret & K.Schum.
Jacaranda sp.
Macfadyena uncata (Andrews) Sprag.&Sandw.
Macfadyena unguis-cati (L.) A.Gentry
Mansoa alliacea (Lam.) A.Gentry
Mansoa standleyi [*P. standleyi*]
Mansoa verrucifera (Schlect.) A.G.
Mansoa sp.
Martinella obovata (H.B.K.) Bur. & Schum
Memora cladotricha Sandw.
Pachyptera sp.
Pachyptera standleyi (Steyermark) A.Gentry *Spathicalyx*
xanthophylla (DC.) A.Gentry
Tabebuia chrysantha (Jacq.) Nichols.
Tabebuia chrysantha ssp. *pluvicola* A.Gentry

Tabebuia serratifolia (Vahl) Nicholson
Tabebuia sp.
Tynnanthus cf. *panurensis* (Bur.) Sandw.
Tynnanthus polyanthus (Bur.) Sandw.
 genus indet.

BIXACEAE

Bixa arborea Huber
Bixa orellana L.
Bixa platycarpa Ruiz & Pavon ex G. Don
Bixa urucuranana Willdenow
Bixa sp.

BOMBACACEAE

Bombacopsis quinta (Jacq.) Dugand
Ceiba cf. *insignis* Kunth
Ceiba pentandra (L.) Gaertner
Ceiba saumauma (Martius) K. Schum.
Ceiba spruceana Ducke
Ceiba sp.
Chorisia cf. *insignis* Kunth
Chorisia sp.
Matisia cf. *bracteolosa* Ducke
Matisia cordata Humboldt & Bonpland
Matisia malacocalyx (Rob. & Nil.) Alver.
Matisia obliquifolia Standley
Matisia ochrocalyx K. Schum.
Ochroma pyramidale (Cav.) Urban
Ochroma spp.
Pachira aquatica Aublet
Pachira insignis (Sw.) Sav.
Patinoa cf. *almirajo* Cuatrec.
Patinoa sp.
Pseudobombax septenatum (Jacq.) Dugand
Quararibea asterolepis Pittier
Quararibea bracteolosa [*M. bracteolosa*]
Quararibea cordata [*M. cordata*]
Quararibea grandifolia (Little) Cuatrec.
Quararibea malacocalyx [*M. malocalyx*]
Quararibea obliquifolia [*M. obliquifolia*]
Quararibea ochrocalyx [*M. ochrocalyx*]
Quararibea penningtonii Cheek
Quararibea wittii K. Schum & E. Ulbr.
Quararibea spp.
 genus indet.

BORAGIANCEAE

Borago officinalis L.
Cordia alliodora (Ruiz & Pavon) Oken
Cordia bifurcata Roemer & Schultes
Cordia nodosa Lam.
Cordia panamensis Riley

Cordia ripicola I.M.Johnston
Cordia spinescens L.
Cordia spp.
Heliotropium angiospermum Murr.
Heliotropium rufipilum (Benth) Johnston
Tournefortia angustiflora Ruiz & Pavon
Tournefortia glabra L.
Tournefortia aff. *hirsutum* Linnaeus
Tournefortia sp.
 genus indet.

BRASSICACEAE

Rorippa nasturtium-aquaticum(L)Brit.&Ren

DROMELIACEAE

Aechmaea cf *magdalena*(Andre)AndreexBaker
Aechmea zebrina L.B.Smith
Aechmea sp.
Ananas comosus (L.) Merrill
Catopsis sessiflora (R. & P.) Mez
Guzmania coriostachya (Grisebach) Mez
Guzmania eduardii Mez
Guzmania melinonis Regel
Guzmania monostachia (L.) Rusby ex Mez
Guzmania roezlii (E.Morr) Mez
Guzmania sp.
Pitcairnia aphelandriflora Lemaire
Streptocalyx longifolius (Rudge) Baker
Tillandsia bulbosa Hooker
Tillandsia fasciculata Swartz
Tillandsia complanata Benth.
Tillandsia cf. *multiflora* Benth.
Tillandsia cf. *pyramidata* Andre
Tillandsia spiculosa Grisebach var.
Tillandsia sp.

BRUNELLIACEAE

Brunellia comocladifolia H. & B. ssp. *comocladifolia*

BURSERACEAE

Crepidospermum rhoifolium (Benth.) Tr&Pl
Dacryodes cupularis Cuatrec. vel aff.
Dacryodes cf. *kukaskana* L.O.Williams
Dacryodes occidentalis Cuatrec.
Dacryodes peruviana (Loes.) Macbr.
Dacryodes sp.
Protium ecuadorensis Benoist
Protium gallosum Daly
Protium fimbriatum Swart
Protium cf. *macrocarpum* Cuatrec.
Protium macrophyllum (H.B.K.) Engl.
Protium nodulosum Swart

Protium tenuifolium (Engl.) Engl.
Protium spp.
Trattinnickia peruviana Loes.
Trattinickia rhoifolia Willd.
 genus indet.

CACTACEAE

Epiphyllum phyllanthus (L.) Haw.
Epiphyllum phyllanthus var. *phyllanthus*
Epiphyllum sp.
Hylocereus polyrhizus (Web.) Br.H.
Hylocereus sp.
Mediocactus megalanthus (Schum.) Britt & Rose
Rhipsalis baccifera (J.S. Mueller) Stearn

CAMPANULACEAE

Centropogon lorentensis Wimmer
Centropogon solanifolius Benth.
Hippobroma longifolia (L.) G. Don
 genus indet.

CANNACEAE

Canna indica L.
Canna jageriana Urban
Canna sp.
 genus indet.

CAPPARACEAE

Capparis magnifica Gilg ex Ule
Capparis sola Macbr.
 genus indet.

CAPRIFOLIACEAE

Sambucus cf. *mexicana* Presl.

CARICACEAE

Carica microcarpa Jacq. ssp. *microcarpa*
Carica monoica Desf.
Carica papaya L.
Carica sp.
Jacartia digitata (P. & E.) Solms-Laub.
Jacaratia spinosa (Aublet) A. DC.
 genus indet.

CARYOCARACEAE

Anthodiscus klugii
Anthodiscus peruvianus Baillon
Caryocar amygdaliforme G. Don
Caryocar glabrum (Aublet) Pers.
Caryocar sp.

CARYOPHYLLACEAE

Drymaria cordata (Linnaeus) Willd.

CECROPIACEAE

Cecropia cf. *ficifolia* Warb. ex Snethlage
Cecropia membranacea Trécul
Cecropia sciadophylla Martius
Cecropia spp.
Coussapoa asperifolia Trécul ssp.
Coussapoa cinnamomea
Coussapoa ovalifolia Trécul
Coussapoa orthoneura Standley
Coussapoa trinervia Spruce ex Mildbr.
Coussapoa spp.
Pourouma aspera Trécul
Pourouma bicolor Martius [=P. *guianensis*]
Pourouma cecropiifolia Martius ex Miq.
Pourouma cf. *chocoama*
Pourouma guianensis Aublet [P. *bicolor*]
Pourouma minor Benoist
Pourouma tomentosa Martius ex Miquel
Pourouma cf. *velutina*
Pourouma cf. *venezuelensis* Cuatrec.
Pourouma spp.
 genus indet.

CELASTRACEAE

Maytenus ebenifolia Reisseck
Maytenus krukovii A.C.Smith
Maytenus spp.
Salacia ulei Loess. [cf.]

CHENOPODIACEAE

Chenopodium ambrosioides L.

CHLORANTHACEAE

Hedyosmum glabratum H.B.K.
Hedyosmum racemosum
Hedyosmum sprucei
Hedyosmum strigosum

CHYRSOLBALANACEAE

Couepia chyrsoalyx (P. & E.) Benth. ex Hook f.
Hirtella bicornis Martius & Zuccarini var. *pubescens* Ducke
Hirtella macrophylla Benth. ex Hook f.
Hirtella pilosissima Martius & Zucc.
Hirtella racemosa Lam. var. *racemosa*
Hirtella triandra Swartz ssp. *triandra*
Hirtella sp.
Licania apetala (E. Meyer) Fritsch
Licania durifolia Cuatrec.

Licania hypoleuca Benth.
Licania sp.

