History of Botanical Exploration in Territorio Federal Amazonas, Venezuela

Otto Huber
and John J. Wurdack
ABSTRACT

Huber, Otto, and John J. Wurdack. History of Botanical Exploration in Territorio Federal Amazonas, Venezuela. Smithsonian Contributions to Botany, number 56, 83 pages, 2 tables, 10 maps, 1984.—Detailed information is provided on botanical activities in the Territorio Federal Amazonas, southern Venezuela, during the period 1800 to 31 December 1982. Emphasis is on botanical collections, their collectors, localities, itineraries, time period, number, and final deposit in the world’s herbaria. The data are arranged both chronologically and alphabetically by collectors, including cross references between main and secondary collectors. Altogether 188 collectors are listed, 124 of them being main collectors. The total collected plant numbers in T. F. Amazonas is now about 50,000 (not including duplicates), representing an estimated 3000 to 5000 species. A short geographical outline at the beginning of the paper, accompanied by a map, provides general information on main localities, rivers, mountains, and other features often mentioned in the text and on the labels of herbarium specimens.
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Introduction

Among the many natural regions of South America, the southernmost portion of Venezuela, including the headwaters of the Orinoco River and part of the Amazon Basin, has long attracted the interest of botanists and naturalists in general. Such historic expeditions as those undertaken to these regions by Humboldt and Bonpland in 1800 and by Schomburgk in 1839 may well be considered as among the first highlights in tropical American botany. These trips were forerunners of an increasing number of explorations in the astonishing vegetation types covering Territorio Federal Amazonas. Because of the increasing attention given in the past two decades to the Amazon region in general, mainly by governmental developmental agencies in Brazil, Venezuela, Colombia, Ecuador, and Peru, it also has become evident that the basic ecologic information on the plant life and plant geography of this extremely rich portion of the American tropics is still poorly known and still more poorly understood (Goodland and Irwin, 1975).

This paper offers a synopsis of botanical exploration carried out from 1800 to the present (1982) in the Venezuelan Territorio Federal Amazonas, with general information on the collectors, collecting expeditions, and collecting stations, as well as on the number and final deposition of the specimens collected and related publications. We are well aware that this paper is incomplete, because this type of research is often accompanied by insufficient data. Nevertheless, we believe that the data submitted are sufficiently accurate to serve as a basis to stimulate future investigation in this direction, not only in the field but also in herbaria and libraries.

The acronyms for Venezuelan government agencies used in the text and lists are explained in the “Annotated List of Collectors.” These acronyms (those asterisked are directly involved in a collection program) include *AsoVAC (Asociación Venezolana para el Avance de la Ciencia), *CASUB (Centro de Actividades Subacuáticas de la Universidad de Oriente, Cumaná), *CODESUR (Comisión para el Desarrollo del Sur de Venezuela), CONICIT (Consejo Nacional de Investigaciones Científicas y Tecnológicas), *INPARQUES (Instituto Nacional de Parques), *IVIC (Instituto Venezolano de Investigaciones Científicas), MAB (Man and Biosphere

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The maps were drawn by Tomás Rodríguez, Caracas, Venezuela, and their inclusion in this study is made possible by the gracious permission of the Dirección General de Información e Investigación del Ambiente, Ministerio del Ambiente y de los Recursos Naturales Renovables, República de Venezuela.

GEOGRAPHY

The Territorio Federal Amazonas occupies the southernmost portion of the Republic of Venezuela. It is located between 0°40′N−6°15′N and 63°20′W−67°50′W; the area is 178,095 km² (CODESUR, 1979). It is subdivided into four administrative departments: Departamento Atures (capital, Puerto Ayacucho); Departamento Atabapo (capital, San Fernando de Atabapo); Departamento Casiquiare (capital, Maroa), and Departamento Río Negro (capital, San Carlos de Río Negro). Since 1924 Puerto Ayacucho has been the capital of the Territorio. It currently has approximately 20,000 inhabitants and is the seat of the Governor and other public regional institutions. Other major towns and settlements are San Fernando de Atabapo, San Carlos de Río Negro, Maroa, San Juan de Manapiare, Yavita, Santa Bárbara, San Antonio, Esmeralda, Victorino, Santa Rosa de Amandona, Guarinuma, Macuruco, and Cacurí (see Map 1, at back of book).

The Territorio Federal Amazonas is limited on the north by the Distrito Cedeño of the adjoining Venezuelan Estado Bolívar; on the east by the Territorio Federal Roraima of Brazil; on the south by the Estado do Amazonas, Brazil; and on the west by the Comisarías Vichada and Vaupés of Colombia. These boundaries are formed in most cases by natural watersheds at the tops of mountains and mountain ranges (in the northern, eastern, and southern frontiers); the western boundaries are formed by the courses of the Ríos Orinoco, Atabapo, Guainia, and Negro. In only two cases has the frontier been delimited artificially: in the southwestern portion (Venezuelan-Brazilian frontier) by a line drawn between Piedra de Cocuy on the Río Negro and the Salto Huá on Caño Maturacá at the western base of Sierra Neblina, and in the Guainía-Atabapo region (Venezuelan-Colombian frontier), where an artificial boundary line is drawn approximately from the confluence of the three rivers Atacavi, Temi, and Guasacavi to the west of the village of Victorino on the Río Guainía.

Physiography

The Territorio Federal Amazonas has two main physiographical regions, the vast peninsular of the Casiquiare in the central and southwestern section and the huge mountain systems embracing the Territorio to the north, east, and south. Between these generally level lowlands and the different mountain systems, several piedmont
landscapes of variable width and altitude are developed; in these, the frequent, isolated granite hills ("inselbergs," "lajas") form the most outstanding features. Because of the complicated geological and geomorphological history of the Territorio, which is not yet clearly understood, this region at the southwestern border of the Guayana Shield offers an overwhelming variety of different landscapes and other topographic features within a relatively small area.

**MOUNTAIN SYSTEMS.**—From north to south and from west to east the following main mountain systems can be distinguished (see Map 1).

**Cerros Guanay, Santo, Camani, Morrocoy, Coro-coro, Yuta-jé, Yavi, and Ualipano.**

This mountain chain extends along the northern-central boundary between T. F. Amazonas and Estado Bolivar. The general height of these mountains ranges between 840 m (Cerro Morrocoy west of San Juan de Manapiare) and nearly 2300 m (Cerro Yavi in the upper Parucito Valley), whereas the remaining mountains have altitudes of 1500–1800 m. All of them except Cerro Ualipano (which is also called Cerro Calentura and is of granitic origin) are typical table mountains ("tepuis") with more or less flat surfaces formed by sandstone belonging to the Roraima Formation; they arise abruptly from the surrounding piedmont and lowland region with vertical cliffs up to 400 m high. (Further literature in Hitchcock, 1947, 1948; Lasser and Maguire, 1950; Maguire and Phelps, 1951; Mayr and Phelps, 1967).

**Cerros Autana, Cuao, Sipapo (Paraque).**

Located to the southeast of Puerto Ayacucho, this mountain system is one of the largest in T. F. Amazonas. Its highest elevations reach approximately 2000 m (no definite altitude measurements available) and most of the surface is flat to slightly inclined towards the east, showing typical tepui landscape with a dissected plateau. The upper rock strata consist of Roraima Formation. The spectacular Cerro Autana, at the western end of the range, is an isolated tower with an altitude of approximately 1300 m and a surface of about 0.3 km²; it is, therefore, the westernmost Venezuelan tepui and at the same time the smallest in area. Cerro Autana was declared a natural monument in 1978. (Additional literature: Mayr and Phelps, 1967; Colvée, 1973; Steyermark, 1974, 1975; Brewer-Carías, 1976).

**Cerro Parú (A’roko) and Asisa.**

This range is located in the headwaters of the Rio Ventuari to the southwest of Cacuri (a recent Ye’kuana (Makiritare) settlement on the upper Ventuari). It reaches approximately 2000 m at its highest southwestern point, but the main level is between 1100 and 1600 m. The strongly dissected internal plateaus are more or less flat and formed by sandstone of the Roraima Formation, as are the outer cliffs. The southwestern portion is called Cerro Asisa, but it forms part of the entire massif of Parú. (Additional information: Mayr and Phelps, 1967; Hoyos, 1973).

**Cerro Yapacana.**

This elongated sandstone table mountain of approximately 1250 m elevation is located about 40 km southeast of the Orinoco-Ventuari confluence. It is entirely covered by forest, except on some cliffs at the northern and the southern faces. It is the only isolated mountain arising from the Casiquiare peniplain. Due to the extraordinary biological value of the flora and fauna found on this mountain and in the surrounding lowlands, the Venezuelan government in 1978 decreed this area as the "Parque Nacional Yapacana." (Further information: Mayr and Phelps, 1967).

**Cerros Duida, Marahuaca and Huachamacari.**

This famous and spectacular mountain system is one of the largest in T. F. Amazonas and reaches its highest elevation of approximately 2850 m in Cerro Marahuaca. Cerro Huachamacari reaches about 1700 m, and Cerro Duida 2400 m on its southern ridge. These mountains are located in the central part of the Territorio, just to the northwest of Esmeralda on the upper Orinoco, and to the east and north of the Rio Cunucunuma. All three mountains, isolated from one another by steep valleys, are typical tepuis of the Roraima Sandstone Formation. Duida is by far the largest one, covering approximately 400 km²; the other two mountain systems are much smaller in extent. Cerros Duida and Marahuaca together form the "Parque Nacional Duida-Marahuaca," established in December 1978. (Further literature: Humboldt, 1818–1829; Schomburgk, 1840a,b; Tate and Hitchcock, 1930; Schomburgk, 1931; Mayr and Phelps, 1967; Medina, 1969).

**Sierra Parima.**

The Parima range extending from north to south forms the eastern boundary of T. F. Amazonas with Brazil. It shows the geomorphological features of an “altiplano” ranging generally between 900 and 1200 m in altitude, and has a slightly dissected, rather undulating relief with smooth to conical peaks up to 1500 m. Apparently, only a few isolated remnants of the Roraima Formation are found within the Parima range, which consists mainly of granitic rock formations of the igneous basement of the Guayana Shield (RADAMBRASIL, 1975). (Additional information: Schomburgk, 1840a,b; Koch-Grünberg, 1917; Rice, 1928, 1937; Holdridge, 1933; Smole, 1976).

**Sierras Unturán and Tapirapeco.**

No data are available on this large mountainous area south of the uppermost headwaters of the Rio Orinoco and bordering the Rio Matapire to the north (Sierra Unturán) and to the south (Sierra Tapirapeco). The average height
of these mountains may well reach or exceed 1000 m. So far, no sandstone formations have been recorded for this region.

Sierra de la Neblina, Cerro Avispa, Cerro Aracamuni, Sierra Imeri.

These are the southernmost mountains of Venezuela, forming an enormous complex of plateaus, valleys, slopes and cliffs, all now in the recently declared “Parque Nacional Neblina” (December 1978). Pico Phelps, just 600 m south of the Venezuelan border on Sierra Neblina, is the highest elevation of Brazil, 3045 m. Most of the massif ranges between 1200 m (Cerro Aracamuni to the north) and 2100–2500 m (Cerro de la Neblina to the south). Cerros Aracamuni and Avispa unmistakably bear the character of flat-topped tepuis. Cerro de la Neblina shows a much more irregular topography on its summit, which consists mainly of quartztic sediments. (Further literature: Maguire, 1955; Maguire and Wurdack, 1959, 1960; Ort, 1965; Mayr and Phelps, 1967).

LOWLANDS.—The lowland region of T. F. Amazonas has elevations ranging from 60 m near the confluence of the Ríos Orinoco and Meta at the northwestern edge to approximately 500 m in the uppermost headwater region of the Ríos Orinoco and Ventuari. Most of the extensive Casiquiare peneplain lies at an altitude ranging between 100 and 200 m. At least five distinct physiographic lowland plains can be identified within the Territorio, proceeding from north to south and from west to east as listed.

Piedmont region.

This region includes the Orinoco to the east between San Fernando de Atabapo and its confluence with the Río Meta; it extends eastward from the right-hand side of the river to the base of the Serranías Cuao and Sipapo. The northern section of this area consists of gently rolling landscape with many isolated granitic outcrops up to 400 m high. The vegetation is predominantly forest, interrupted by more or less extensive savannas. The southern section is nearly flat and densely covered by tall forests, except the southermost portion, where wide open savannas begin to predominate.

Manapiare basin plains.

These extensive alluvial plains cover most of the basin drained by the Ríos Manapiare and Parucito and are completely flat. The northern part is covered by inundated savannas and forests, whereas the southern half is covered densely by tall forests.

Ventuari plains.

This region extends from the confluence of the Río Ventuari with the Orinoco on the west to the headwaters region of the Río Ventuari on the east. The area is drained by the Ventuari and its left-hand tributaries Yureba, Murueta, Parú and Asisa and by the right-hand tributaries Caños Corocoro and Picure (or Guapuchi) in its lower section. These plains are covered by a mosaic of partly inundated savannas and forests.

Casiquiare Peneplain.