CLUSIACEAE

Calophyllum brasiliense Cambess.
Chyrsochlamys bracteolata Cuatr.
Chyrsochlamys macrophylla Pax
Chyrsochlamys membranacea Planchon & Trel.
Chyrsochlamys weberbauerii Engl.
Chyrsochlamys spp.
Clusia amazonica Planchon & Triana
Clusia mamillota Cuatrec.
Clusia spp.
Dystovomita paniculata (Donn.Smith) Hammel
Dystovomita spp.
Hypericum cf. *mutilum* L.
Marila pluricostata cf Standl & Williams
Quapoya peruviana (Poeppig & Endl.) Kuntze
Rheedia acuminata (Ruiz & Pavon) Pl & Tr
Rheedia edulis
Rheedia macrophylla (Martius) Pl & Tr
Rheedia madruno Pl & Tr
Rheedia spruceana Engl.
Rheedia spp.
Symphonia globulifera L.f.
Tovomita weddelliana Pl & Tr
Tovomita spp.
Tovomitopsis membranacea (Pl & Tr) D'Arcy
Tovomitopsis spp.
Vismia baccifera sspdealbata (Kunth) Ewan
Vismia confertiflora Spruce ex Reichb.
Vismia macrophylla Kunth
Vismia cf. *tomentosa* Ruiz & Pavon
Vismia spp.
 genus indet.

Oedematopus sp.

COMBRETACEAE

Combretum laxum Jacq.
Combretum rotundifolium Rich.
Combretum sp.
Terminalia amazonica (J.F.Gmel.) Exell
Terminalia guianensis Eichl.
Terminalia oblonga (Ruiz & Pavon) Steudel
Terminalia sp.

COMMELINIACEAE

Callisia gracilis (Kunth) D.R. Hunt
Campelia zanonina (L.) H.B.K.
Commelina diffusa N.L. Burman
Commelina erecta L.
Commelina sp.
Dichorisandra sp.

APPENDIX A - 48

Floscopa peruviana Hassk. ex C.B.Clarke
Geogenanthus ciliatus Brueckn.
Geogenanthus rhizianthus (Ule) Brueckn.
Geogenanthus sp.
Tradescantia zebrina Bosse
Tripogandra serrulata (Vahl) Handlos

CONNARACEAE

Connarus fasciculatus (DC.) Planchon ssp. *pachyneurus*
Connarus sp.
Rourea cuspidata
Rourea sp.

CONVOLVULACEAE

Ipomoea batatas (L.) Lam.
Ipomoea carnea Jacq. ssp. *fistulosa*
Ipomoea fistulosa [*I. carnea* ssp. *fistulosa*]
Ipomoea spp.
Merremia macrocalyx (R. & P.) O'Donnell *Merremia* sp.

CORIARIACEAE

Coriaria ruscifolia L. ssp. *microphylla*

COSTACEAE

Costus asplundii (Maas) Maas
Costus erythrocoryne K. Schum.
Costus laevis Ruiz & Pavón
Costus pulverulents Presl.
Costus scaber Ruiz & Pavón
Costus spp.
Dimerocostus strobilaceus Kuntze
D. strobilaceus Kuntze ssp. *strobilaceus*
genus indet.

CRASSULACEAE

Bryophyllum spp. [*Kalanchoe*]
Kalanchoe pinnata (Lam.) Pers.

CUCURBITACEAE

Cayaponia glandulosa (P. & E.) Cogn.
Cayaponia ruizii Cogn.
Cayaponia sp.
Citrullus lanatus (Thunb.) Matsum. & Nakai
Cucurbita sp.
Cyclanthera pedata (L.) Schrader
Fevillea cordifolia L.f.
Gurania spinulosa (Poeppig & Endl.) Cogn.
Gurania sp.
Lagenaria siceraria (Molina) Standley
Luffa aegyptiaca Mill.
Luffa sp.
Melothria pendula L.

Momordica charantia L.
genus indet.

CYCLANTHACEAE

Asplundia alata Harling
Asplundia peruviana Harling [*A. alata*]
Asplundia spp.
Carludovica palmata Ruiz & Pavón
Carludovica sp.
Cyclanthus bipartitus Poit.
Evodianthus funifer (Poit.) Lindm.
Thoracocarpus bissectus (Vell.) Harling
genus indet.

CYPERACEAE

Cyperus articulatus L.
Cyperus diffusus Vahl
Cyperus laxus Lamarck
Cyperus odoratus Linnaeus
Cyperus prolixus H.B.K.
Cyperus surinamensis Rottboel
Cyperus spp.
Eleocharis elegans (Kunth) Roemer & Schultes
Eleocharis sp.
Fimbristylis dichotoma (L.) Vahl
Fimbristylis miliacea (L.) Vahl.
Fuirena sp.
Heliocharis sp. [*Eleocharis* sp.]
Rhynchospora blepharophora (Presl) Pfeiffer
Rhynchospora spp.
Scleria mitis Berg.
Scleria spp.
genus indet.

DICHAPETALACEAE

Tapura acreana
Tapura amazonica Poeppig & Endl. var.
Tapura guianensis Aublet
Tapura peruviana Krause
Tapura peruviana var. *petioliflora*
genus indet.

DILLENACEAE

Doliocarpus sp.
genus indet.

DIOSCORACEAE

Dioscorea cf. *polygonoides* H&B. ex Willd.
Dioscorea samydea K.von Mart. ex Griseb.
Dioscorea trifida L.f.
Dioscorea sp.

ELAEOCARPACEAE

Sloanea fragrans Rusby
 Sloanea grandiflora J.E.Smith
 Sloanea robusta Uittien
 Sloanea sp.
 genus indet.

ERICACEAE

Cavendishia sp.
 Macleania sp.
 Rammisia paucifolia
 Satyria panurensis (Benth.) Benth. & Hook.
 Spherospermum buxifolium Poepp. & Endl.
 Spherospermum sp. [cf.]
 Themistoclesia sp.

ERYTHROXYLACEAE

Erythroxylum coca Lam. var. coca
 Erythroxylum coca Lam. var. Ipadu Plowman
 Erythroxylum ulei O.E.Schulz
 Erythroxylum gracilipes Peyr.
 Erythroxylum macrophyllum Cav. var. mac
 Erythroxylum macrophyllum Cav. var. ecu
 Erythroxylum Ulei O.E. Schulz in Engl.
 Erythroxylum spp.

EUPHORBIACEAE

Acalypha cuneata Poeppig
 Acalypha diversifolia Jacq.
 Acalypha obovata Benth.
 Acalypha cf. odorata
 Acalypha spp.
 Alchornea castaneifolia
 Alchornea glandulosa Poeppig & Endl.
 Alchornea latifolia Swartz
 Alchornea triplinervia (Spreng) Mull.Arg.
 Alchornea sp.
 Aparisthium cordatum (Juss.) Baillon
 Caryodendron amazonicum Ducke
 Caryodendron orinocense Karsten
 Caryodendron sp.
 Chamaesyce hirta (L.) Millspaugh
 Chamaesyce hyssopifolia (L.) Small
 Croton lechleri J. Mueller
 Croton mutisianus
 Croton pungens Jacq.
 Croton spp.
 Dalechampia dioscoreifolia Poeppig
 Drypetes amazonica Stey.
 Euphorbia chamaesyce [E. prostrata]
 Euphorbia cotinifolia L.
 Euphorbia heterophylla L. cf.

Euphorbia laurifolia
Euphorbia prostrata Ait.
Euphorbia spp.
Hevea brasiliensis (Willd&Juss) Mueller
Hevea guianensis Aublet
Hura crepitans L.
Hyeronima alchorneoides Fr.Alemão
Hyeronima andina Pax & Hoffm.
Hyeronima chocoensis Cuatrec.
Hyeronima laxiflora (Tul.) J. Mueller
Hyeronima macrocarpa
Hyeronima oblonga (Tul.)J. Mueller
Hyeronima sp.
Jatropha curcas L.
Jatropha gossypifolia L.
Jatropha podagrica Hook
Mabea cf. *caudata* Pax & Hoffmann
Mabea maynensis
Mabea spp.
Manihot brachiloba J. Mueller
Manihot esculenta Crantz
Manihot sp.
Margaritaria noblis (L.f.) J. Mueller
Nealchornea sp.
Pausandra sp.
Pausandra sp.
Pausandra trianae (J. Mueller) Baillon
Phyllanthus acuminatus Vahl
Phyllanthus anisolobus J. Mueller
Phyllanthus cf. *brasiliensis*(Aublet)Poir.
Phyllanthus niruri Linnaeus
Phyllanthus piscatorum H.B.K.
Phyllanthus pseudoconami J. Mueller
Phyllanthus spp.
Piranhea trifoliata Baillon
Plukenetia volubilis L.
Richeria racemosa (P&E) Pax & Hoffm.
Ricinus communis L.
Sapium cuatrecasassii
Sapium eglandulosum Ule
Sapium marmieri Huber
Sapium utile Preuss.
Sapium vernum
Sapium stylare
Sapium sp.
Tetrochidium andinum J. Mueller
Tetrochidium macrophyllum J. Mueller
Tetrochidium rubrivenium Poeppig
Tetrochidium sp.
 genus indet.