This is the largest lowland area of T. F. Amazonas, covering more than a third of its entire surface (approximately 60,000 km²). It is delimited as follows: to the north by the Río Orinoco from San Fernando de Atabapo to its junction with the Río Ventuari and by the lower section of the Ventuari itself; to the east by the mountain systems of Serranía del Tigre (south of Carmelitas or Yacurai on the lower Ventuari) and of Huachamacari-Duida up to Esmeralda, then by the Ríos Orinoco and Mavaca; to the south by the Serranía del Unturáin and Cerro Aracamuni; and to the west, by the Ríos Atabapo, Guainia and Negro (in Venezuela; but the Casiquiare peneplain extends further westward into Colombia). This extensive area is drained by four river systems: the Río Orinoco and all its eastern tributaries between Esmeralda and Santa Bárbara (Ríos Cunucunuma, Guanami, Puruname, and Yagua); the Río Atabapo and its eastern tributaries (Caño Caname, Río Atacavi, Río Temi); the Río Guainia between Victorino and its confluence with the Río Casiquiare and its left-hand tributaries (Caño Pimichin, Caño San Miguel or Cononorchtie, and Caño Tirinquin); and, finally, the Caño or Brazo or Canal Casiquiare itself together with its southwestern tributaries (Río Pamoní, Río Pasiba, Ríos Manipitare and Siapa, and Río Pacimoni). The Casiquiare peneplain has only a few emergent hills, such as the Serranía Cariche west of the bifurcation on the left bank of the Río Orinoco, less than 300 m high. In the region south of the Casiquiare, isolated granitic outcrops are common. The best known are Piedras Culumacare and Guanari, on the left bank of the lower Casiquiare, and Laja Catipán on the lower Yatúa, a tributary of the Río Pacimoni. The vegetative cover of the Casiquiare peneplain is formed predominantly by lowland rain forests in the central and eastern sections, by a mosaic of savannas, scrub, and low to medium forests in the northern section, and by “caatinga” forests in the southwestern section.

Upper Orinoco piedmont plains.

This heavily forested lowland, between 200 and 500 m above sea level, extends between the eastern bank of the upper Orinoco from Esmeralda to its confluence with the Río Manaviche, and the western base of the Sierra Parima, continuing southward east of the Río Mavaca until it reaches the northern base of Sierra de Unturáin. The main rivers draining the area are the Orinoco and its right-hand tributaries Río Ocamo, Río Padamo (formed by the Ríos Cuntinamo, Botamo o Utamo, and Matacuni) and Caño Iguaqu (Humboldt’s “Guapo”); from the south the only important tributary is the Río Mavaca.
Additional information on the geographical features of the lowland regions of T. F. Amazonas are given in the classical accounts of Humboldt (1818–1829), Schomburgk (1840a,b), Wallace (1853), Michelenay Rojas (1867), Chaffanjon (1889), Spruce (1908), Rice (1921), Tate and Hitchcock (1930), Schomburgk (1931), Hitchcock (1947, 1948).

This brief geographical outline of the Territorio Federal Amazonas provides a general account of the names of the main rivers, mountains, towns and villages referred to widely by the collectors cited in the next sections. For additional detailed information the following may also be consulted: Tavera-Acosta (1906, 1913–1914), Jahn (1909a,b), Friel (1924), Roncayolo (1934), Ramos Perez (1946), Gomez Picón (1953), Maguire (1979), and the (partly unpublished) reports of CODESUR produced between 1970–1979. Of these the most significant is the one that resulted from the radar inventory of Territorio Federal Amazonas and the accompanying set of maps (Aeroservice, 1972).

Until 15 to 20 years ago, the most important maps of the region were the sheets NA-19, NA-20, NB-19, and NB-20 of the American Geographical Society’s map of Hispanic America, scale 1:1,000,000. During the years 1971–1972, the already mentioned radar inventory, carried out by Aeroservice on behalf of CODESUR, covered cartographically the entire Territorio Federal Amazonas and adjacent Distrito Cedeno of Estado Bolivar. As a result, a base map, scale 1:1,000,000, was produced by the Cartografia Nacional of Venezuela in 1975. Today this is considered the official map of that region. It should be emphasized here that, since 1975, all modern expeditions to Territorio Federal Amazonas, especially those trips made by helicopter, have used this base map and its toponymy for the identification of their collecting sites and areas visited.

This same radar inventory also has provided a set of 19 maps on the scale of 1:250,000 for each of the following themes: “Geology and Geomorphology,” “Soils,” “Hydrography,” and “Vegetation.” These maps have not been published but may be consulted at the offices of Cartografia Nacional of the Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) in Caracas. Another recent cartographic publication on T. F. Amazonas is the Atlas de la Region Sur by CODESUR (1973; 1979, second edition). Finally, many kinds of expeditions to regions south of the Orinoco are widely employing LANDSAT- and ERTS-satellite imagery.

**Transportation**

By far the most important means of transportation is still fluvial navigation by small- to medium-sized boats. “Curiara” and “bongo” are small boats (dugouts) made from a single tree trunk by hollowing out and opening the trunk with fire. This is a technique of long tradition in T. F. Amazonas among the Makiritare Indians (which are by far the most river-bound tribe). A large-sized curiara or bongo can be up to 12–15 m long, carry one to two tons of cargo and is often provided with a palm roof or, more recently, a tin roof. “Falcas” and “piraguas” (the latter term is no longer used) are boats of larger size made of wooden planks and provided generally with a small room at the rear of the boat. These are the largest boats, irregularly navigating for commercial and trading purposes the upper Orinoco above the rapids of Maypures at Samariapo and the Rio Negro. Navigation on the Rios Casiquiare, Atabapo, Guainia and Manaipiare, as well as on the upper part of the Rio Ventuari is determined by the strong fluctuations of the river levels between the rainy seasons (March to December) and the relatively dry season (during the rest of the year).

Next of importance today is the airplane. The capital of Puerto Ayacucho can be reached daily in 50 minutes by jet from Caracas. Most major settlements within the Territorio are served by a regular monomotor airline network. During the first period of activity of CODESUR (1970–1973), many small landing strips were con-
Three roads outside of towns now exist in the Territorio. One, recently paved and about 160 km, runs from Puerto Nuevo (El Burro in front of the confluence of the Orinoco and Meta) to Puerto Ayacucho and to Sanariapo (or Samaríapo). In the near future, this road will connect the Territorio with the adjoining Distrito Cedeno of Estado Bolivar and with Caicara on the Orinoco. Another road, unpaved, goes from Yavita to Pimichin to Maroa, approximately 38 km. The first part (Yavita to Pimichin) was used by Humboldt in 1800; the second part (Pimichin to Maroa), as well as the airfield of Maroa, was constructed by CODESUR in 1972–1973. The third road extends from San Carlos de Rio Negro to Solano, connecting the Río Negro with the Casiquiare. It has a length of approximately 20 km and was built by CODESUR in 1973.

**Chronology of Botanical Exploration**

**GENERAL**

In this section, a chronological resumé of the main phases of botanical exploration in Territorio Federal Amazonas is given. In Table 1, however, a complete chronological record of all botanical collectors, together with the areas visited by them in T. F. Amazonas between 1800 and 1982 (inclusive), also may be consulted for major details.

Although there is no doubt that the first actual herbarium specimens from T. F. Amazonas were gathered by Humboldt and Bonpland in 1800, there must have been some earlier specimens of wild cocoa collected by missionaries or other travelers around 1730–1740 in the upper Orinoco region (Rios Padamo and Ocamo). As a matter of fact, in 1754 an official botanist, Pehr Loefling, a student of Linnaeus, was sent on the Solano expedition specifically to gather authentic specimens of cocoa and other useful plants, such as the Pará- or Brazil-nut, in the upper Orinoco region. Previous samples of cocoa that were brought to the attention of Linnaeus had been identified as *Theobroma cacao* L. and were reputed to be of better quality than the races from the Brazilian Amazon (Ramos Pérez, 1946). The premature death of Loefling on the lower Orinoco delayed botanical exploration of the Territorio Federal Amazonas by some 40 years. Although Solano’s expedition hired several persons as substitutes for Loefling, they do not seem to have collected botanical specimens, for no herbarium material resulting from their activities is known to have reached Europe.

As has already been mentioned above, the expedition of Alexander von Humboldt and Aimé Bonpland to the upper Orinoco region in April to June 1800 must be considered the first real botanical exploration in this area. Despite the extremely difficult conditions so vividly described by Humboldt, 500 to 1000 collections were made, mainly by Bonpland, and an impressive number of them were new to science. The route followed by Humboldt and Bonpland took them only through the lowlands of the Territorio. Most of their collections were made in riverine forests or in forests and open places around the main settlements of Atures, Maypures, San Fernando de Atabapo, Yavita, San Carlos de Río Negro, and Esmeralda.

Thirty-nine years later, between January and March 1839, the next botanical exploration was carried out, this time by a geographer entering the Territorio from the opposite side of that of Humboldt and Bonpland. Robert Hermann Schomburgk traveled from the northern Parima mountains to Esmeralda, partly by walking and partly by navigating the Rios Cuntinamo and Padamo. From Esmeralda he continued his exploration down the Rios Orinoco, Casiquiare and Negro into Brazil, thence back to Guyana via the Río Branco.

Next, from April 1853 to November 1854, Richard Spruce made his historical plant-collecting expeditions over wide areas of the Territorio, becoming also the first botanist to visit the Río Cunucunuma and the Ríos Pacimoni and Yatúa. His extensive collections, together with those of
Humboldt and Bonpland, provided the basic flora of the region for more than 80 years. Somewhat earlier, from February to March 1852, his colleague, the famous naturalist Alfred Russel Wallace, spent two months in intensive observations (collecting plants and insects) at Yavita; unfortunately almost all his collections were lost during the return to Europe.

During the 19th Century a number of explorers tried to reach the sources of the Río Orinoco, the most important being Arnaud (1835–1837), Codazzi (1838), and Michelen y Rojas (1855–1876), but only the expedition of Chaffanjon in 1886 obtained plant collections. Chaffanjon was followed, a year later, by another French botanist, Gaillard, who made extensive cryptogamic (and some phanerogamic) collections from the regions around Atures (Puerto Ayacucho) and San Fernando de Atabapo. In the same year, the first Venezuelan naturalist and botanist, Alfredo Jahn, together with Vincent Marcano, visited the Territorio Federal Amazonas and made a small collection of plants later described by Ernst (1888).

After more than 30 years of botanical inactivity in T. F. Amazonas, Hamilton Rice made an expedition in 1920 to the Ríos Negro, Casiquiare, and upper Orinoco. This was the first time a motor-powered launch was used in this region. Although no collections were made during Rice’s expedition, interest in the region was again stimulated. A few years later, in 1928, G.H.H. Tate, leading an American Museum of Natural History expedition to Cerro Duida (“Tyler-Duida Expedition”), was the first to explore the fauna and flora of a tepui in T. F. Amazonas, obtaining many species and genera new to science. During 1929 to 1931 the ornithologist Ernest Holt collected plants twice along the Ríos Orinoco, Casiquiare, and Negro. In 1931, he made the first ascent to the summit of Cerro Yapacana, collecting only birds there.

In the late thirties another legendary explorer, Capitán Félix Cardona, made his first expedition in Amazonas. He was a member of the Venezuelan-Brazilian Frontier Commission, which was the first to visit (1945–1946) the southernmost mountains in the headwaters of the Río Siapa or Matapire, as the upper course of this river is now called.

During August to September 1944, Julian Steyermark made his first trip to T. F. Amazonas, making the second ascent to the summit of Cerro Duida. This outstanding botanist collected a large number of previously unknown plant taxa.

An extensive ornithological exploring program to most of the principal tepuis of Estado Bolívar and T. F. Amazonas was undertaken by W.H. Phelps, Jr., and his colleagues between 1938 and 1955. This was followed starting in 1948 in T. F. Amazonas by an equally intensive program of expeditions led by Bassett Maguire of The New York Botanical Garden. Maguire and his colleagues, Cowan and Wurdack, carried out the most complete plant collecting survey ever made in Amazonas. Their collection total in Amazonas exceeded 10,000 numbers, with many new species, genera and even families represented.

Another famous exploration was the “Expedición Franco-Venezolana a las Fuentes del Orinoco” (French-Venezuelan expedition to the sources of the Orinoco), which started in July 1951 from Esmeralda and in November reached for the first time the sources of that magnificent river. From this expedition the well-known botanist and biogeographer, León Croizat, brought back more than 1000 numbers of plants from a region hitherto unvisited by any botanist.

Other botanical expeditions in the fifties and early sixties were made by Vareschi and the bryologist K. Mägdefrau (1958) in commemoration of the centennial of Humboldt’s death (“Humboldt-Gedächtnis-Expedition 1958”); by Foldats to the Río Atacavi, a tributary of the Río Atabapo (1960); and by Breteler to the region of Isla Ratón and the lower Río Sipapo (1965).