FABACEAE - CAESALAPINIOIDEAE

Bauhinia arborea Wunderlin
Bauhinia tarapotensis Benth.
Bauhinia spp.
Brownea ariza Benth.
Brownea grandiceps Jacq.
Brownea macrophylla Linden ex Mast.
Brownea ucayalina (Huber) Ducke
Brownea spp.
Caesalpinia pulcherrima (L.) Sw.
Caesalpinia spp.
 Cassia [also Senna]
Cassia cowanii Ir. & Barn. var. Per
Cassia reticulata (Willd) Ir. & Barn.
Dialium guianense (Aublet) Sandw.ex Smith
Dussia cf. *tessmanii* Harms
Hymenaea courbaril L.
Hymenaea oblongifolia Huber var. *obla*
Hymenaea oblongifolia Huber var. *pal*
Hymenaea sp.
Macrolobium acaciifolium (Benth.) Benth.
Macrolobium ischnocalyx
Macrolobium cf. *stenocladum* Harms
Macrolobium unijugum (P&E) R.S.Cowan
Macrolobium spp.
Schizolobium amazonicum Huber ex Ducke
Schizolobium parahybum (Vell.) Blake
Schizolobium spp.
Sclerolobium guianense Benth.
Sclerolobium spp.
Senna alata (L.) Roxb.
Senna bacillaris (L.f.) Ir. & Barn.
Senna cernua (Balbis) Ir. & Barn.
Senna fruticosa (Mill.) Ir. & Barn.
Senna grandis L.
Senna hirsuta (L.) var. *hirta* Ir. & Barn.
Senna macrocarpa (Kunth) Ir. & Barn.
Senna macrophylla var. *giantifolia*
Senna multijuga var. *multijuga*
Senna reticulata (Willd.) Ir. & Barn.
Senna ruiziana (G.Don) Ir. & Barn.
Senna spinescens (Vog.) Ir. & Barn.
Senna trolliiflora Ir. & Barn.
Senna sp.
Tachigali sp.
 genus indet.

FABACEAE - MIMOSOIDEAE

Abarema jupurba (Willd.) Britt. & Killip
Acacia glomerosa Benth.
Acacia polyphylla Benth
Acacia multipinnata Ducke
Acacia spp.

Albizia sp.
Calliandra angustifolia Spruce ex Benth.
Calliandra carbonaria Benth.
Cedralinga catenaeformis Ducke
Entada polymorpha
Entada cf. *polyphylla* Benth.
Entada sp.
Entadopsis sp. [*Entada*]
Enterlobium barnebianum Mesq. & da Silva
Enterlobium cyclocarpum (Jacq.) Griseb.
Enterlobium spp.
Inga acrocephala Steudel
Inga cf. *brachybrachis* Harms
Inga cf. *ciliata* Presl.
Inga cordatolata Ducke
Inga edulis Martius
Inga densiflora Benth.
Inga fastuosa (Jacq.) Willd.
Inga grandiflora Ducke
Inga marginata Willd.
Inga mathewsiana Benth.
Inga pezizifera [spelling?]
Inga pruriens Poeppig & Endl.
Inga punctata Willd.
Inga quaternata Poeppig & Endl.
Inga ruiziana G. Don
Inga spectabilis (Vahl) Willd.
Inga thibaudiana DC.
Inga spp.
Mimosa myriadenia Benth. var. *punctatata*
Mimosa polydactyla H. & B. ex Willd.
Mimosa pudica L.
Mimosa rutescens Benth.
Mimosa spp.
Parkia auriculata
Parkia balslevii H.C. Hopkins
Parkia multijuga Benth.
Parkia nitida Miq.
Parkia velutina Benoist
Parkia spp.
Piptadenia flava (Spreng.) Benth.
Piptadenia psilostachys
Piptadenia pteroclada Benth.
Pithecellobium auriculatum Benth.
Pithecellobium laetum (P. & E.) Benth.
Pithecellobium latifolium (L.) Benth.
P. latifolium (L.) Benth. ssp. *latifolium*
Pithecellobium longifolium (H&B) Standley
Pithecellobium macrophyllum Spr ex Benth.
Pithecellobium pedicillare (DC.) Benth.
Pithecellobium spp.
Stryphnodendron porcatum Neill & Occhioni

Zygia longifolia (Willd.) Britt. & Rose
genus indet.

FABACEAE - PAPILIONOIDEAE

Aeschynomene americana L.
Arachis hypogaea L.
Cajanus bicolor DC.
Cajanus cajan (L.) Millsp. [*C. bicolor*]
Clitoria sp.
Crotalaria nitens HBK
Crotalaria sp.
Centrolobium paraense Tulasane
Dalbergia sp.
Desmodium axillare (Sw.) DC.
Desmodium spp.
Dioclea malacocarpa Ducke
Dioclea ucayalina Harms
Dioclea spp.
Diploctropis purpurea
Dussia cf. *discolor* Benth.
Dussia tessmanii Harms
Erythrina amazonica Krukoff
Erythrina krukovii
Erythrina peruviana Krukoff
Erythrina poeppigiana (Walp.) O.F.Cook
Erythrina rubrinervia H.B.K.
Erythrina ulei Harms
Erythrina spp.
Lonchocarpus araripensis Benth
Lonchocarpus nicou (Aubl.) DC.
Lonchocarpus nicou var. *languidus* (Aubl) DC
Lonchocarpus nicou var. *urucu* (Aubl) DC
Lonchocarpus spp.
Machaerium sp.
Monopteryx uacu Spruce ex Benth.
Mucuna mutisiana
Mucuna spp.
Myroxylon balsamum (L.) Harms
Myroxylon peristera
Myroxylon sp.
Ormosia amazonica Ducke
Ormosia cf. *oblongifolia*
Ormosia stipularis
Pachyrrhizus angulatus Rich ex DC.
Pachyrrhizus tuberosus (Lam.) Spreng.
Pachyrrhizus sp.
Phaseolus caracalla L. [*Vigna caracalla*]
Phaseolus vulgaris L.
Phaseolus sp.
Platymiscium pinnatum (Jacq.) Dugand
Platymiscium stipulare Benth.
Pterocarpus amaronum (Mart ex Benth) Amsh

Pterocarpus rohrii Vahl
Pterocarpus ulei Harms
Pterocarpus spp.
Pueraria phaseoloides (Thunberg) Benth.
Pueraria sp.
Rhynchosia sp.
Swartzia arborescens (Aublet) Pittier
Swartzia auriculatus Poeppig
Swartzia laevicarpa Amshoff
Swartzia schultessi Cowan
Swartzia simplex (Sw.) Sprengel
Swartzia simplex (Sw.) Sprengel var. *sim*
Swartzia spp.
Tephrosia toxicaria (Swartz) Persoon
Tephrosia sinapou (Buchoz) A.Chev.
Vigna caracalla (L.) Verdcourt

FLACOURTIACEAE

Banara guianensis Aublet
Carpotroche longifolia (Poeppig) Benth.
Carpotroche sp.
Casearia decandra Jacquin
Casearia fasciculata (R. & P.) Sleumer
Casearia javitensis H.B.K.
Casearia macrophylla Vahl [*C. pitumba*]
Casearia pitumba Sleumer [= *C. macrophylla*]
Casearia prunifolia H.B.K.
Casearia sylvestris Sw.
Casearia spp.
Laetia procera (Poeppig) Eichler
Lindackeria sp.
Lunania parviflora Spruce ex Benth.
Lunania sp.
Mayna amazonica (Mart. & Eichl.) MacBride
Mayna longifolia [*Carpotroche longifolia*]
Mayna odorata Aublet
Mayna sauveolens (Karsten & Triana) Wart.
Mayna sp.
Neosprucea grandiflora (Sprengel) Sleumer.
Neosprucea sp.
Ryania speciosa Vahl
Ryania sp.
Tetrathylacium macrophyllum P. & E.
Tetrathylacium sp.
Xylosma benthämii (Tul.) Tr. & Pl.
Xylosma sp.
 genus indet.

GENTIANACEAE

Voyria sp.

GESNERIACEAE

Besleria aggregata (Martius) Hanst.
Besleria sp.
Codanthe spp.
Codonanthopsis dissimulata (Moore) Wiehler
Columnnea archidonae Cuatrec.
Columnnea ericae Mansf.
Columnnea spp.
Dalbergaria picta (Karsten) Wiehler
Dalbergaria subracuta Wiehler
Dalbergaria tessmanii (Mansf.) Wiehler
Dalbergaria sp.
Drymonia coriacea (Oers. ex Hanst.) Wiehler
Drymonia pendula (Poeppig) Wiehler
Drymonia warszewicziana Hanst.
Drymonia sp.
Gloxinia perennis (L.) Fritsch
Kohleria spicata (H.B.K.) Oerst.
 genus indet.