The epoch of modern expeditions by means of airplane and helicopter support was preceded, in the early sixties, by a number of aerial reconnaissance flights made by such famous jungle pilots as Harry Gibson. Among other important
observations, Gibson discovered the caves of Cerro Autana on 8 March 1950 and the spectacular sinkholes on top of Cerro Sarisariñama in Estado Bolivar on 25 November 1961. The first truly botanical expedition by airplane to T. F. Amazonas was made in July 1967 by Vareschi and his friend and expert pilot, Dr. E. Herbig. They landed a small airplane in a natural savanna of the remote Parima region at Simarawochi (headwaters of Rio Matacuni). During their visit, they carried out botanical and ecological studies of the surrounding area.

In March of the same year, Phelps and collaborators completed the first expedition by helicopter to a tepui in the Guayana Highlands, to the Jaua-Sarisariñama massif in Estado Bolivar. Thus was inaugurated an entirely new style of exploration, which soon was to become adopted in most later Venezuelan expeditions. The first helicopter expedition in T. F. Amazonas took place in January 1969 during the AsoVAC-Expediton to Cerro Duida and the upper Orinoco region; it was based at Esmeralda and was conducted by E. Medina and his botanical colleagues M. Farinas and J. Velásquez.

The “Geographical Magazine Amazonas Expedition by Hovercraft” during April and May 1968 was another memorable expedition: T. F. Amazonas was crossed from south to north, coming from Manaus enroute to the island of Trinidad. Among the scientific personnel were the British geographers, M. Eden, D.R. Harris, and J.B. Thornes, and the Venezuelan ecologist E. Medina.

The decade beginning in 1970 has been characterized by an impressive increase of botanical research in Venezuelan Amazonas. The recent creation of a governmental development agency for the Territorio Federal Amazonas (CODESUR) focused much attention between 1970 and 1974 on the natural resources of this region and the possibilities of their exploitation. CODESUR was the Venezuelan counterpart to the Brazilian program, which in the late sixties implemented a development plan for its Amazonian highway system. During 1971 and 1972, an extensive radar inventory of the natural resources of the Territorio gave, for the first time, precise basic information on the river systems, physiography, geology, geomorphology, soils, vegetation, and landscapes of the upper Orinoco basin. Also in the course of the CODESUR program, spectacular expeditions were carried out. These include the trip to Cerro Autana in September 1971 by Brewer-Cárias and Steyermark and the first exploration of the summit of Cerro Marahuaca during January and February 1975 by Tillett and his companions. As a result of these expeditions, a wealth of new information was gathered on the botany of this western section of the Guayana Highlands.

During 1974, one of the most important research projects on tropical forests was started at San Carlos de Río Negro. It was organized by an international and multidisciplinary team of scientists (mainly ecologists) under the direction of E. Medina and R. Herrera (both from IVIC, Venezuela), H. Klinge (Max-Planck-Institut, Federal Republic of Germany), and C. Jordan (University of Georgia, U.S.A.), under the auspices of UNESCO's “Man and Biosphere” research program. The presence of a resident botanist, H. Clark, at San Carlos de Río Negro for several years together with the repeated visits of R. Liesner (Missouri Botanical Garden, St. Louis) has augmented significantly the knowledge of the flora of the region. It is now very likely the best explored area in T. F. Amazonas.

In 1977, the former CODESUR development agency was transferred into the newly created Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR; Ministry of Environment and Natural Renewable Resources); from then on, the exploration activities, both botanical and zoological, in Territorio Federal Amazonas have been widely advanced by well-equipped base camps at San Juan de Manapiare, Santa Bárbara, Tamatama, and San Carlos de Río Negro, along with efficient airplane and helicopter support. During 1977 to 1981, an intensive botanical-ecological inventory of the savannas and other herbaceous formations in the lowlands of the Territorio was carried out by O. Huber, accompanied by a faunistic (mainly her-
petological) inventory (by J. Cerda) and by a geomorphological-pedological study of the savanna landscape (by A. Zinck). Since 1980, the regional office of MARNR at Puerto Ayacucho has promoted the establishment of a regional herbarium. Its founder and first curator, F. Guánchez, is the botanical resident of MARNR in T. F. Amazonas. He has already made several expeditions to remote places in the Territorio.

During the last two years the botanical exploration of the highest parts of the Duida-Mara-huaca massif has been the highlight of the most recent phase of exploration in the Guayana High-land: first by Maguire and Steyermark (January 1981), then by Steyermark and Liesner (February 1981), and finally by Steyermark, Luteyn, Mori, Holmgren, and Guariglia (January to February 1982). A large number of collections from the summit of Mara-huaca, including numerous species and three new genera, have resulted from these three expeditions conducted by Brewer-Carias and aided by helicopter transport.

Before concluding this outline, mention also should be made of the numerous plant collections and other contributions made by non-botanists, mainly anthropologists, during their research on the different Indian tribes of the Territorio. Probably the first anthropologist visiting T. F. Amazonas was Theodor Koch-Grunberg, who entered the Territorio in 1913 at the headwaters of the Rio Ventuari, homeland of the Makiritare Indians. Although he did not make plant collections, his descriptions of the region are an extremely valuable and useful source of information for any naturalist (Koch-Grunberg, 1917, 1979). Modern anthropological research has increasingly focused on the role of plants in the life of the Indians of these regions. Several studies have been made on ethnobotany in the upper Orinoco and Ventuari region, the most important being those by Lizot, Colchester and Lister, Colchester, Fuentes, and Alès and Chiappino.

**Geographical and Chronological Synopsis**

For the purpose of more direct reference, this section cites all the explorations that have taken place in the Territorio Federal Amazonas during the last two centuries, arranged chronologically. For each expedition, the main geographical areas where plant collections were made are given. Accordingly, the Territorio Federal Amazonas has been subdivided into 18 areas, of which the first ten (1–10) refer to lowlands and the following eight (11–18) refer to uplands (mainly tepuis).

Map 2 shows the delimitation of the 18 geographical areas in the Territorio. Although an attempt has been made to adhere as far as possible to the natural regions of the Territorio, it must be kept in mind that in some cases the areas delimited are rather artificial. For reference convenience, places that have been visited frequently have been united into one area, but without precise indication of the collecting locality. This is particularly true for the riverine vegetation; therefore, the Rio Orinoco, which has been visited more or less intensively by almost all collectors, has been subdivided into three main sectors; the Ríos Casiquiare, Ventuari, and Atabapo are each one sector; and the Ríos Guainia-Negro drainage area comprises two sections. Often the limits of the areas coincide with those reached by several expeditions; thus area 4 (Rio Orinoco from San Fernando de Atabapo up to Esmeralda) ends at Esmeralda, because a large number of expeditions reached their limits on the Orinoco there.

The chronological sequence (Table 1) begins in 1800 and continues through 31 Dec 1982. Collecting activities that continued for more than a year are cited first by year, dash, blank space, no indication of month (e.g., 1969–); subsequent entries for such continuations are identified by “cont.” in the “Year” column. A year followed by a blank space (without indication of month) refers to an expedition started sometime during that year but with the exact date unknown. Month, dash, blank space (e.g., Sep–) indicates that the trip continues through the following year, ending in dash, month (e.g., –Mar). Doubtful date, collector, or place are accompanied by a question mark (?).

The combined chronological-geographical ar-
MAP 2.—Botanical collecting areas in T. F. Amazonas (circled numbers: 1–10 = lowland areas; 11–18 = upland areas; hatching denotes botanically unexplored areas; see p. 20 ff for numbered area definitions).
Table 1.—Chronological sequence of botanical exploration in T. F. Amazonas (for explanations see p. 9 and Map 2).

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<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Dec</td>
<td>Coppens</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>1981</td>
<td>–Dec</td>
<td>Clark, K.</td>
<td>x</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>cont.</td>
<td>Medina</td>
<td>x</td>
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<tr>
<td>cont.</td>
<td>Uhl</td>
<td>x</td>
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<tr>
<td>cont.</td>
<td>Clark, H.</td>
<td>x</td>
<td></td>
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<tr>
<td>cont.</td>
<td>Alès and Chiappino</td>
<td></td>
<td>x</td>
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</tr>
<tr>
<td>cont.</td>
<td>Guánchez</td>
<td>x</td>
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<tr>
<td>cont.</td>
<td>Buschbacher</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>1982</td>
<td>Jan–Feb</td>
<td>Steyermark et al.</td>
<td>x</td>
<td>x</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan–Feb</td>
<td>Guariglia et al.</td>
<td>x</td>
<td>x</td>
<td>by helicopter</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Feb</td>
<td>Ortiz and Narbaiza</td>
<td>x</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Feb–Mar</td>
<td>Huber</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mar</td>
<td>Guánchez</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May–Jun</td>
<td>Tillett and Huber</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May–Jun</td>
<td>Huber and Tillett</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Notes**:
- "by helicopter" indicates that the collectors were transported to the study site by helicopter.
- "orchids" indicates that the collectors were specifically searching for orchids.
- "cryptogams" indicates that the collectors were specifically searching for cryptogams (mosses, lichens, and other non-vascular plants).

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**Table 1.—Continued.**
<table>
<thead>
<tr>
<th>Year</th>
<th>Month(s)</th>
<th>Collector(s)</th>
<th>Lowlands</th>
<th>Uplands</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>1982</td>
<td>Jul</td>
<td>Huber et al.</td>
<td></td>
<td></td>
<td>x</td>
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<tr>
<td></td>
<td>Jul</td>
<td>Stergios and Aymard</td>
<td></td>
<td>x</td>
<td></td>
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<tr>
<td></td>
<td>Jul</td>
<td>Salaroli and Rucci</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td>Castillo</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td>Ruiz Zapata et al.</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td>Hernandez</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td>Parra</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Aug</td>
<td></td>
<td>Guánchez and Mercado</td>
<td></td>
<td>x</td>
<td></td>
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<tr>
<td>Aug</td>
<td></td>
<td>Croat</td>
<td>x</td>
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<td>Aug</td>
<td></td>
<td>Alés and Chiappino</td>
<td></td>
<td></td>
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<td>Oct</td>
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<td>Piñate</td>
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<td>x</td>
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<td>Oct</td>
<td></td>
<td>Lasi</td>
<td></td>
<td>x</td>
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<tr>
<td>Nov</td>
<td></td>
<td>Yerena</td>
<td></td>
<td>x</td>
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<tr>
<td>Nov</td>
<td></td>
<td>Guánchez</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Nov</td>
<td></td>
<td>Grubb</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>Nov–Dec</td>
<td></td>
<td>Coppens</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>–Dec</td>
<td></td>
<td>Clark, H.</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>–Dec</td>
<td></td>
<td>Dezzeo</td>
<td></td>
<td>x</td>
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<tr>
<td>cont.</td>
<td></td>
<td>Medina</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>cont.</td>
<td></td>
<td>Uhl</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>cont.</td>
<td></td>
<td>Guánchez</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>cont.</td>
<td></td>
<td>Buschbacher</td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

*Notes: x indicates presence, by helicopter.*
rangement of the expeditions and collectors in Table 1 should facilitate research concerning the intensity of botanical exploration of a given area, or months (or seasons) less-covered botanically. Generally speaking, the months between November and February/March are the “dry season,” whereas the remaining months from April to October/November are the “rainy season.” The dry season is more pronounced in the northern part of the Territorio and less in the southwestern portion, where annual mean precipitation reaches 4000 mm, no month having less than 100 mm. (Further climatic information in CODESUR, 1979; Huber, 1982a,b.)

Following are the definitions of the 18 areas delimited in Map 2 and referred to in Tables 1 and 2.

Lowlands (areas 1–10).

1. Rio Orinoco from its confluence with the Rio Meta in the north to its confluence with the Rio Atabapo to the south; this area also includes the lowlands extending east of the river to the base of the Serranía Cuao-Sipapo, including, therefore, the lowland sections of the Ríos Cuao, Autana, Sipapo, and Guayapo. A large part of these lowlands forms the “Reserva Forestal Sipapo” (Sipapo Forest Reserve). The northern section of this area includes the road from Sanaríapo (or Samariapo, as it has been recently spelled) to Puerto Ayacucho and north to El Burro (Puerto Nuevo) in front of the mouth of the Rio Meta. To the southeast of Puerto Ayacucho the lower valley of the Río Cataniapo, sometimes called Gavián, also is included. Area 1, as defined here, further includes Isla Ratón and other islands in the Río Orinoco.

2. Basin of Río Manapiare, including the lowland sections of the Río Manapiare, the Río Parucito, and part of the lower Río Asita to the east.

3. Basin of Río Ventuari, from its headwaters at approximately 500 m above sea level to its confluence with Río Orinoco; here included are all settlement areas along the Río Ventuari, such as (downstream to upstream) Kanaripó (south bank), Carmelitas (or Yacu-ray, older name no longer in use) (south bank), Marueta (southeast bank), Maco (northwest bank), Ten-cua (north bank), and Cacurí (east bank). Cerro Moriche, located at the western shore of the middle Ventuari, reaches approximately 800 m elevation. Despite its height, it has been maintained here in this lowland area, since its vegetation does not show a marked differentiation of an upland type.

4. Río Orinoco, between the confluence with Ríos Atabapo/Guaviare, and Esmeralda, mainly a riverine area extending approximately 3–5 km on each side of the river. Here also included are the following settlements and their surroundings: Minicio (Minisio), Patacame, Trapichote, Santa Bárbara, Macurucu, Piedra Blanca, Guachapana (often misspelled, e.g., “Guapuchana” by Foldats), Caridad, San Antonio (including the savanna of San Antonio), Boca Yagua, Puruname, Guaname (or Guanami), Maricapana, Cariche (including the low Cerro Cariche), Trocapure, Marcapure, Tamatama, Punta Piaroa, and Esmeralda.

5. Lowland plains extending between the Río Ventuari (lower course, on the north), Río Orinoco (on the west and south), Río Cunucunuma and Cerro Huachamacari (on the east). These plains are drained by four rivers (from northwest to southeast): Río (or Caño) Yagua, Río Puruname (wrongly indicated on the CODESUR map (1975, 1:1,000,000) as Río Guaname), Río (or Caño) Guaname, and Río Cunucunuma. This area also contains the “Yapacana savannas I, II, and III,” located to the west of Cerro Yapacana between the Río Orinoco with its affluent Caño Cotúa (sometimes called Caño Yapacana) and the western edge of Cerro Yapacana. Approximately 20 km to the east of Cerro Yapacana, a small lagoon, Laguna Yagua, with many floating islands, gives rise to one of the upper tributaries of the Río Yagua.

6. Lowland plains extending between the Río Orinoco on the north and east, Caño San Miguel (or Conorochite) on the south, Río Atabapo, Guasacavi, and Guainia on the western border of the T. F. Amazonas with Colombia. This area forms part of the Casiquiare peneplain proper, and is drained by a small river system flowing mainly from east to west or northwest into the Río Atabapo or Río Guainia. These main tributaries are (from north to south): Caño Caname, Río Atacavi, Río Temi, and Río Guasacavi, all affluent of the Río Atabapo; and Caño Pimichín and Caño San Miguel, tributaries of the Río Guainia.

7. Area of the lower Río Guainia and uppermost (Venezuelan) Río Negro, mainly a riverine region, including all major settlements along the Río Guainia (San Miguel, Democratia, Comunidad, Santa Rita), and the Río Negro (San Carlos, Laja Alta, Santa Rosa de Amanadona, Santa Lucía, El Carmen, San Simón de Cocui). This area also includes the region of the mouth of Brazo Casiquiare up to Solano (which is now connected to San Carlos on the Río Negro by a road of about 20 km), as well as the famous Piedra Cucui (Cucuy in Brazilian spelling), an isolated granitic hill near the Venezuelan-Brazilian-Colombian frontier.

8. Brazo Casiquiare (also called Río, Caño, Canal), connecting the Río Orinoco near Tamatama with the Río Guainia and giving rise to the Río Negro. The
Table 2.—Botanical exploration of mountains and other upland regions in T. F. Amazonas
(for explanations see "Chronological and Geographical Synopsis" and Map 2).

<table>
<thead>
<tr>
<th>Mountain (Area)</th>
<th>Collectors (Year of trip)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerro Aracamuni (18)</td>
<td>Huber &amp; Medina (1981)</td>
</tr>
<tr>
<td>Cerro Aracapo (11)</td>
<td>Hermoso (1978)</td>
</tr>
<tr>
<td>Cerro A'roko = Parú (13)</td>
<td>Hoyos (1973)</td>
</tr>
<tr>
<td>Cerro Asisa = Parú (13)</td>
<td>Steyermark (1971)</td>
</tr>
<tr>
<td>Cerro Autana (11)</td>
<td>Cardona (1972); Dunsterville (1972)</td>
</tr>
<tr>
<td>Cerro Avispa (18)</td>
<td>Cardona (1972); Dunsterville (1972)</td>
</tr>
<tr>
<td>Cerro Calentura = Ualipano (12)</td>
<td>Maguire et al. (1951); Huber (1979)</td>
</tr>
<tr>
<td>Cerro Camani (12)</td>
<td>Cardona (1971)</td>
</tr>
<tr>
<td>Cerro Cayenama (16)</td>
<td>Maguire &amp; Maguire (1953)</td>
</tr>
<tr>
<td>Cerro Corocoro (12)</td>
<td>Tate (1928–1929); Steyermark (1944); Maguire &amp; Maguire (1949); Barnés (1950); Maguire et al. (1950); Fariñas et al. (1969); Ferrigni et al. (1975); Tillett et al. (1975); CASUB (1979); Steyermark et al. (1981); Steyermark et al. (1982); Guariglia et al. (1982); Guanchez (1982)</td>
</tr>
<tr>
<td>Cerro Fuif = Marahuaca (14)</td>
<td>Maguire et al. (1951)</td>
</tr>
<tr>
<td>Cerro Guanay (12)</td>
<td>Maguire et al. (1950); Steyermark et al. (1982); Guariglia et al. (1982)</td>
</tr>
<tr>
<td>Cerro Huachamacari (14)</td>
<td>Huber (1980)</td>
</tr>
<tr>
<td>Cerro Mahedi (16)</td>
<td>Tillett et al. (1975); Maguire et al. (1981); Steyermark et al. (1981); Steyermark et al. (1982); Guariglia et al. (1982)</td>
</tr>
<tr>
<td>Cerro Marahuaca (14)</td>
<td>Maguire et al. (1951)</td>
</tr>
<tr>
<td>Cerro Moriche (3)</td>
<td>Matos (1958)</td>
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<tr>
<td>Cerro Morrocoy (12)</td>
<td>Maguire et al. (1953–1954); Maguire et al. (1957–1958); Ewel (1964); Maguire et al. (1965–1966); Steyermark et al. (1970)</td>
</tr>
<tr>
<td>Cerro de la Neblina (18)</td>
<td>Schomburgk (1839); Cardona (1940–1941); Vareschi (1967); Cardona (1971); Steyermark (1973); Colchester (1979–1980); Alès &amp; Chiappino (1980–1982); Huber (1980); Huber (1981, two trips); Guanchez (1982)</td>
</tr>
<tr>
<td>Cerro Paraque = Sipapo (11)</td>
<td>Phelps et al. (1949); Cowan &amp; Wurdack (1951); Hoyos (1975); Huber (1979, two trips)</td>
</tr>
<tr>
<td>Sierra Parima (16)</td>
<td>Phelps (1946); Maguire et al. (1948–1949); Maguire et al. (1981); Steyermark et al. (1981)</td>
</tr>
<tr>
<td>Sierra Tapirapeco (17)</td>
<td>Cardona (1945–1946)</td>
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<td>Cerro Ualipano (12)</td>
<td>Cardona (1962); Brewer-Carías (1962)</td>
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<tr>
<td>Sierra de Unturán (17)</td>
<td>Guanchez (1981)</td>
</tr>
<tr>
<td>Cerro Vinilla (17)</td>
<td>Huber (1981, two trips)</td>
</tr>
<tr>
<td>Cerro Yapacana (15)</td>
<td>Maguire et al. (1951); Steyermark &amp; Bunting (1970); Rogers (1979); Thomas (1979)</td>
</tr>
<tr>
<td>Cerro Yavi (12)</td>
<td>Phelps (1947)</td>
</tr>
<tr>
<td>Cerro Yutajé (12)</td>
<td>Maguire &amp; Maguire (1953)</td>
</tr>
<tr>
<td>Pico Zuloaga = Neblina (18)</td>
<td></td>
</tr>
</tbody>
</table>
area includes the river shores from Solano at the lowermost portion up to near the bifurcation of the Rio Orinoco. Important and often-mentioned places and settlements along Brazo Casiquiare are (from southwest to northeast): Piedra Culimacari, Piedra Vanari [Schomburgk] or Guanari, Buena Vista, Quebrabuena, Curare, Laguna Pasiba (or Vasiva or Baciba), Deshecho, Capibara (or Capihuara).

9. Area of uppermost Rio Orinoco, above Esmeralda to the headwaters of the river. This area also includes the lowlands to the east between the Rio Orinoco and the Sierra Parima, drained by the following rivers (from north to south): Rio Padamo, which is formed by the tributaries Rio Cuntinamo, Rio Uotamo (or Botamo), and Rio Matacuni; then, further south, Rio Ocamo with its main affluent Rio Putaco and Caño Jenita; Rio Manavicche, and, above Raudal Guaharibos, Rio Potomuco (also called Rio Orinoquito). From the south, the only major tributary of the upper Orinoco is the Rio Mavaca. Important settlements in this area are: Misión Padamo, Ocamo (also called Santa María de los Guaiacas), Mavaca, Platanal (Indian name Mahekodo-teri), and Guabutuguy-teri. Most commonly mentioned rapids ("raudal" or "salto") of the uppermost Orinoco are Raudal Guaharibos (which for a long time has been the chief obstacle hindering further upstream explorations), Raudal Peñascal, and Raudal Arata on the middle Rio Ocamo.

10. Lowland plains in the southwesternmost region of the Territorio. This area is limited on the north by the lower Brazo Casiquiare (area 8), on the east by the Rio Siapa and the mountain range of Cerros Nebina, Avispa and Aracamuni, on the southwest by the Venezuelan-Brazilian border, and on the west by area 7 (Rio Negro). These extensive lowlands are drained mainly by two rivers, the Rio Siapa and Pacimoni (or Pasimoni) formed by the confluence of the Rios Baria and Yatúa. The only important settlements or often-mentioned older places in this very sparsely populated region are Pueblo Viejo on the lower Pacimoni (no longer existing), San Custodio, and Santa Izabel (former rubber stations visited by Spruce, but also no longer existing). Along the Rio Yatúa two granitic hills have been visited repeatedly by botanists: Laja Catipán on the north bank shortly above the confluence with the Rio Baria, and Piedra Araucuaua on the left bank of the middle Rio Yatúa, approximately to the west of Cerro Avispa.

Uplands (areas 11–18).

11. The massif formed by Cerro Cuao, Cerro Sipapo (or Paraque), Cerro Autana, and Sierra Guayapo including Cerros Aracapo and Ouana (or Ovana).

12. The mountain range formed by Cerros Guanay, Corocoro, Yutajé, Yavi, and Ualipano (or Cerro Calen-
ceased collectors, a serious attempt has been made to reconstruct their collecting itineraries and activities from the labels of their collections deposited at VEN, MER, MERF, MY, MYF, US, and NY, or from pertinent literature. In some cases the forms were not returned in time and in other cases the reconstruction of data from the labels has been more or less unsuccessful, and so the data on collecting activities or itineraries in T. F. Amazonas are missing or incomplete for several collectors.

Generally, the data provided in the list for each main collector are the following:

Last name, given names  
Year of birth and death; citizenship at actual time of visit to T. F. Amazonas; profession (institution for which expedition was made).
Period of collecting activity in T. F. Amazonas: itinerary (names of any co-collectors).
Numbers of plants collected during specified period; main herbaria where the Amazonas collections from this period are deposited.

Notes.
Publications related to collector’s Amazonas activities or specimens.

“Numbers of plants collected” are indicated in two ways: if preceded by “Nrs.” the digits refer to the numbering sequence used by the collector; if followed by “nrs.” the digits refer to the total number of plants collected, in cases where the collector’s numbering system is unknown or unusable for this study.

In the case of co-collectors, the number of specimens and their herbaria disposition are omitted. The name of the main collector is given (in capitals), to which the reader is referred for further information.

Finally, some general information is included in this list on frequently cited institutions, such as CODESUR, MARNR, IVIC, UCV, etc., in order to explain the meaning of their acronyms and their main activities related to botanical research in T. F. Amazonas.

Adderley, Lincoln  
29 May–8 Aug 1959: Middle and upper Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainia, Río Pacimoni, and Río Siapa (with J.J. WURDACK).

Agosti1, GETULIO  
1943–; Venez.; Botanist (Instituto Botanico, Caracas).  
Nrs. 1500–1579; VEN, NY, P, MYF.  
Notes: Specialist in Venezuelan Boraginaceae and Myrsinaceae. Notebooks of this trip have been lost.

Akermans, Louis M.A.  
194?–; Dutch; Botany exchange student (Univ. of Utrecht, UCV, Fac. de Agronomía, Maracay).  
6–19 Jul 1969: Puerto Ayacucho and surroundings, San Fernando de Atabapo and surroundings, Río Atabapo, Yavita, Maroa, Caño Casiquiare (with G.S. BUNTING and J. van Rooden).

Alès, CATHARINE  
1952–; French; Ethnologist.  
Approximately 200 nrs., irregularly numbered; MYF, VEN.  
Notes: Anthropological research on Yanomami Indians; also collected living material (“magic” plants, cultivated Yanomami plants) grown later at S. Tillett’s home.

Anduze, Pablo J.  
1902–; Venez.; Entomologist.  
Oct–Nov 1951: Upper Río Orinoco, from confluence with Río Ugueto up to the sources of Río Orinoco.  
Notes: Member of the French-Venezuelan expedition to the sources of the Río Orinoco, 1951. Anduze continued the botanical collecting activities after the departure of L. CROIZAT at the confluence of Ríos Orinoco and Ugueto (24 Oct 1951). Nevertheless, the labels of all botanical specimens bear only Croizat’s name.