HAEMODORACEAE

Xiphidium caeruleum Aublet

HELICONIACEAE

Heliconia chartacea Lane ex Barreiros
Heliconia hirsuta L.f.
Heliconia rostrata Ruiz & Pavón
Heliconia af. *stricta* Huber
Heliconia schumanniana Loesener
Heliconia subulata Ruiz & Pavón
Heliconia stricta Huber
Heliconia vellerigera Poeppig
Heliconia velutina L. Anderss.
Heliconia spp.

HERNANDIACEAE

Sparattanthelium amazonum Martius
Sparattanthelium glabrum Rusby

HIPPOCASTANACEAE

Billia colombiana Planchon & Lindley

HIPPOCRATEACEAE [or CELASTRACEAE?]

Salacia cf. *uleii* Loesener
Salacia sp.
 genus indet.

HUMIRIACEAE

Humiriastrum sp.

ICACINACEAE

Calatola columbiana Sleumer

Calatola costaricensis Standley
Calatola venezuelana Pittier
Citronella incarum (MacBride) Howard
Dendrobania boliviana Rusby
Leretic cordata Vell.
 genus indet.

IRIDACEAE

Eleuthrine bulbosa (Mill.) Urban
Sisyrinchium chilense

LACSIEMACEAE

Lacistema aggregatum (Berg.) Rusby
Lacistema nana Macbride
Lozania klugii (Mansf.) Mansf.
Lozania sp.

LAMIACEAE

Hyptis atrorubens Poit.
Hyptis capitata Jacq.
Hyptis mutabilis (A.Rich.) Briq.
Hyptis pectinata (L.) Poit.
Hyptis spp.
Melissa officinalis
Mentha suaveolens Ehrh.
Mentha verdis
Mentha sp.
Ocimum basilicum L.
Ocimum campechianum Willd.[=*O. micranthum*]
Ocimum micranthum Willd.[*O. campechianum*]
Origanum vulgare L.
Ocimum spp.
Salvia sp.
Satureja cf. *globosa*
Scutellaria cf. *agrestis* St.Hil. ex Benth
Stachys micheliana Brig.
 genus indet.

LAURACEAE

Aniba hostmanniana (Nees) Mez
Aniba cf. *puchury-minor* (Martius) Mez
Aniba sp.
Beilschmiedia sulcata (R. & P.) Kosterm.
Caryodaphnopsis sp. nov.
Caryodaphnopsis sp.
Cinnamomum zylanicum
Cinnamomum sp.
Endlicheria anomala Ness ex Meisner
Endlicheria krukovii (Smith) Kosterm.
Endlicheria pyriformis (Nees) Mez
Licaria canella (R. & P.) Kosterm.
Licaria limbosa (R. & P.) Kosterm.

Nectandra caucana (Meissner) Mez
Nectandra cf. *cinnamomoides* Nees.
Nectandra cf. *cissiflora* Nees
Nectandra coeloclada Rohwer ined.
Nectandra crassiloba Rohwer
Nectandra membranacea (Sw.) Griseb.
Nectandra obtusa
Nectandra reticulata (R. & P.) Mez
Nectandra turbacensis (H.B.K.) Nees
Nectandra spp.
Ocotea caudata (Nees) Mez
Ocotea costulata (Nees) Mez
Ocotea floribunda (Swartz) Benth
Ocotea javitensis (Kunth) Pittier
Ocotea laxiflora (Meissner) Mez
Ocotea longifolia Kunth
Ocotea quixos (Lamarck) van de Werff
Ocotea simulans C.K.Allen
Ocotea tessmannii O.C. Schmidt
Ocotea ucayalensis O.C. Schmidt
Ocotea venenosa Kosterm. & Pinkley
Ocotea spp.
Persea americana Mill.
Phoebe spp.
Rhodostemonodaphne kunthiana (Mez) Rohwer
genus indet.

LECYTHIDACEAE

Couratari sp.
Couroupita guianensis Aublet
Eschweilera andina (Rusby) Macbr.
Eschweilera coriacea (ADC) Mart. ex Berg
Eschweilera gigantea (R.Kunth) Macbr.
Eschweilera laevicarpa Mori
Eschweilera parvifolia Martius ex A.DC.
Eschweilera spp.
Grias foetidissima Dugand [*G. neuberthii*]
Grias neuberthii Macbr. [= *G. foetidissima*]
Grias peruviana Miers
Grias spp.
Gustavia longifolia Poeppig ex Berg
Gustavia hexapetala Aublet Smith
Gustavia macarenensis Philipson
Gustavia macarenensis Philipson ssp. mac
Gustavia spp.
genus indet.

LEMNACEAE

genus indet.

LILIACEAE

Allium cepa L.

Allium sp.
Bonarea sp.
Eucharis amazonica Lindley ex Planchon
Eucharis formosa Meerow
Eucharis grandiflora [U. *grandiflora*]
Hippeastrum puniceum (Lam.) Urban
Hippeastrum sp.
Urceolina grandiflora (Pl. & Lind.) Traub.
Urceolina sp.

LOASACEAE

Sclerothrix fasciculata Presl.

LOGANIACEAE

Potalia amara Aublet
Sanango racemosum (R. & P.) Barringer
Spigelia anthelmia L.
Strychnos amazonica Krukoff
Strychnos brachyata [spelling?] R. & P.
Strychnos darienensis Seemann
Strychnos erichsonii R. Schomb.
Strychnos guianensis (Aubl.) Mart.
Strychnos javariensis Krukoff
Strychnos jobertiana Baillon
Strychnos peckii B.L. Robinson
Strychnos cf. *peckii* B.L. Robinson
Strychnos subcordata Spruce ex Benth.
Strychnos tomentosa Benth.
Strychnos toxifera R. Schomb. ex Benth.
Strychnos spp.
 genus indet.

LORANTHACEAE

Aetanthus dichotomus (R. & P.) Kujit
Aetanthus nodosus [A. *dichotomus*]
Gaiadendron punctatum (R. & P.) G. Don
Oryctanthus alveolatus (H.B.K.) Kuijt
Oryctanthus florulentus (Rich.) van Tiegh
Oryctanthus spicatus (Jacq.) Eichler
Phoradendron piperoides (H.B.K.) Trel.
Phthirusa pyrifolia (H.B.K.) Eichler
Phthirusa sp.
Phrygilanthus eugenioides
Psittacanthus cucullaris (Lam.) Blume
Psittacanthus cupulifer [P. *cucullaris*]
Struthanthus leptostachyus (H.B.K.) G. Don
Struthanthus orbicularis (HBK) Blume
Struthanthus sp.
 genus indet.

LYTHRACEAE

Adenaria floribunda H.B.K.

Cuphea bobonazae Sprague
Cuphea racemosa (Lf.) Spreng. var *tropica*
Cuphea sp.

MAGNOLIACEAE

Talauma spp.

MALPIGHIACEAE

Banisteriopsis caapi (Spr ex Gris) Morton
Banisteriopsis cabrerana [D. cabrerana]
Banisteriopsis longialata (Nied.) Gates
Banisteriopsis muricata (Cav.) Cuatrec.
B. rusbyana [*B. longialata*]
Banisteriopsis spp.
Brunchosia argenta (Jacq.) DC.
Brunchosia hookeriana Juss.
Byrsonima japurensis Juss.
Byrsonima putumayensis Cuatrec.
Diploterys cabrerana (Cuatrec.) B.Gates
Hiraea sp. nov.
Stigmaphyllon sp.
genus indet.

MALVACEAE

Abelmoschus moschatus Medic.
Althaea officinalis L.
Gossypium barbadense L.
Gossypium hirsutum Linnaeus
Hibiscus abelmoschus L. [*A. moschatus*]
Hibiscus rosa-sinensis L.
cf. *Hibiscus* sp.
Malachra capitata
Malachra fasciata Jacq.
Malachra ruderalis Gürke
Malvaviscus penduliflorus DC.
Pavonia fruticosa (Miller) Faw. & Rend.
Pavonia leucantha Poeppig ex Garcke
Pavonia sp.
Sida acuta Burm.
Sida glomerata Cav.
Sida scandis
Sida poeppigiana (Schumann) Fyrr.
Sida sp.
genus indet.

MARANTACEAE

Calathea allouia (Aublet) Lindley
Calathea altissima (P. & E.) Koernicke
Calathea inocephala (Kuntze) Kenn. & Nic.
Calathea majestica (Linden) Kennedy
Calathea marantina (Willd ex Koern.) Koch
Calathea cf. *ornata* (Linden) Koernicke

Calathea plurispicata Kennedy
Calathea roseopicta (Linden) Regel
Calathea utilis Kennedy
Calathea spp.
Ischnosiphon cerotus Loes.
Ischnosiphon obliquus (Rudge) Koern.
Ischnosiphon puberulus Loes.
Ischnosiphon sp.
Maranta ruiziana Koernicke
Monotagma laxum (P. & E.) K.Schum.
Monotagma secundum (Peters) Schum.
Myrosma stromanthoides [= *stromanthoides*]
Monotagma cf. *vaginatum* Hagberg
Stromanthe stromanthoides (MacBride) And.
 genus indet.