6 Dec 1965–6 Jan 1966: Río Cataniapo, Sa-
mariapo, San Fernando de Atabapo, Santa Bárbara, Tamatama, Río Matacuni, Río Padamo, Río Cuntinamo, Río Casiquiare down to Caño Caripe (with G.C.K. Dunsterville).

Publication: Anduze, s.d. [1958?].

ARAQUE MOLINA, JORGE
1928– ; Col.; Botanist? (Fac. Nac. de Agronomía de Medellín).
24 Nov 1948: San Fernando de Atabapo and vicinity (with F.A. Barkley).
Small set (approximately 150 nrs.) collected in Venezuela; MEDEL, US, COL.
Notes: Used a compound numbering system, e.g., "18.V.42." "V" possibly represents "Venezuela," definitely not the month. Sometimes cited as Molina & Barkley.

ARENDS, ERNESTO
1952– ; Venez.; Forester (ULA, Fac. de Ciencias Forestales, Mérida).
Nrs. 06–18; MER, VEN, MYF.
Notes: Exclusively trees.

ARGUMOSA, JOSE ANGEL DE
19??– ; Venez.; Physician ("Médico Indigenista," Ministerio de Sanidad y Asistencia Social).
21 Apr–12 May 1967: Macapo [Río Cunucunuma], Caño Casiquiare, Río Orinoco, Ocamo, Mavaca, Platanal, La Esmeralda, Tamatama, Caño Cariche, Santa Bárbara (savanna and rapids).
Nrs. 1–122; VEN.
Notes: Also made some later collections (Aug 1967). Notebooks at VEN.

ARISTEGUIETA, LEANDRO
1923– ; Venez.; Botanist (Instituto Botánico, Caracas).
Nrs. 7329–7465 [not confirmed]; VEN.
Notes: Specialist on Venezuelan Compositae and Annonaceae.

Asociación Venezolana Para el Avance de la Ciencia (AsoVAC) [Venezuelan Association for the Advancement of Science]
Jan–Feb 1969: Sponsored the first helicopter expedition (scientific multidisciplinary) to T. F. Amazonas (Cerro Duida, Esmeralda, upper Orinoco, Canal Casiquiare). See FARÍNAS, MARIO.

Aymard, Gerardo
1959– ; Venez.; Forestry technician (UNEL-LEZ, Guanare, Portuguesa).
20–30 Jul 1982: San Carlos de Río Negro and Solano, Río Negro, lower Casiquiare, upper Pacimoni up to lower Río Yatúa (Parque Nacional "Serranía de la Neblina") (with B. Stergios).

BALDWIN, JOHN THOMAS, JR.
1910–1974; U.S.; Botanist (College of William and Mary, Virginia).
2 Mar 1944: Río Negro, at base of Cerro Cucuy.
Small set (50 nrs.); US, IAN (fide Index Herbariorum), NY.
Notes: Member of the "US Rubber Exploring Agency in Brazil" during World War II.

Balick, Michael Jeffrey
Notes: Specialist on neotropical palms.

Barkley, Fred A.
1908– ; U.S.; Botanist (Fac. Nacional de Agronomía de Medellín).
24 Nov 1948: San Fernando de Atabapo and vicinity (with J. Araque Molina).
Notes: Expert on New World Anacardiaceae. Collected widely in Colombia and Argentina (approximately 20,000 nrs. in Colombian collection), also in Guatemala, Iraq, Africa.

BARNES, VENTURA
19??– ; U.S.; Ornithologist (Puerto Rico?).
Apr–Jun 1950: Base of Cerros Marahuaka, Kushamakári (= Huachamacari; base), and upper Río Cunucunuma.
Approximately 91 nrs. at VEN, NY, [and Puerto Rico?].
Notes: Expedition sponsored by the United Nations; other participants Marc de Civi- rieux, René Lichy, and Ildefonso Villegas. Publication: Lichy, 1978.

Bautista, Jaime
1928– ; Venez.; Forestry technician (ULA, Fac. de Ciencias Forestales, Mérida).

Berry, Paul E.
1952– ; U.S.; Botanist (CODESUR, Caracas).
21–29 May 1975: Santa Bárbara del Orinoco, Macuruco, Maraya, Caño Moyo, Caño Guachapana.
28–30 Jun 1975: Puerto Ayacucho to Samariapo (with A. Gentry).
17–24 Sep 1975: San Carlos de Río Negro, road to Solano (IVIC study sites) (partly with C. Uhl and E. Brunig).
Nrs. 1350–1566.
11–13 Oct 1975: Río Manapiare, Terecay to San Juan de Manapiare.
Nrs. 1567–1611.
6–8 Nov 1975: Valle de Manapiare.
Nrs. 1652–1660.
Nrs. 2045–2100, 2110–2129.
29 Feb 1976: San Fernando de Atabapo.
Nrs. 2101–2109.
Nrs. 2133–2198.
Nrs. 2206–2262.
Nrs. 2263–2271.
Nrs. 2272–2275.
26 Jun 1976: Pozo Carlina [west of San Juan de Manapiare, near Cerro Morrocoy].
Nr. 2276.
11 Jun 1977: Road to Gavilán [valley of Río Cataniapo, southeast of Puerto Ayacucho] (with J.A. Steyermark, O. Huber, and P. Redmond).
12 May 1978: Riverine forests around Santa Bárbara del Orinoco (with J.A. Steyermark, O. Huber, and P. Redmond).
Notes: All collections are deposited at MYF, VEN, MO.
Publication: Berry, 1976.

Blake, Emmet Reid
1908– ; U.S.; Ornithologist.

Blanco, Carlos A.
1940– ; Venez.; Forester (Instituto Botánico, Caracas).
May 1971: Reserva Forestal del Sipapo.
Nrs.
1085–1136: Campamento Laja de Garza.
1137–1170: Left bank of Río Sipapo, Block I.
1171–1201: Right bank of Río Sipapo.
1202–1225: Block II.
1226–1240: Margins of Río Sipapo.
1241–1265: Margins of Caño Guaca, affluent of Río Sipapo.
1266–1270: Río Cuao, Raudal del Danto.
1271–1290: Río Cuao between mouth of Río Sipapo and Raudal Danto.
1291–1292: Margins of river [Cuao?].
Notes: All collections are deposited at VEN.

Bonpland, Aimé Jacques Alexandre
1773–1858; French; Botanist.
13 Apr–2 Jun 1800: Río Orinoco, Río Atabapo, Yavita, Caño Pimichín, Río Guainía, San Carlos de Río Negro, Caño Casiquiare, Esmeralda, Río Orinoco (with A.V. Humboldt; see Map 4)

Bossio, Higinio
Approximately 50 nrs.; VEN, NY?
BRAUN, August  
1921- ; Venez.; Horticulturist (Jardín Botánico, Caracas).
Jan 1964: Puerto Ayacucho, Río Orinoco to San Fernando de Atabapo and Platanal.
Few nrs.; VEN.
Notes: Specialist on Venezuelan palms.

BRETEL IER, F.J.  
1932- ; Dutch; Forestry botanist (Instituto Forestal Latino Americano (IFLA), Mérida).
Nrs. 4688-4891; WAG, VEN, US, U, NY.

BREWER-CARÍAS, CHARLES  
1938- ; Venez.; Explorer, dentist.
Approximately 30 nrs.; VEN.
Sep 1980: Laguna Autana [Laguna “Leopoldo”].
Few bromeliads; VEN.
15 Jan 1981: Cerro Marahuaca, Cerro Sipapo (with B. MAGUIRE, C. Maguire, and J.A. Steyermark).
15-17 Feb 1981: Ocamo to Esmeralda, Cerro Marahuaca, Cerro Duida, Cerro Sipapo, Puerto Ayacucho (with J.A. STEYERMARK and R. Liesner).
Notes: For botanical results of Brewer-Carías Amazonas expeditions, see STEYERMARK.

Broome, C. Rose  
1939- ; U.S.; Botanist (U.S. Department of Agriculture).
21 Mar-20 Apr 1981: San Carlos de Río Negro and vicinity (with G.M. CHRISTENSON and F. Delascio).

BROWN, KEITH S., JR.  
1938- ; U.S.; Entomologist, biogeographer (Univ. de Campinas, Brazil).
22 Dec 1980-21 Jan 1981: Upper Río Ventuari (Téncua, Caño Negro, Maco), San Juan de Manapiare, Puerto Ayacucho.
11 nrs.; MYF.
5-6 Jan 1981: Puerto Ayacucho and surroundings (with S. TILLETT).
Notes: Voucher specimens for entomological and ecological observations.

BRÜCHER, HEINZ  
19??- ; Germ.; Botanist (UCV, Fac. de Ciencias, Caracas).
May 1966: Esmeralda.
1 specimen (Pitcairnia patentiflora) in VEN.

BRÜNIG, EBERHARD F.  
1926- ; Germ. and Brit.; Forester (World Forestry Institute, Hamburg, West Germany).
Aug-Nov 1975: San Carlos de Río Negro and vicinity (IVIC study sites; mainly Amazon Caatinga, High Forest and Bana).
Nrs. VEN 1-VEN 371; VEN.
Notes: Responsible for forest inventory of the study sites around San Carlos de Río Negro as part of the MAB-UNESCO-IVIC research project. A portion of the collections has been lost.

Budowski, Gerardo  
1925- ; Venez.; Agronomist, silviculturist.

BUNGEROTH, E.  
18??-1937; Germ.; (?)  
1886-1893(?): Collected orchids in T. F. Amazonas (San Fernando de Atabapo).
Notes: Cited by Couret, 1982a,b.

BUNTING, GEORGE S.  
7 Nov 1953–18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Yatúa, Cerro Neblina (with B. Maguire and J.J. Wurdack).
6–19 Jul 1969 (with L.M.A. Akkermans and J. van Rooden):
Nrs.
3571–3592: Río Orinoco, San Pedro.
[3593–3623: Colombia].
3624–3630: Río Orinoco, between San Pedro and San Fernando de Atabapo.
3631–3649, 3674–3682: Río Orinoco, Siquita.
3650–3663: Río Atacavi.
3664–3678, 4123: Río Temi.
3896–3909: Yavita-Pimichín road.
4019–4059: Río Temi, near Yavita.
3985–4015, 4097–4108: Río Guainía, vicinity of Maroa.
3986, 3990, 4016, 4017: Pimichin.
4060–4096: Caño Pimichín.
4126–4147: Vicinity of San Carlos de Río Negro.
MY, U, VEN.
28–30 Dec 1969:
Nrs.
4237–4255: Río Orinoco, between Samariapo and a place 3 hours upstream.
MY, VEN.
8 Apr–8 May 1970: Río Pacimoni, Río Yatúa, Río Casiquiare, San Carlos de Río Negro, Maroa, Pimichín, Río Atabapo, Caño and Cerro Yapacana (with J.A. Steyermark).
Nrs. 4287–4292.
MY, VEN.
Notes: Specialist on Venezuelan Araceae.
BUSCHBACHER, ROBERT
1954–; U.S.; Plant ecologist (Univ. of Georgia, Athens, Georgia).
1 Jul 1980–present: San Carlos de Río Negro and vicinity (VIC study sites).
Nrs. 6, 10, 19, 22, 28, 39, 46–61, 71–73; VEN, MO.
Notes: Research on pasture management in tropical forest; botanical collections are related to this research.
Camico, J.
19??–; Venez.; Field assistant (CODESUR-MARNR, Zone 10, Puerto Ayacucho).
Apr 1978: Río Orinoco, San Fernando de Atabapo, Santa Bárbara (with G. Morilgo and N. Suárez).
CAMPOS, RÉGULO
19??–; Venez.; Resident of Esmeralda?
Nov–Dec 1966: Esmeralda
Approximately 20 nrs.; VEN, NY?
Canales, Hector
1952–; Chil.-Venez.; Forester (CODESUR-MARNR, Zone 10, Puerto Ayacucho).
25 Jan–1 Feb 1977: San Juan de Manapiare and surroundings (with O. Huber).
Publications: Chesney, 1979; Canales and Catán, 1981.
CARABOT C., ALFREDO
1939–; Venez.; Pharmacist (ULA, Fac. de Farmacia, Mérida).
Jun 1980: Puerto Ayacucho and surroundings, Gavilán (with A. Morales).
Approximately 50 nrs.; MERF.
Notes: Plant collections made for pharmacoc-chemical screening at Fac. de Farmacia, ULA, Mérida.
Publication: Carabot and Usubillaga, 1981.
CARDENAS DE GUEVARA, LOURDES
19??–; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).
9 Jan 1978: Puerto Ayacucho and surroundings (with O. Huber and M. Pyykkö).
Nrs. 2684–2685A–D; MY.
5–10 Jan 1978: Puerto Ayacucho and sur-
roundings (with O. Huber and M. Pyykkö).

Notes: Specialist on Venezuelan Mimosoideae.

**Cardona Puig, Felix**

1903–1982; Venez.; Explorer, geographer.

Notes: Due to the significance of this famous explorer of the Venezuelan Guayana region, the following account, taken from Cardona's personal notes, indicates with more detail than usual his itineraries in Venezuelan Amazonas.