MARCGRAVIACEAE

Marcgravia courarea
Marcgravia macrophylla
Marcgravia subcaudata
Marcgravia spp.
Marcgravia vel *Souroubea* sp.
Souroubea sp.
 genus indet.

MELASTOMATACEAE

Aciotis purpurascens (Aublet) Triana
Adelobotrys sp. (perhaps undescribed sp.)
Arthrostemma ciliatum Ruiz and Pavón
Bellucia axinantha Triana
Bellucia pentamera Naudin
Blakea cf. *ciliata* Markgrag
Blakea glandulosa Gleason
Blakea rosea (R. & P.) D.Don.
Blakea sawadae Mabride
Clidemia allardii Wurdack
Clidemia capitellata Bonpl. D.Don
Clidemia dentata D.Don
Clidemia dimorphica Macbride
Clidemia graciliflora Huber
Clidemia heterophylla (Desr.) Gleason
Clidemia hirta (L.) D.Don
Clidemia septuplinervia Cogn.
Clidemia sprucei Gleason
Clidemia sp.
Henriettella lawrancei Gleason
Henriettella sp.
Leandra caquetensis Gleason
Leandra sp.
Loreya collatata Wurdack [= *L. spruceanum*]
Loreya subandina Wurdack
Loreya spruceana [= *L. collatata*]

Loreya sp.
 Maieta guianensis Aublet
 Meriana ampla Wurdack
 Miconia affinis DC.
 Miconia amazonica Triana
 Miconia aspergillaris (Bonpl.) Naud.
 Miconia astroplocama Donn.Smith
 Miconia bubalina (D.Don) Naud.
 Miconia calvescens DC.
 Miconia cazaletii Wurdack
 Miconia decurrens Cogn.
 Miconia cf. dudleyi Wurdack
 Miconia elata (Sw.) DC.
 Miconia erioclada Triana
 Miconia hookeriana Triana
 Miconia grandifolia Ule
 Miconia lamprophylla Triana
 Miconia longifolia (Aublet) DC.
 Miconia lugonis Wurdack
 Miconia matthaei Naudin
 Miconia napoana Wurdack
 Miconia nervosa (Smith) Triana
 Miconia paleacea Cogn.
 Miconia pilgeriana Ule
 Miconia prasina (Swartz) de Candolle
 Miconia procumbens (Gleason) Wurdack
 Miconia punctata (Desr.) D.Don ex DC.
 Miconia serrulata (DC.) Naudin
 Miconia subspicata Wurdack
 Miconia trinervia (Sw.) D.Don ex Loud.
 Miconia venulosa Wurdack
 Miconia zubenetana MacBride
 Miconia sp.
 Monolena primulaeflora Hook.f.
 Mouriri sp.
 Ossaea capillaris (Don) Cogniaux
 Ossaea sp.
 Tessmannianthus heterostemon Markgraf
 Tibouchina longifolia (Vahl) Baillon
 Tibouchina ochypatela (R. & P.) Baill.
 Tibouchina sp.
 Tococa guianensis Aublet
 Tococa parviflora Spruce ex Triana
 Triolena hirsuta (Benth.) Triana
 Triolena pluvialis (Wurdack) Wurdack
 Triolena spp.
 genus indet.

MELIACEAE

Cabralea canjerana (Vell.) Martius
 C. canjerana (Vell.) Mart. ssp. canjerana
 Carapa sp.

Cedrela carinata Ducke
Cedrela fissilis Vell.
Cedrela montana
Cedrela odorata L.
Cedrela sp.
Guarea carinata Ducke
Guarea cinnamomea Harms
Guarea glabra Vahl
Guarea gomma Pulle
Guarea grandifolia A.DC.
Guarea guentheri Harms
Guarea guidonia (L.) Sleumer
Guarea kunthiana A.Juss.
Guarea macrophylla Vahl var. pen
Guarea macrophylla Vahl ssp. pac
Guarea pterorhachis Harms
Guarea pubescens (L.C.Rich.) A.Juss.
Guarea purusana C.DC.
Guarea silvatica C.DC.
Guarea spp.
Melia azederach L.
Ruagea insignis (CDC in JD Smith) Penn.
Swietenia macrophylla G.King
Trichilia maynasiana C.DC.
Trichilia pallida Sw.
Trichilia pleeana (A. Juss.) C.DC.
Trichilia quadrijuga Kunth ssp. quadrijuga
Trichilia rubra C.DC.
Trichilia septentrionalis C.DC.
Trichilia solitudinis Harms
Trichilia spp.
 genus indet.

MENDONCIACEAE

Mendoncia sp.

MENISPERMACEAE

Abuta grandifolia (Martius) Sandw.
Abuta rufescens Aublet
Abuta splendida Krukoff & Moldenke
Abuta spp.
Anomospermum chloranthum ssp. confusum
Ch. iquitatum [*Chondrodendron tecunarium*]
Chondrodendron tecunarium Barneby & Krukoff
Ch. tomentosum [*Curarea tomentosa*]
Ch. toxicoferum [*Curarea toxicofera*]
Chondrodendron spp.
Cissampelos grandifolia Triana & Planchon
Cissampelos pareira L.
Cissampelos sp.
Cocculus grandifolius [*Abuta grandifolia*]
Curarea tomentosa

Curarea toxifera Barneby & Krukoff
Curarea tecunarium [Ch. *tecunarium*]
Odontocarya spp.
Sciadotenia toxifera Krukoff & Smith
 genus indet.

MONIMIACEAE

Mollinedia spp.
Siparuna cervicornis Perk.
Siparuna eriocalyx (Tul.) A.DC.
Siparuna spp.
 genus indet.

MORACEAE

Artocarpus altilis (S. Parkinson) Fosberg
Artocarpus sp.
Bagassa guianensis Aublet
Batocarpus amazonicus
Batocarpus orinocensis Karsten
Brosimum alicastrum Sw. ssp. *bolivavense*
Brosimum lactescens (S. Moore) C.C.Berg
Brosimum utile (Kunth) Pittier
Brosimum sp.
Castilla ulei Warburg
Chlorophora tinctoria (L.) Guad.
Chlorophora tinctoria ssp. *tinctoria*
Clarisia biflora R. & P.
Clarisia racemosa R. & P.
Clarisia sp.
Ficus costaricana
Ficus cuatrecasana Dugand
Ficus erratica Standley
Ficus eximia Schott
Ficus glabrata H.B.K.
Ficus gomelleira Kunth & Bouche
Ficus guianensis Desv. ex Harms
Ficus insipida Willd.
Ficus insipida Willdenow ssp. *insipida*
Ficus macrasyce
Ficus martinii
Ficus cf. *mathewsii* (Miq.) Miq.
Ficus maxima P.Miller
Ficus pandifolia
Ficus paraensis (Miq.) Miq.
Ficus cf. *tonduzii* Standley
Ficus trianae Dugand
Ficus trigona Linnaeus f.
Ficus velutina
Ficus yoponensis Desv.
Ficus spp.
Heliocostylis tomentosa (P. & E.) MacBride
Heliocostylis scabra (MacBride) C.C. Berg

Helicostylis sp.
Maclura tinctoria (L) Steud ssp *tinctoria*
Maquira calophylla (P & E) C.C.Berg
Maquira sp.
Naucleopsis amara Ducke
Naucleopsis concinna (Standley) C.C.Berg
Naucleopsis krukovii (Standley) C.C.Berg
Naucleopsis sp.
Olmedia aspera R. & P.
Perebea guianensis Aublet
Perebea guianensis Aubl. ssp *castilloides*
Perebea tessmannii Mildbr.
Perebea xanthochyma Karsten
Perbea sp.
Poulsenia armata (Miq.) Standley
Pculsenia sp.
Pseudolmedia laevigata Trécul
Pseudolmedia laevis (R. & P.) Macbr.
Pseudolmedia macrophylla Trécul
Pseudolmedia rigida ssp. *rigida*
Pseudolmedia rigida (Klot & Karst) Cuatrec
Pseudolmedia sp.
Sorocea hirtella Mildbr.
Sorocea muriculata Miq. ssp. *muriculata*
Sorocea sarcocarpa
Trophis racemosa (L.) Urban
 genus indet.

MUSACEAE

Musa x paradisiaca L.
 genus indet.

MYRICACEAE (elevation?)