**Oct 1929–Jan 1930:** Accompanied the Venezuelan Frontier Commission to Ríos Orinoco, Casiquiare, and Negro down to Piedra Cocuy [must be the same expedition joined by Holt and Gehriger of the National Geographic Society; Cardona did not collect plants on this expedition].

**Nov–Dec 1930:** Entered the headwaters of Río Ventuari (Antauare) proceeding from the upper Río Erebato passing over Cerro Uemachú (dividing range between the Río Erebato and the Río Ventuari basins). At the beginning of Dec 1930 reached Raudal de Uraca (del Mono) on the upper Río Ventuari; about the middle of Dec 1930 reached Yakurai (Las Carmelitas) on the lower Ventuari; continued to the Ríos Orinoco, Casiquiare and Negro, where he joined again the Venezuelan Frontier Commission [including Holt and Blake of the National Geographic Society], with which he returned to Maypures in Jan 1931 [no plants were collected by Cardona on this expedition].

**Nov–Dec 1930:** Expanded the appointment as "Jefe de exploraciones en la Oficina de Fronteras," Ministerio de Relaciones Exteriores. During this period he made the following two expeditions in T. F. Amazonas:

**Nov 1939–Apr 1940:** Upper Ventuari, Sabana del Oso, 300 m.

Nrs. 356–364 (12 Mar 1940); upper Ventuari to Caura, 760 m.

Nrs. 365 (5 Mar 1940).

**Nov 1940–May 1941:** Orinoco, Ventuari, contact zone between Sierra Parima and Sierra Pacaraima, along Sierra Parima to the south (Cerros Caransacá, Arajame, Cadimani), headwaters of Río Ocamo.

Nrs. 151–154, 156–162 (Sabanas Budare, upper Ventuari, 300 m, 15 Nov 1940).

Nrs. 150, 155, 163–167 (upper Ventuari, Río Jenete, 500–600 m, Dec 1940).

[Note irregular numbering of collections on these two expeditions.]

**Jul–Dec 1942:** Expedition to Orinoco, Ventuari, Salto Ekenkua [Têncua], Río Kaná (right tributary of Río Ventuari), Cerro Manacha [Manaca] (height-of-land between headwaters of Río Ventuari and Río Erebato).

[No plants collected on this expedition by Cardona.]

**Sep 1944–Nov 1945:** Employed by an American company for rubber exploitation in the Orinoco-Casiquiare region.

**Dec 1945–Jun 1946:** Joined the Venezuelan-Brazilian Boundary Commission in their expedition to Río Amazonas, Río Negro, headwaters of Río Padauri (Brazil), and Río Siapa (or Matapiri, Venezuela).

Nrs.

[1251–1314: Río Padauri, Brazil, Jan–Feb 1946].

1315–1369: Headwaters of Río Siapa, 550 m, 11 Mar 1946.

[1370–1446: Río Castanho, Brazil, 16–24 Feb 1946.]

1447–1521: Brazilian-Venezuelan frontier, Post 4, 1260 m; Río Vasiva, 55 m; Post 2; Post 3; Feb 1946.

[Note irregular numbering with respect to temporal sequence.]

**Jun 1946:** Appointed as "Explorador botánico del Departamento de Investigaciones Forestales."

Since 1949 with Cartografía Nacional, División de Geodesia del Ministerio de Obras Públicas (MOP).

**Jul–Nov 1951:** Member of the French-Venezuelan expedition to the sources of the Río Orinoco.
Feb 1962: Cerro Ualipano [or Cerro Calentura, upper Parucito valley]
Nrs. 2919–2943.
Mar 1971: Cordillera Parima, summit of Cerro Cayenama, frontier with Brazil (3°58’N, 64°40’W, 1750 m).
Few nrs., among them nr. 3077 (= Escobedia parimensis Pennell, new species).
Dec 1972: Summit of Cerro Avispa, Río Siapa (approximately 1°30’N, 65°51’W, 1510 m) (with G.C.K. and E. Dunsterville).

Cardona’s collections have been distributed to US (more than 1200 nrs. up to 1965); other sets in VEN, NY.
Notes: Referring to Cardona, Prance (1971) cites: “Amazonas, Upper Río Negro, Río Padauiri, 1943” [instead of 1946].

CASTILLO, ANIBAL
1950–; Venez.; Botanist (UCV, Fac. de Ciencias, Caracas).
Nrs. 735–833; VEN.
23 Jul–5 Aug 1981: Puerto Ayacucho to Samariapo and vicinity; Río Cataniapo.
Nrs. 1200–1461; VEN.
Nrs. 1510–1552; VEN.

Catalán, Américo
1947–; Chil.; Forester (MARNR, Zone 10, Puerto Ayacucho).
Nov 1977: Reserva Forestal Sipapo (with G. Morillo).
Jul 1978: Gavilán, valley of Río Cataniapo (with O. Huber).
Publication: Catalán, 1980.
Centro de Actividades Subacuáticas de la Universidad de Oriente, Cumaná (CASUB).
26 Jan–13 Feb 1979: Esmeralda and surroundings; southern slopes of Cerro Duida up to approximately 1500 m.
Approximately 300 nrs., deposited at UDO, Cumaná.
[Information furnished by Freddy R. Navarro P.]

Cerda, Julio
1945–; Chil.; Zoologist (CODESUR-MARNR, Caracas).

CHAFFANJON, JEAN
1854–1913; French; Explorer, botanist.
Apr–Dec 1886: Upper Orinoco up to Raudal Guaharibos.
9 Apr: Arrived at Ciudad Bolívar.
17 Sep: Between mouth of Río Meta and Atures.
19 Sep: Arrived at Atures.
1 Oct: Leave for Maypures.
12 Oct: Entering San Fernando de Atabapo.
2 Nov: Leave San Fernando de Atabapo.
4 Nov: Piedra Minisio.
5 Nov: Patacame.
6 Nov: Estuary of Ventuari.
7 Nov: Leave Santa Bárbara.
9 Nov: Isla Perro de Agua.
15 Nov: Front of Cerro Yapacana.
17 Nov: Río Puruname.
18 Nov: Isla Guanami.
20 Nov: Caño Ticanamori.
21 Nov: Cariche.
24 Nov: Junction Orinoco-Cunucunuma; up the Cunucunuma to Aramari’s village above Raudal Chipirina.
29 Nov: Back to the Orinoco.
30 Nov: Bifurcation Orinoco-Casiquiare.
1 Dec: Esmeralda.
2 Dec: Caño Iguapo.
5 Dec: Isla Chiguire, Boca del Río Padamo.
7 Dec: Piedra Mapaya.
8 Dec: Boca Río Mavaca.
9 Dec: Caño Manaviche.
13 Dec: Raudal Guaharibos.
18 Dec: “Sources” of the Río Orinoco.
Notes: Chaffanjon’s main set of plants is deposited at P (apparently 565 nrs. from Venezuela), where the specimens have been studied by Maury, published in Journal Botanique du Paris, 1889 [fide Arnal, 1943].
Publication: Chaffanjon, 1889.
Chesney L., Luis
1944-; Chil.-Venez.; Forester (CODESUR, Caracas).
26 Feb–2 Mar 1976: Trapichote west of Santa Bárbara del Orinoco (with P. Berry).

Chiappino, Jean
1939-; French; Physician, anthropologist.
Apr 1980–Aug 1982: Sierra Parima, headwaters of Río Putaco and Río Orinoquito (with C. Alès).

Christenson, Gudrun M.
1923-; U.S.; Botanist (U.S. Dept. Agric.).
Nrs. GMC-1421–1425 (10 Apr 1981) (with K. Ennis Clark, Caño Marimajari, south of San Carlos); VEN, NY, pers. herb. at Athens, Ga.
Notes: Bulk samples of plants for Anti-Cancer Screening Program of the Cancer Chemotherapy National Service Center, National Cancer Institute. Collected also duplicate bulk samples for parallel Venezuelan research.

Clark, Howard Lamar
1941-; U.S.; Botanist (Univ. of Georgia, Athens, U.S.A.; IVIC, San Carlos de Río Negro).
11 Nov 1977–Dec 1982: Resident botanist in San Carlos de Río Negro from 1977 to 1981. Majority of collections were between San Carlos de Río Negro and Solano, also flooded forest collections (“rebalse” forest) within 40 km of San Carlos on Ríos Negro, Guainia, and Casiquiare. One short trip to Maroa, near town. One day (helicopter trip) to Río Yatúa near mouth into Río Pacimoni (approximately 1°30’N, 66°25’W, Apr 1980). Botanical collections continued to be made by trained workers until end of Dec 1982.
Nrs. 6402–8312 (until Sep 1982) (included some other collections outside of T. F. Amazonas); VEN, MO, NY, pers. herb. at Athens, Ga.
Publication: Clark and Liesner, in prep.

Clark, Kathleen [nee Ennis]
Approximately 30 nrs. as main collector.
Approximately 30 nrs. as co-collector with H. Clark; VEN, NY.
Publication: K. Clark, in press.

Colchester, Marcus E.M.
1953-; Brit.; Ethnobiologist, social ecologist.
Sep 1975–Aug 1976: Río Ventuari upstream from Las Carmelitas [Yacurai], middle and upper Ventuari basin, Río Manapiare basin (with J.R.A. Lister, joint collections).
Approximately 1350 nrs. (nrs. 1–750 approximately, under Lister & Colchester; nrs. 2001–2700 approximately, under Colchester & Lister); MYF, K, VEN, St. Bartholomew’s Medical College, London.
Notes: “Proyecto Ventuari,” supported by CODESUR and UCV, Caracas. Ethnobotanical research on Guahibo, Hohontu, Hoti, Makiritari, Piaroa, Sanemá, and Yavarani Indians.
Publications: Colchester and Lister, ms; Colchester, ms.
Nrs. 3000–3500 approximately, with gaps of approximately 200 nrs.; MYF, K, VEN.
Notes: Ethnobiological research on Sanemá Indians.
Publications: Colchester, 1982, in press.

Colvee, Pablo
1943-; Venez.; Geologist (CODESUR, Caracas).
2–9 Feb 1975: Cerro Marahuaca (with S. Tillett).

Government development agency established 3 Jul 1969 and attached to the Ministerio de Obras Públicas (MOP). Originally implemented to develop the natural resources of T. F. Amazonas and adjoining Distrito Cedeno of Estado Bolivar, and subsequently to initiate major settlement policies in the region. After 1975, emphasis was focused on basic research relating to the natural resources included in T. F. Amazonas. In April 1977, CODESUR was transferred to the newly created Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), where it became known as “Oficina para Estudios Especiales en la Región sur.” CODESUR ceased its activities by 31 December 1979; its functions have been taken over partially by the regional office of MARNR in Puerto Ayacucho (“Zona 10” of MARNR).

COPPENS, WALTER
1937–; Belgian; Anthropologist (Fundación La Salle, Caracas).
Nrs. 101–115; MYF.
Notes: Ethnobotanical study of Hoti, Panare, and Yabarana Indians.

COURTÉZ, ÁLVARO OMAR
1941–1983; Venez.; Ichthyologist (UCV, Fac. de Ciencias, Caracas).
Feb–Mar 1973: San Fernando de Atabapo, Caño Temi, Río Atacavi, Río Guasacavi, Río Atabapo, Río Orinoco, Río Ventuari up to Canaripó [Caño Guapuchi, right affluent of the lower Río Ventuari]. Approximately 100 nrs. collected, but apparently only few labeled and mounted, deposited at VEN.
Notes: Limnological-ichthyological expedition of CODESUR-UCV, Facultad de Ciencias-Ministerio de Agricultura y Cría (MAC) to white- and black-water rivers.

COURET, PIERRE
1923–1982; French-Venez.; Pharmaceutist, biochemist, orchidologist.
Jul–Oct 1951: Esmeralda–upper Río Orinoco up to the confluence with Río Ugueto.
Notes: Botanist of the French-Venezuelan expedition to the sources of the Río Orinoco; botanical collections apparently made in cooperation with L. Croizat. According to Couret (1966:6), his botanical emphasis was on cryptogams, which he sent to P for study. Grelier (1957:129) cites Couret collecting plants on top of Guaharibo range on 28 Aug 1951.
1958: Expedition to the Río Ventuari, for the Ministerio de Sanidad y Asistencia Social (MSAS) [Ministry of Health].
1970: Expedition to the Río Ocamo.
Notes: No plant collections from these two expeditions were seen by us.
Publications: Couret, 1966; 1982a,b.

COWAN, RICHARD SUMNER
Nrs. 31,352–31,599; NY, VEN.
Nrs. 32,000–32,087; NY, VEN.
Notes: Member of the “New York Botanical Garden’s Exploration Program of the Flora of the Guayana Highland,” during
1950–1951 (see Map 5). Specialist on New World Leguminosae.
Publication: Maguire, 1964a,b.

CROAT, THOMAS
1938–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).
14 Aug 1982: Puerto Ayacucho and surroundings (lower portion of the valley of Río Cataniapo). 
Nrs. 55,037–55,070A; VEN, MO.
Notes: Specialist on neotropical Araceae.