Myrica pubescens

MYRISTICACEAE

Componeura sprucei (A.DC.) Warb.
Componeura spp.
Dialyanthera sp. [*Otoba* sp.]
Iryanthera elliptica Ducke
Iryanthera juruensis Warb.
Iryanthera paraensis Huber
Iryanthera longiflora Ducke
Iryanthera macrophylla (Benth.) Warb.
Iryanthera paraensis Huber
Iryanthera ulei Warb.
Iryanthera sp.
Osteophloem platyspermum (A.DC.) Warb.
Otoba parvifolia (Markgraf) A.Gentry
Otoba sp.
Virola albidiflora Ducke

Virola calophylla Warb.
Virola carinata
Virola elongata (Spruce ex Benth.) Warb.
Virola flexuosa A.C.Smith
Virola multinervia Ducke
Virola peruviana (A.DC.) Warb.
Virola sebifera Aublet
Virola surinamensis (Rol.) Warb.
Virola spp.
 genus indet.

MYRSINACEAE

Ardisia guianensis (Aublet) Mez
Ardisia sp.
Cybianthus sp.
Stylogyne spp.
 genus indet.

MYRTACEAE

Calypttranthes cf. *longifolia* Berg.
Calypttranthes macrophylla Berg.
Calypttranthes maxima McVaugh
Calypttranthes plicata McVaugh
Calypttranthes sp.
Campomanesia lineatofilia R. & P.
Eugenia biflora (L.) DC.
Eugenia florida DC.
Eugenia jambos L.
Eugenia cf. *mirtomimeta* Diels
Eugenia stipitata McVaugh
Eugenia sp.
Myrcia fenestrata de Candolle
Myrcia sp.
Myrciaria floribunda (Willd.) Berg.
Myrciaria sp.
Psidium acutangulum DC.
Psidium guajava L.
Psidium sp.
 genus indet.

NYCTAGINACEAE

Mirabilis jalapa Linnaeus
Neea divaricata P. & E.
Neea floribunda P. & E.
Neea hirsuta (P. & E.) Schum.
Neea laxa P. & E.
Neea leterirens
Neea macrophylla P. & E.
Neea parviflora P. & E.
Neea virens Poeppig ex Heimerl
Neea spruceana Heimerl
Neea spp.

genus indet.

OCHNACEAE

Cespedesia macrophylla Seemann
 Cespedesia spathulata (R. & P.) Planchon
 Cespedezia sp.
 Ouratea cf. williamsii Macbr.
 Ouratea sp.
 Sauvagesia erecta L.

OLACACEAE

Heisteria acuminata (H. & B.) Engl.
 Heisteria cf. latifolia Standley
 Heisteria nitida Spruce ex Engl.
 Heisteria spruceana Engl.
 Heisteria sp.
 Minuartia guianensis Aublet
 genus indet.

ONAGRACAE

Ludwigia decurrens Walt.
 Ludwigia hyssopifolia (G. Don) Exell
 Ludwigia octovalis [L. decurrens]
 Ludwigia spp.

ORCHIDACEAE

Catasetum sp.
 Dichaea muricata (Sw.) Lindl.
 Elleanthus spp.
 Encyclia demula (Richb.) Dressler
 Epidendrum quadricornua
 Epidendrum rigidum Jacq.
 Epidendrum sp.
 Habenaria monorrhiza (Sw.) Richb.f.
 Habenaria sp.
 Lepanthes sp.
 Maxillaria conferta (Gris) Schwein ex Leon
 Masdevallia bicolor Poeppig & Endlicher
 Masdevallia diversifolia
 Maxillaria conferta (Griseb.) Leon Schw.
 Maxillaria rufescens Lindl.
 Oncidium pusillum (L.) Reichb.f.
 Oncidium sp.
 Phragmipedium sp.
 Pleurothallis canaligera Rchb. f.
 Pleurothallis cernua Luer
 Pleurothallis galeata Lindl.
 Pleurothallis nephroplossa Schltr.
 Pleurothallis ramificans Luer
 Pleurothallis scansor Luer
 Pleurothallis schizopogon Luer
 Pleurothallis simplicianlis

Pleurothallis sp.
Polystachya amazonica Schlechter
Polystachya concreta (Jacq.) Garay & Sweet
Schomburgkia crispa Lindl.
Selenipedium sp.
Stelis elongata H.B.K.
Stelis purpurea (R. & P.) Willd.
Stelis pusilla H.B.K.
Stelis scansor Rchb. f.
Stelis sp.
Vanilla sp.
 genus indet.

OXALIDACEAE

Biophytum sp.
Oxalis sp.

PASSIFLORACEAE

Passiflora alata Dryander
Passiflora edulis Sims
Passiflora foetida L.
Passiflora quadrangularis L.
Passiflora cf. *riparia* Mart. ex Mast.
Passiflora serratodigitata L.
Passiflora vespertilio L.
Passiflora vitifolia H.B.K.
Passiflora sp.
 genus indet.

PHYTOLACCACEAE

Petiveria alliacea L.
Phytolacca bogotensis
Phytolacca rivnoides Kunth & Bouche
Phytolacca spp.
 genus indet.

PIPERACEAE

Lepianthes sp. [*Piper*]
Peperomia glabella (Sw.) A. Dietr.
Peperomia josei Yunck
Peperomia quaesita Trel.
Peperomia sp.
Piper arboreum
Piper aduncum L.
Piper aequale Vahl
Piper albertsmithii Trel. & Yuncker
Piper amazonicum (Miq) CDC [*P. coruscans*]
Piper angustifolia Ruiz and Pavón
Piper aquadulcense Trel. & Yuncker
Piper angustifolia Ruiz and Pavón
Piper asterotrichum C.de Candolle

Piper asterotrichum C.de Candolle
Piper augustum Rudge
Piper bellidifolium Yuncker
Piper conojoense [P. leticianum]
Piper coruscans H.B.K [= P. amazonicum]
Piper crassinervium H.B.K.
Piper guianense (Klotzsch) C.DC.
Piper hispidum Sw.
Piper leticianum C.DC. [= P. conojoense]
Piper macerispicum Trel. & Yuncker
Piper marsupiatum Trel. & Yuncker
Piper maxonii C.DC.
Piper nudilimbium C.DC.
Piper obliquum R. & P.
Piper obtusilimbium C.DC.
Piper reticulatum L.
Piper scutilimbium C.DC.
Piper tuberculatum Jacq.
Piper umbriense Trel. & Yuncker
Piper sp.
Pothomorphe peltata (L.) Miq.
Pothomorphe umbellata (L.) Miq.
Pothomorphe sp.
 genus indet.

PLANTAGINACEAE

Plantago major L.

POACEAE

Arundo donax L.
Axonopus scoparius (Flugge) Hitchc.
Bambusa subgenus Padua
Bambusa vulgaris Schrad ex Wendl. var str
Bambusa sp.
Chusquea sp.
Coix lacyrma-jobi L.
Cymbopogon citratus (DC. ex Nees) Stapf.
Cymbopogon sp.
Eleusine indica (L.) Gaertn.
Guadua angustifolia Kunth
Gynerium sagittatum (Aublet) Beauv.
Lasiacis ligulata Hitchc. & Chase
Lasiacis sorghoidea (Desv.) Hitc.&Chase
Lasiacis scabrior A. Hitchcock
Olyra latifolia L.
Orthoclada laxa (L.Rich) Beauv.
Oryza sativa L.
Panicum pilosum Sw.
Panicum polygonatum Schrader
Pariana aurita Swallen
Pariana spp.
Paspalum conjugatum Berg.

Paspalum virgatum L.
Pharus latifolius L.
Pharus sp.
Saccharum officinarum L.
Setaria vulpiseta (Lam) Roemer & Schultes
Setaria sp.
Zea mays L.
 genus indet.

POLYGALACEAE

Monnina salicifloia [elevation?]
Polygala paniculata L.
Polygala sp.

POLYGONACEAE

Coccoloba densifrons Martius ex Meissner
Coccoloba latifolia Lehm.
Coccoloba mollis Casar.
Coccoloba sp.
Polygonum acuminatum
Rumex sp.
Triplaris americana L.
Triplaris cf. *cumingiana*
Triplaris dugandii Brandbyge
Triplaris inaequalis Dugand ex Brandbyge
Triplaris martii
Triplaris poeppigiana Wedd. [*T. dugandii*]
Triplaris schomburgkiana Benth.
Triplaris surinamensis Cham.
Triplaris sp.
 genus indet.

PONTEDERIACEAE

Heteranthera reniformis R. & P.
Pontederia diversifolia
Pontederia sp.
 genus indet.

PORTULACACEAE

Portulaca grandiflora Hook.
Portulaca oleracea L.
Portulaca pilosa L.
Portulaca sp.
 genus indet.

PROTEACEAE

Roupala sp.

QUIINACEAE

Quiina sp.

RANUNCULACEAE

Clematis sp.
Ranunculus sp.

RHAMNACEAE

Colubrina sp.
Gauania sp.
Zizyphus cinnamomum Triane & Planch.
 genus indet.