CROIZAT CHALEY, LEÓN
1894–1982; Venez.; Botanist (Instituto Botánico, Caracas).
Jul–Oct 1951; Esmeralda–upper Río Orinoco up to the confluence with Río Ugueto.
Approximately 1200 nrs.; NY, VEN, P?
Notes: Botanist of the French-Venezuelan expedition to the sources of the Río Orinoco. Specialist on Euphorbiaceae, Cactaceae.

CRUXENT, JOSÉ MARÍA
19??– ; Venez.; Archaeologist (Museo de Ciencias Naturales, Caracas).
Nov–Dec 1948: Lower Río Cuao, Río Autana, base of Cerro Autana.
Nrs. 1–75; mainly VEN.
Notes: Participated also in the following expeditions to T. F. Amazonas:
French-Venezuelan expedition to the sources of the Río Orinoco, Jul–Dec 1951;
No plant collections made by Cruxent on these two expeditions have been seen by us.

CURRAN, HUGH M.
1875–1960; U.S.; Forester.
Mar–Apr 1950: Puerto Ayacucho, San Fernando de Atabapo, Santa Bárbara, San Antonio, Culebra [on Río Cunucunu-ma?].
Approximately 300 nrs.? NY? Wood samples at MAD?
Notes: Curran apparently used two different numbering systems during this trip, because some plants bear low numbers (between 50 and 260 approximately), whereas others bear higher numbers (around 1700–1800). We have been unable to trace Curran’s field notes or other pertinent informative sources.

DAVIDSE, GERRIT
1942–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).
Nrs. 2735–2882; MO, VEN.
12–21 Apr 1978: Puerto Ayacucho to Samariapo, Puerto Ayacucho to El Burro (Puerto Nuevo) (with O. Huber).
Nrs. 14,880–15,458; MO, VEN.
24 Apr–10 May 1979: Puerto Ayacucho and surroundings, Río Orinoco, San Fernando de Atabapo, Río Atabapo, Caño Caname, Río Atabapo, Río Orinoco, Santa Bárbara, west base of Cerro Yapacana, Caño Yagua (with O. Huber and S. Tillett).
Nrs. 16,742–16,819, 16,849–17,503; MO, VEN. [16,820–16,848 = Colombian shore of lower Río Atabapo].
Notes: Specialist on neotropical Gramineae.

DELASCI CHITTY, FRANCISCO
1950– ; Venez.; Botanist (Instituto Botánico, Caracas).
Nrs. 9283–9708; VEN, MY, LaSalle (Caracas).
24 Oct–4 Nov 1981: Santa Bárbara del Ori-noco, Macuruco, Canaripó, Las Carmelitas, Caño Yureba up to Salto Yureba, lower Río Ventuari (with F. Guánchêz). Nrs. 10,638–11,051; VEN, MY, Instituto Universitario Pedagógico (Caracas), La-Salle (Caracas), Regional Herbarium at MARNR, Zone 10 (Puerto Ayacucho).

DEZZEO ALDANA, NELDA
1957–; Venez.; Forester (IVIC, San Carlos de Río Negro).
Notes: Resident forester at IVIC study site in San Carlos de Río Negro succeeding H. Clark. Plant collections from the research area, mainly trees of Amazon “caatinga,” “Yévaro” (Eperua) forests on laterite, “Bana” scrub.
Publication: Dezzeo and Buschbacher, in press.

DRESSLER, ROBERT
1927–; U.S.; Botanist (Smithsonian Tropical Research Institute (STRI) Balboa, Panama).
Few nrs., mainly orchids. VEN, STRI?, PMA?

DUNSTERVILLE, GALFRID CLEMENT KEYWORTH
1905–; Brit.; Orchidologist.
14–21 Dec 1951: Río Cuao, up to Raudal Danto and beyond.
6 Dec 1965–6 Jan 1966: Río Cataniapo, Samariapo, San Fernando de Atabapo, Santa Bárbara, Tamatama, Río Matacuni, Río Padamo, Río Cuntinamo, Río Casi-quire down to Caño Caripe (with P. Anduze).
14 Sep–1 Oct 1969: Río Autana [lower course].
8–18 Jan 1975: Río Autana, up to Caño Man-teco.
Notes: Mr. Dunsterville is a specialist on Venezuelan orchids. His collections are almost exclusively orchids. He does not use a sequential numbering system, because his botanical collections are mainly voucher specimens for drawings. Almost all of his several thousand orchid specimens are preserved in spirits and deposited in his private collection in Caracas and partly in VEN. The above mentioned colleagues are not co-collectors, but accompanying persons on particular expeditions. Mr. Dunsterville was accompanied on most of his expeditions by his wife Eleonore.

EDEN, MICHAEL J.
1936–; Brit.; Geographer (Bedford College, Univ. of London).
Apr–May 1968: San Carlos de Río Negro, Brazo Casiquiare, Esmeralda, Río Orinoco, Santa Bárbara, San Fernando de Atabapo, Isla Ratón, Puerto Ayacucho, middle Orinoco.
Approximately 100 nrs.; K.
Notes: Participant of the “Geographical Magazine Amazonas Expedition by Hovercraft” (Manaus to Port of Spain).
Approximately 40 nrs.; VEN.
Notes: Investigation of ecological aspects of indigenous shifting cultivation in the lower Sipapo basin (Piaroa Indians).
Publication: Eden, 1974b.

EWEL, JOHN J.
1941–; U.S.; Plant ecologist (UCV, Fac. de Agronomía, Maracay).
Mar–Apr 1964: Expedition of the Brazilian-Venezuelan Boundary Commission to Cerro de la Neblina:
Nrs.
61–77: Brazil, Mission of Maturacá, 1 Apr 1964.
78–82: Brazil, Río Cauaburi, 9 Apr 1964. [83: eliminated].
84–86: Brazil, Río Tipirico, 12 Apr 1964.
87–98: Brazil, Río Tipirico, 13 Apr 1964.
111–119: Brazil, ascent to Cerro Neblina, 400 m, 18 Apr 1964.
120–131: Brazil, ascent to Cerro Neblina, 1250 m, 21 Apr 1964.
132–143: Brazil, ascent to Cerro Neblina, 1250 m, 23 Apr 1964.
144–148: Cerro Neblina, Venezuelan-Brazilian frontier, 1700 m, 22 Apr 1964.
186–210: Cerro Neblina, Venezuelan-Brazilian frontier, 1500 m, 29 Apr 1964.
211–230: Brazil, Río Cauaburi near mouth into Río Negro, 90 m, Apr 1964.
NY, MY.
Notes: Collections made as part of ecological mapping effort for the “Life Zone Map of Venezuela” (Ewel and Madriz, 1968; Ewel et al., 1976. Field notes in MY. Brazilian collections not mentioned in Prance, 1971.
Publication: Ort, 1965.

FARIÑAS G., MARIO R.
1943–; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).
Nrs. 277–696; VEN, NY, US.
Notes: AsoVAC Expedition to upper Orinoco. Field notes of nrs. 277–526, 530–531 in VEN. First helicopter expedition in T. F. Amazonas.

FERNÁNDEZ, ANTONIO
1928–; Venez.; Agronomist (UCV, Fac. de Agronomía, Maracay).
Nrs. 2847–2990; MY.
15–22 Nov 1978: San Simón de Cocuy, mouth of Río Guainía and San Carlos de Río Negro, mouth of Río Casiquiare, Río Negro, Maroa, Yavita, Río Temi.
Nrs. 3360–3519; MY.

FERRIGNI, NELSON R.
1943–; Venez.; Pharmaceutical researcher (UCV, Fac. de Farmacia, Caracas).
23–26 Mar 1974: Area of San Fernando de Atabapo (with S. Tillett and A. Gentry).
Approximately 59 nrs.; VEN, NY, MYF, HB, K, U.
Publication: Norambuena, 1975.

Field, Andy
1955–; Brit.; Student of ecology (Univ. of Reading, England).
Foldats, Ernesto

1925–; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).
29 Aug–20 Sep 1960: Río Atabapo, Caño Atacavi up to the headwaters.
Nrs. 3526–3887; VEN, NY.
Notes: Joint expedition to blackwater rivers with V. Vareschi and J. Racenis.
Nrs. 57A–210A: Río Ventuari, San Juan de Manapiare, Río Ventuari, 21 Apr–4 May 1971.
VEN, NY.
Notes: Expedition made on behalf of CODESUR for the radar inventory of natural resources in T. F. Amazonas (ground control for vegetation mapping) by Aeroservice Corp. The letter “A” after the number refers to “Amazonas.” Field notes at VEN. Specialist on Venezuelan orchids.
Publication: Aeroservice, 1972 (including maps 1:250,000).
Froes, Ricardo de Lemos

1891–196?; Braz.; Botanist.
11–? Dec 1945: Casiquiare.
Probably few nrs. (less than 100?, e.g., 21,490–21,514: São José do Casiquiare), deposited at IAN, VEN, K, NY, SP, UC, US (fide Prance, 1971).
Notes: Mainly Brazilian collector (with B.A. Krukoff), but made a short trip up the Río Negro into Venezuela, reaching Brazo Casiquiare in December 1945.
Fuentes, Emilio

1952–; Venez.; Anthropologist (Fundación La Salle, Caracas).
31 Mar–30 Nov 1978: Lower and middle Río Ocamo up to Raudal Arata (approximately 700 m), mainly at Guabutagüey-
Gailiard, Albert

1858–1903; French; Botanist, mycologist.
Apr–Sep 1887: Puerto Ayacucho and surroundings, Río Orinoco up to San Fernando de Atabapo, Río Guaviare (Colombia).
Nrs. at least 250.
Notes: The main phanerogamic collections of Gaillard are deposited at P.
Publication: Patouillard and Gaillard, 1888–[1889].
Garofalo, Beatriz

1953–; Venez.; Botanist (Instituto Botánico, Caracas).
Nrs. 127–157; VEN.
Nrs. 475, 477–480; VEN.
Gehriger, Wilhelm
?
Nov 1929–Feb 1930: Río Orinoco, Puerto Ayacucho, Brazo Casiquiare, Río Negro, Cucuhy (Brazil) (with E. G. Holt).
Gentry, Alwyn

1945–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).
23–26 Mar 1974: San Fernando de Atabapo and surroundings (with S. Tillett and N. Ferrigni).
Nrs. 10,825–10,937; MO, VEN.
Nrs. 14,408–14,644; MO, VEN.
Notes: Specialist on New World Bignoniaceae.
Geographical Magazine Amazonas Expedition by Hovercraft
[11 Apr 1968: Start in Manaus, Brazil].
16 Apr 1968: Cucuí to San Carlos de Río Negro.
17 Apr 1968: Solano.
19–28 Apr 1968: Region of Esmeralda (Río Pecos, Río Padamo, Brazo Casiquiare).
28 Apr 1968: Esmeralda to Santa Bárbara.
28 Apr–2 May 1968: Region of Santa Bárbara (Río Ventuari, up to Las Carmelitas; Santa Bárbara and vicinity).
2 May 1968: Santa Bárbara to San Fernando de Atabapo.
3 May 1968: San Fernando de Atabapo to Puerto Ayacucho.
6 May 1968: Puerto Ayacucho to Puerto Carreño (Colombia).
[7–9 May 1968: Puerto Carreño, Ciudad Bolívar, Puerto Ordáz, Port of Spain, Trinidad].
Scientific personnel of the expedition:
MICHAEL J. EDEN, geographer, leader of the scientific party.
CONRAD GORINSKY, ethnobotanist.
DAVID HARRIS, geographer, ethnographer.
John B. Thornes, geographer, hydrologist.
ERNESTO MEDINA, plant ecologist.

Notes: All except Thornes collected plants during the expedition.

Publications on the expedition: Botting, 1968a,b; Eden, 1968; Branston, 1970; Medina, 1971.


GORINSKY, CONRAD
1936– ; Brit.; Ethnobotanist (St. Bartholomew's Hospital, London).
Apr–May 1968: San Carlos de Río Negro, Brazo Casiquiare, Esmeralda, Ocamo, Puerto Ayacucho.
Approximately 10 nrs., deposited at St. Bartholomew's Medical College, London.
Notes: Participant of the “Geographical Magazine Amazonas Expedition by Hovercraft.”

Publication: Gorinsky, 1969.

Griot Casanova, Marcel
19??– ; ? ; Pilot of aircraft of P. Redmond.
22 Feb 1979: Yutajé, Caño Coro-coro (with J.A. STEYERMARK and P. Redmond).

GRUBB, PETER
19??– ; Brit.; Plant ecologist (Univ. of Cambridge, School of Botany, Cambridge, Great Britain).