ROSACEAE

Hesperomeles glabrata [elevation?]
Margyricarpus cetosus R. & P.
Prunus vana Macbr.
Rubus sp.

RUBIACEAE

Alibertia edulis (L.C.Rich.) A.Rich
Alseis peruviana Standley
Borojoa sobilis (Ducke Cuatrec.
Borojoa sp.
Borreria laevis (Lam.) Griseb.
Borreria sp.
Calycophyllum acreanum Ducke
Calycophyllum obovatum Ducke
Calycophyllum spruceanum (Benth.) Hook.f
Calycophyllum sp.
Capirona decorticans Spruce
Cephaelis tomentosa (Aubl.) Vahl
Cephaelis williamsii Standley
Cephaelis sp.
Chimarrhis glabriflora Ducke
Chimarrhis hookeri Schum.
Chimarrhis sp.
Chomelia tenuiflora Benth.
Cilianthes sp.
Coccocypselum aureum (Spreng) Cham & Schl
Coffea arabica L.
Coffea canephora Pierre
Coussarea brevicaulis Krause
Coussarea dulcifolia Dwyer
Coussarea sp.
Duroia duckei Huber
Duroia hirsuta (P. & E.) K.Schum.
Duroia spp.
Elaeagia sp.
Faramea axillaris Standley
Faramea exemplaris Standley
Faramea miconioides Standl.
Faramea quinqueflora P. & E.
Faramea spp.
Ferdinandusa chlorantha (Wedd.) Standley
Genipa americana L.

Genipa curviflora Dwyer
Genipa spruceana Steyermark
Geophila cordifolia Miq.
Geophila herbacea (Jacq.) K.Schum.
Geophila repens (L.) I.M. Johnston
Geophila spruceana
Geophila sp.
Gonzalagunia cornifolia (H.B.K.) Standley
Hamelia axilliaris Sw.
Hamelia patens Jacq.
Hoffmannia sp.
Isertia sp.
Landbergia sp.
Manettia divaricata Wernham
Manettia glandulosa P. & E.
Pallasia standleyana Klotzsch
Palicourea spp.
Pentagonia macrophylla Benth.
Pentagonia parvifolia Steyermark
Pentagonia spathicalyx K.Schum.
Pentagonia sprucei Standley
Pentagonia williamsii Standley
Pentagonia spp.
Posoqueria latifolia (Rudge) Roem. & Sch.
Posoqueria sp.
Psychotria brachiata Swartz
Psychotria carthaginensis Jacq.
Psychotria flaviflora (Krause) Standley
Psychotria franquevilleana J. Mueller
Psychotria micrantha H.B.K.
Psychotria cf. *polyphlebia*
Psychotria racemosa (Aubl.) Rausch.
Psychotria remota Benth.
Psychotria stenostachya Standley
Psychotria viridis R. & P.
Psychotria sp.
Remijia asperula Standley
Rudgea cf. *amazonica* Muell.
Rudgea spp.
Sickingia [*Simira*]
Simira cordifolia (Hook.f.) Steyermark
Simira rubescens (Benth.) Bremek. ex Stey
Simira sp.
Tocoyena sp.
Uncaria spp.
Warscewiczia coccinea (Vahl) Klotzsch
Warscewiczia schwackei Schum.
Warscewiczia sp.
Wittmackanthus standleyanus Kuntze
genus indet.

RUTACEAE

Amyris macrocarpa R.Gereau (n. sp. nov. ined)
Citrus aurantifolia (Christm.) Swingle
Citrus aurantium L.
Citrus limon (L.) Burm.f.
Citrus x paradisi Macfad.
Citrus reticulata Blanco
Citrus sinensis (L.) Osbeck
Citrus sp.
Zanthoxylum caribaeum Lam.
Zanthoxylum culantrillo Kunth
Zanthoxylum grandifolium Tul.
Zanthoxylum cf. *juniperinum* P. & E.
Zanthoxylum procerum Donn.Smith
Zanthoxylum vel. aff. *riedelianum* Engl.
Zanthoxylum tachuelo Little
Zanthoxylum spp.

SABIACEAE

Melisoma herbertii Rolfe
Melisoma sp.
Ophiocaryon heterophyllum (Benth.) Urban
Ophiocaryon sp.
Sabicea villosa Willd. ex R. & S.

SAPINDACEAE

Allophyllus floribundus (P. & E.) Radlk.
Allophyllus pilosus (MacBride) A.Gentry
Allophyllus peruvianus Radlk.
Allophyllus pilosus (MacBride) A.Gentry
Allophyllus punctatus (P. & E.) Radlk.
Allophyllus scrobiculatus (R. & P.) Radlk
Allophyllus sp.
Cardiospermum grandiflorum Swartz
Cardiospermum halicacabum L.
Cardiospermum sp.
Cupania americana
Cupania cinera P. & E.
Cupania sp.
Paullinia alata (R. & P.) G.Don
P. alata (R&P) G.Don ssp. *loretana* Macbr.
Paullinia bracteosa Radlk.
Paullinia serjanifolia Triana & Planchon
Paullinia yoco Schultes & Killip
Paullinia sp.
Serjania inflata P. & E.
Serjania rubicaulis Bentham ex Radlkofer
Serjania sp.
Talisia cf. *acutifolia* Radlk.
Talisia sp.
 genus indet.

SAPOTACEAE

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Chrysophyllum argenteum Jacquin ssp. aur
Chrysophyllum argenteum Jacquin ssp. fer
Chrysophyllum amazonicum Pennington
Chrysophyllum aureum cf.
Chrysophyllum caimito Griseb. ex Pierre
Chrysophyllum manaosense (Aubr.) Penn.
Chrysophyllum peruvianum sp. nov. Penn.
Chrysophyllum sanguinolentum (Pierr) Boeh
Chrysophyllum venezuelanense (Pierre) Penn.
Chrysophyllum spp.
Manilkara bidentata (A.DC.) Chev.
Micropholis egensis (A.DC.) Pierre
Micropholis melinoniana Pierre
Micropholis venulosa (Mart. & Eichl) Pierre
Micropholis sp.
Pouteria caimito (R. & P.) Radlk.
Pouteria cuspidata ssp. robusta
Pouteria durlandii (Standley) Baehni
Pouteria dolichophylla Pennington
Pouteria aff. *glauca* Pennington
Pouteria glomerata (Miq.) Radlk.
Pouteria cf. *guianensis* Aublet
Pouteria hispida Eyma
Pouteria multiflora (A.DC.) Eyma
Pouteria reticulata (Engl.) Eyma ssp. ret
Pouteria sclerocarpa (Pittier) Cronquist
Pouteria torta (Martius) Radlk. ssp. tub
Pouteria sp.
 genus indet.

SCROPHULARIACEAE

Alonsoa meridionalis (L.f.) Kuntz
Bacopa stricta (Schrader) Edwall
Lindernia crustacea (Linnaeus) F. Mueller
Scoparia dulcis L.
 genus indet.

SIMAROUBACEAE

Picramnia martiniana Macbr.
Picramnia sellowii Planch ex Hook ssp. spr
Picramnia spruceana Engl. *P. sellowii*
Picramnia sp.
Simarouba amara Aublet
 genus indet.

SMILACACEAE

Smilax spp.

SOLANACEAE

Acnistus arborescens (L.) Schlect.
Browallia americana L.
Brugmansia arborea (L.) Lagerheim

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Brugmansia x insignis (Barb.Rodr.) Lockw.
Brugsmania sanguinea (R. & P.) D.Don
Brugsmania suaveolens (H&B ex Willd) B&Pr
Brugmansia sp.
Brunfelsia chiricaspi Plowman
Brunfelsia grandiflora ssp *grandiflora*
Brunfelsia grandiflora ssp. *schultesii*
Brunfelsia grandiflora D.Don
Brunfelsia sp.
Capsicum annuum L.
Capsicum chinense Jacq.
Capsicum sp.
Cestrum racemosum R. & P.
Cestrum reflexum Sendtner
Cestrum silvaticum Francey
Cestrum spp.
Cyphomandra cf. *allophylla*
Cyphomandra crassicaulis (Ortega) Kuntze
Cyphomandra endopogon Bitter
Cyphomandra endopogon var *parviflora*
Cyphomandra hartwegii (Miers) Walpers
C. hartwegii (Miers) Walp. var *hartwegii*
Cyphomandra sp.
Datura insignis [B.x *insignis*]
Datura stramonium L.
Deprea peruviana Zahlbruckner
 cf. *Hebecladus* sp.
Jaltomata procumbens (Cav.) J.L. Gentry
Juanulloa ochracea Cuatrec.
Lycianthes cf. *amatitlanensis*
Lycianthes cf. *cyathocalyx*
Lycianthes sp.
Lycopersicon esculentum Mill.
Lycopersicum sp.
Markea sp.
Markea vel Juanullos sp.
Nicotiana tabacum L.
Nicotiana sp.
Physalis angulata L.
Physalis cf. *gracilis*
Physalis peruviana L.
Physalis pubescens L.
Physalis pubescens L. var. *pubescens*
Physalis spp.
Solanum americanum Mill.
Solanum appressum Roe
Solanum candidum Lindl.
Solanum cyathophorum M.Nee [in edit.]
Solanum diffusum R. & P.
Solanum georgicum R.E.Schultes
Solanum hirsutissimum Standley
Solanum cf. *hypermegethes* Werdelin

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Solanum leptopodum Van Heurck & Mueller
Solanum lycopersicum L.
Solanum mammosum L.
Solanum morellifolium Bohr.
Solanum pectinatum Dunal
Solanum quitoenses Lam.
Solanum sessile R. & P.
Solanum sessiliflorum Dunal
Solanum schlechtendalianum Walpers
Solanum stramaniifolium (Jacq.) var. *ine*
Solanum supranitidum Bitter
Solanum tequilense A.Gray [*S. candidum*]
Solanum tuberosum L.
Solanum cf. *urticans* Dunal
Solanum vanheurckii J. Mueller
Solanum sp.
Witheringia solanacea L'Her.
Witheringia sp.
 genus indet.

STAPHYLEACEAE

Huerteia glandulosa R. & P.
Huerteia putumayensis Cuatrec.

STERCULIACEAE

Guazuma crinata Martius
Guazuma sp.
Herrania balaensis Preuss
Herrania cuatrecasana Garcia Barriga
Herrania dugandii Garcia Barriga
Herrania mariae (Martius) Dec.ex Goudot
Herrania nitida (P. & E.) Schultes
Herrania sp.
Sterculia apetala (Jacq.) Karsten
Sterculia colombiana Sprague
Sterculia diequensis [spelling]
Sterculia excelsa Martius
Sterculia pilosa Ducke
Sterculia pruriens (Aublet) Schum.
Sterculia rugosa Rob.Brown
Sterculia tessmannii Mildbraed
Sterculia spp.
Theobroma bicolor Humb. & Bonpl.
Theobroma cacao L.
Theobroma speciosum Willd. ex Sprengel
Theobroma subincanum Mart.
Theobroma subincana Martius
 genus indet.

STYRACACEAE

Styrax sp.
Styrax tessmannii Perkins

SYMPLOCACEAE

Symplocus sp.

THEOPHRASTACEAE

Clavija hookeri A.DC. [*C. weberbauerii*]

Clavija membranacea Mez

Clavija procera Stahl (sp. nov. ined.)

Clavija aff. *tarapotana* Mez

Clavija venosa Stahl

Clavija weberbaueri Mez [= *C. hookeri*]

Clavija sp.

genus indet.

THYMELAEACEAE

Schoenobilus peruvianus Standley

TILIACEAE

Apeiba aspera Aublet ssp. *membranacea*

Apeiba membranacea [*A. aspera*]

Apeiba schomburgkii

Apeiba tibourbou Aublet

Apeiba sp.

Heliocarpus americanus spp. *popayanensis*

Mollia williamsii

Mollia sp.

genus indet.

ULMACEAE

Celtis iguana Jacq. Sargent

Celtis schippii Standley

Celtis sp.

Trema integerrima (Beurl.) Standley

Trema micrantha (L.) Blume

Trema sp.

genus indet.

URTICACEAE

Bohmeria caudata Sw.

Pilea hydrocotyliflora Killip

Pilea imparifolia Wedd.

Pilea sp.

Urera baccifera (L.) Gaudich

Urera caracasana (Jacq.) Griseb.

Urera elata

Urera laciniata (Goudot) Wedd.

Urera sp.

genus indet.

VERBENACEAE

Aegiphila alba Moldenke

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Aegiphila haughtii Moldenke
Aegiphila integrifolia (Jacq.) B.D.Jacks.
Aegiphila sellowiana Cham.
Aegiphila sp.
Citharexylum poeppigii Walp.
Clerodendron sp.
Lantana armata Schauer
Lantana camara L.
Lantana sp.
Lippia sp.
Petraea maynensis Huber
Petraea peruviana Moldenke
Priva sp.
Stachytarpheta cayennensis (Rich) Vahl
Stachytarpheta sp.
Verbena litoralis H.B.K.
Verbena sp.
Vitex cymosa Bert. ex Sprengel
Vitex orinocensis var. *multiflora*
Vitex schunkei Moldenke
Vitex sp.
 genus indet.

VIOLACEAE

Gloeospermum sphaerocarpum Tri. & Pla.
Leonia crassa Sm. & Fernandez
Leonia glycyarpa R. & P.
Leonia sp.
Rinorea apiculata Hekking
Rinorea lindeniana (Tul.) Kuntze
Rinorea racemosa (Mart.) Kuntze
Rinorea viridiflora Rusby
Rinoreocarpus ulei (Melchior) Ducke
 genus indet.

VISCACEAE

Dendrophthora Lueri Kuijt
Phoradendron crassifolium (DC.) Eichler
Phoradendron sp.

VITACEAE

Cissus bifoumifolia [sic]
Cissus ulmifolia (Baker) Planchon
Cissus erosa L.C.Rich.
Cissus sicyiodes L.
Cissus ulmifolia (Baker) Planchon
Cissus sp.
 genus indet.

VOCHYSIACEAE

Erisma uncinatum Warm.
Qualea sp.

Ruizterania sp.
Vochysia bracelinii Standley
Vochysia ferruginea Martius
Vochysia gardneri Warm.
Vochysia grandis Martius
Vochysia guianensis Aublet
Vochysia sp.
genus indet.

XYRIDACEAE

Xyris sp.

ZINGIBERACEAE

Curcuma longa L.
Hedychium coronarium Koenig
Renealmia alpina (Rottb.) Maas
Renealmia asplundii Maas
Renealmia breviscapa P. & E.
Renealmia nicolaioides Loes.
Renealmia spp.
Renealmia thyrsoidea (R. & P.) P. & E.
R. thyrsoidea (R&P) P&E ssp. thyrsoidea
Zingiber officinale Roscoe
genus indet.

PTERIDOPHYTA

ADIANTACEAE

Adiantum sp.
 Antrophyum brasilianum
 Antrophyum cajenense
 Pityrogramma calomelanos (L.) Link
 Pityrogramma sp.
 Polytaenium guayanense (Hieron.) Alston

ASPIDIACEAE

Tectaria sp. [cf]

ASPLENIACEAE

Asplenium serratum
 Asplenium sp.
 Diplazium cf. ambiguum Raddi
 Diplazium juvenile
 Elaphoglossum cf. apodum (Klf.) Schott
 Lomariopsis japurensis (Martius) J. Smith
 Lomariopsis sp.
 Polybotra decorata
 Polybotra salicifolia L. Jlinger [sic]

BLECHNACEAE

Blechnum occidentale
 Blechnum volubile ?
 Blechnum sp.

CYATHACEAE

Cyathea sp.
 Sphaeropteris sp.
 Trichipteris nigripes (C. Chr.) Barr.
 genus indet.

DAVALLIACEAE

Nephrolepis sp.

DENNSTAEDTIACEAE

Lindsaea sp.

DRYOPTERIDACEAE

Bulbitis lindigii
 Cyclopeltis semicordata

GLEICHENIACEAE

Dicranopteris cf. pectinata (Willd) Presl

HYMENOPHYLLACEAE

Hymenophyllum sp.
 Trichomanes membranaceum L.

POLYPODIACEAE

Campyloneuron sp.

Pleopeltis percussa (Chr.) Hook & Grev.

Polypodium angustifolium

Polypodium decumanum

Polypodium percussum Cav.

Polypodium sp.

genus indet.

SCHIZACEAE

Lygodium venustum

THELYPTERIDACEAE

Thelypteris cf. *berroi* (C.Chr.) Reed

Thelypteris sp.

CONFIFEROPHYTA

PODOCARPACEAE

Podocarpus montanus [elevation]

Podocarpus oleifolius

Podocarpus rospigliosii Pilger

LYCOPHYTA

SELLAGINELLACEAE

Selaginella exaltata (Kze.) Spring

Selaginella mortoniana Crabbe & Jermy

Selaginella speciosa

Selaginella sp.

SPHENOPHYTA

EQUISETACEAE

Equisetum giganteum L.

FUNGI

AURICULARIACEAE

Auricularia cf fuscosuccinea (Mont.)Farl

POLYPORACEAE

Ganoderma sp.

TRICHOLOMATACEAE

Marasmius schultesii Singer

Psylocybe sp.

LICHENS

DICTYONEMATACEAE

Dictyonema sp.

USNEACEAE

Usnea sp.