GUÁNCHEZ MEZA, FRANCISCO
1953– ; Venez.; Agronomist, botanist (MARNR, Zone 10, Puerto Ayacucho).
11 Apr 1980–present: Intermittent collections in and around Puerto Ayacucho and vicinity.
9–15 May 1980: Valley of Río Cataniapo (Gavilán, San Pedro); vicinity of Puerto Ayacucho (with J.A. STEYERMARK and G. Davide).
13–28 Feb 1981: Ocamo, upper Río Orinoco, Río Mavaca, Sierra de Unturán, Río Matacuni (by helicopter).
Nrs. 462–899.
Nrs. 1027–1301.
Nrs. 1310–1424.
Nrs. 1498A–1769 [nrs. 1498–1598 have been erroneously used twice; therefore, one set has been differentiated by the addition of the letter A to the duplicated nrs.].
Nrs. 1837–1937 [mainly secondary vegetation and cultivated plants around all settlements along Río Orinoco; general collections of riverine vegetation].
3–16 Nov 1982: Ocamo (Santa María de los
Guáicas) and vicinity; headwaters of Río Padamo; 15 km south of Tamatama; Raudal Guaharibo; southern end of Sierra Parima, west of Río Ejército; Raudal Peñascal; south base of Cerro Duida, 360 m; Ocamo; Río Arari, 2–5 km south of confluence with Río Matapire; Cerro Duida, north ridges, Caño Negro, 750 m (by helicopter).

Nrs. 1950–2353. All collections: Regional Herbarium of MARNR at Puerto Ayacucho, VEN, MY.

Notes: Resident botanist of MARNR at Puerto Ayacucho since 1979. Founder and curator of the Regional Herbarium of MARNR in Puerto Ayacucho.

Guariglia P., Mario
1954–; Venez.; Botanist, mycologist (Instituto Botánico, Caracas).


Nrs.: 1–524; VEN, NY (mainly fungi).


Nrs.: 1376–1796; VEN, NY (bryophytes, fungi, and lichens).

Notes: Helicopter expedition conducted by C. Brewer-Carías.

Publication: Guariglia and Iturriaga, 1980.

Guinand, Luisa Elena
1956–; Venez.; Botany student (UCV, Fac. de Ciencias, Caracas).


Nrs. 1–117; VEN.


Gutiérrez, Luis V.
1938–; Venez.; Chemical technician (UCV, Fac. de Farmacia, Caracas).

27 May–3 Jun 1974: Surroundings of San Fernando de Atabapo, surroundings of Santa Bárbara del Orinoco (with S. Tillet).

Hall, Jerry
194–; U.S.; Zoologist (Univ. of Georgia, Athens, U.S.A.).


Approximately 30 nrs.; VEN, NY?

Harris, David R.
1930–; Brit.; Ethnographer (University College, London).

16 Apr–6 May 1968: Río Casiquiare, Río Orinoco, Río Ocamo, Río Ventuari (Las Carmelitas), Isla Ratón.

Few nrs.; K.

Notes: Member of the “Geographical Magazine Amazonas Expedition by Hovercraft.” Collected mainly cultivated plants used by Indians in their “conucos” (migrating cultivation plots).


Hasegawa, Masahisa
1938–; Japan.; Chemist (UCV, Fac. de Ciencias, Caracas).

11–19 Feb 1974: Surroundings of San Fernando de Atabapo (with S. Tillett).

1–9 Feb 1977: San Carlos de Río Negro and vicinity (with G. Morillo).

Heny, Gustavo
19??–; Venez.


Hermosó, Freddy
1948–; Venez.; Soil scientist (MARNR, Caracas).

Mar 1977: Region of Santa Bárbara del Orinoco (with D. Dubroeucq).

1 nr. [s.n.]; VEN.

4 Nov 1978: Cerro Aracapo (upper Río Guayapo).

Few nrs. [s.n.]; VEN.

Hernández Ramos, Juan Francisco
1958–; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).

Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay (see also Ruiz Zapata, Thirza).

HERRICK, L.B.

? ; ? ; ?


A few orchid collections at VEN [s.n., s.d.].

Notes: Occasional visitor of the Venezuelan Frontier Commission in May 1972, during J.A. Steyermark’s journey in the Sierra Parima (Steyermark, pers. comm.).

Hitchcock, Charles Baker


Notes: First visit to T. F. Amazonas in 1928–1929 as a member of the Tyler-Duida Expedition to Cerro Duida (see Tate and Hitchcock, 1930).


Holmgren, Noel


HOLT, ERNEST GOLSAN


Nov 1929–Feb 1930: Ciudad Bolivar to Cucuhy (Brazil) (with W. Gehriger).

Botanical collections in T. F. Amazonas:

Nrs. 210–217: Puerto Sanariapo, 12 Jan 1930.

218–227: Mouth of Río Vichada, 13 Jan 1930.

228–229: Mariposa, Río Orinoco (Colombia), 14 Jan 1930.


242–245: Santa Bárbara, 18 Jan 1930.


336–340a: San Felipe (Colombia), 29 Jan 1930.

341–399: Cucuhy (Brazil), 4–5 Feb 1930.

400–413: Puerto Ayacucho, 25 Feb 1930.

Notes: National Geographic Society Venezuela-Brazil expeditions. Some of the labels of these collections bear “N.G.S.” as collectors. First set at US; dupl. NY, VEN, B, BM, G, GH, S, CM.


Botanical collections in T. F. Amazonas:

14–26 Nov 1930: Salto Huá, Río Maturacá (Venezuelan-Brazilian frontier).


30 Jan–22 Feb 1931: Río Casiquiare.

23 Feb 1931: Río Orinoco, Tamatama.

24 Feb 1931: Río Orinoco, near Cerro Cariche.

25 Feb 1931: Río Orinoco, Isla Temblador.


12–16 Mar 1931: Río Orinoco, Isla Corocoro.
17–23 Mar 1931: Cerro Yapacana, base camp.
23 Mar–29 Apr 1931: Cerro Yapacana.
8–23 May 1931: Puerto Ayacucho.

Notes: The above itinerary and dates are taken from Friedmann’s paper on the ornithological results of Holt’s expedition. Bird-collecting sites do not necessarily always correspond to plant-collecting localities. Apparently, Holt and companions were the first naturalists to ascend to the top of Cerro Yapacana (approximately 1200 m). Nevertheless, so far no collections made by Holt have been seen by us from the summit region of that mountain. Possibly, plant collections were made only at the base of Cerro Yapacana. A total of 452 collections of the original set collected by Holt and Blake are deposited at US; duplicates at VEN, NY (and other herbaria as above?). The Venezuelan Amazonas collections made by Holt and Blake cover approximately their nrs. 600–800. Holt and Blake’s plant collections made in Brazil are omitted in France, 1971.


HOYOS F., JESÚS
1927– ; Venez.; Botanist (Sociedad de Ciencias Naturales La Salle, Caracas).
5–20 May 1973: Caño Asisa, Cerro Parú (La Momia), Laguna Asisa (with G. Morillo).
Nrs. 1–133; La Salle (Caracas), VEN.
Notes: Joint helicopter expedition of Sociedad de Ciencias Naturales La Salle and Instituto Botánico (VEN), Caracas.


HUBER, OTTO (Map 3)
1944– ; Ital.; Botanist, ecologist (CODESUR, MARNR, Caracas).
25 Jan–20 Apr 1977:
17 Jun 1977–13 Apr 1978:
Nrs.
1388–1417: Puerto Ayacucho and vicinity (with L. Cárdenas de Guevara and M. Pyykkö), 9–10 Jan 1978.
1733–1750: Puerto Ayacucho and vicinity (with G. Davidse), 12–13 Apr 1978.
25 May 1978–17 Jul 1982:
Nrs.


5755–6126: ["Heli-trip 7"] Lower Río Siapa, Río Pacimoni, Cerro Aracamuni, Caño Pimichín, Río Guasacavi, Sierra Parima, middle Río Siapa, Serranía Vinilla, lower Río Yatúa, San Carlos de Río Negro, Serranía Cariche, lower Caño Maraúta, 6–18 Feb 1981 (partly with E. Medina).


6128–6241: ["Heli-trip 8"] Sierra Parima, Cerro Duida (south base), Río Ocamo, Serranía Vinilla, Río Asisa, Río Yagua, Río Sipapo, 12–16 Jun 1981.
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14 Dec 1982: Puerto Ayacucho and vicinity (with F. Guanchez).
First set of all collections: VEN; dupl. NY, US, U.


Publications: Huber, 1980, 1982a,b, in press; Fölster and Huber, in press.

HUMBOLDT, FRIEDRICH HEINRICH ALEXANDER VON (Map 4)
1769–1859; Germ.; Naturalist, geographer, botanist, zoologist.
Travelled in Territorio Federal Amazonas (with A. Bonpland).
13 Apr 1800: Entering T. F. Amazonas on Río Orinoco through Raudal de Tabaje, south of confluence of Río Meta with Río Ori- noco.
14 Apr 1800: Isla Guachaco [or Vachaco], mouth of Río Paruenei [Parhüeña?], Isla Panumaná.
15 Apr 1800: Mouth of Río Anaveni, Atures [San Juan Nepomuceno de los Atures].
17 Apr 1800: Mouth of Río Cataniapo, Raudal Garcia, Isla Tomo [Colombia].
18 Apr 1800: Mouth of Río Tomo, Raudal de los Guahibos, Puerto de Maipures, San José de Maipures [Colombia].
19–20 Apr 1800: Maipures [Colombia].
21 Apr 1800: Puerto de Maipures, Raudal de Camejí, Isla Piedra Ratón.
22 Apr 1800: Mouth of Río Sipapo, mouth of Río Vichada [Colombia], Caño Piriyavi, mouth of Río Zama [Colombia].
23 Apr 1800: Mouth of Río Mataveni, El Castillo, mouth of Río Sincurivapo, Peñón de Aricagua.
24 Apr 1800: Mouths of Ríos Ucata, Arapa and Caranaveni, Siquita, Guaviare, San Fernando de Atabapo.
25 Apr 1800: San Fernando de Atabapo.
26 Apr 1800: Guapasoso.
27 Apr 1800: Mouth of Río Ipurichapano, Piedra del Tigre.
28 Apr 1800: Piedra and Raudalito de Guar- inuma, Mendaxari.
29 Apr 1800: San Baltasar.
30 Apr 1800: Mouth of Río Atacavi, mouth of Río Guasacavi, Río Temi, Piedra de Astor.
1 May 1800: Confluence of Río Temi and Río Tuamini, San Antonio de Javita [Yavita].
2–4 May 1800: Javita.
5 May 1800: Javita, Puerto de Pimichín.
6 May 1800: Caño Pimichín, Río Negro [= Río Guainia], Maroa, mouth of Río Aquío, mouth of Río Tomo, San Miguel de Dav- ipe, Río Conorichite or Itinivini [= Caño San Miguel], Isla Dapa.
7 May 1800: Mouth of Casiquiare, San Carlos de Río Negro.
8–9 May 1800: San Carlos de Río Negro.
10 May 1800: Río Negro, Isla Zaruma and Mini, Raudales de la Piedra de Uinumane, mouth of Casiquiare, Isla de Garigave, San Francisco Solano.
11 May 1800: Caño Daquiapo, Caño Guachap-
MAP 4.—Exploration by Humboldt and Bonpland, 1800 (number/roman numeral = day/month).
uru, Raudales de Cunanivicari, Piedras Guanari, Piedra Culimacari.
12 May 1800: Mouth of Río Pacimoni, Misión de Mandavaca [Quirabuena].
13 May 1800: Mouth of Río Idapa [Siapa], Raudal del Cunuri.
22 May 1800: Esmeralda, mouth of Río Guapo [= Iguapo].
24–25 May 1800: Río Orinoco, mouth of Río Cunucunuma, mouth of Río Guanami, mouth of Río Puruname, mouth of Río Jao [Yagua], Santa Bárbara.
26 May 1800: Santa Bárbara, Isla de Minisí [Mínicio].
27 May 1800: Mouths of Ríos Quejanuma, Ubua and Masao, San Fernando de Atabapo.
28 May 1800: San Fernando de Atabapo, El Castillito, mouth of Río Metaveni [Colombia].
29 May 1800: Mouth of Matavení, Raudal de Maipures.
30 May 1800: Misión de Maipures [Colombia].
31 May 1800: Rápidos de los Guahibos, Raudal Garcita, Puerto de la Expedición, Caverna de Atarupe, Misión de Atures.
1 Jun 1800: Raudalito de Canucari, Isla Panumaná.
2 Jun 1800: Playa de Guachaco, Misión San Borja, mouth of Río Meta, Carichana [Edo. Bolívar].
Notes: Presumably, Humboldt and Bonpland collected approximately 500 numbers of plants during their travel in T. F. Amazonas. The first set is deposited at P; dupl. at B, KIEL, HAL, L, LINN, MEDEL, PC, W.
Publications: Humboldt, 1816–1831; 1818–1829; Sandwith, 1925; Dugand, 1956; Stearn, 1968.

Instituto Nacional de Parques (INPARQUES)
Autonomous governmental institution annexed to the Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), with the function of management and protection of the national parks throughout Venezuela.
Since January 1981, the Instituto Botánico, including the Herbario Nacional de Venezuela (VEN), has been placed under INPARQUES in the Dirección de Investigaciones Biológicas.
Personnel of the Instituto Botánico, INPARQUES, who have made botanical collections in Territorio Federal Amazonas: Francisco Delascio C., Beatríz Garofalo, Mario Guariglia, Luisa Elena Guinand, Gilberto Morillo, Julian A. Steyermark.

National Parks and Natural Monuments in T. F. Amazonas:
Parque Nacional “Yapacana,” Departamento Atabapo, 320,000 ha.
Parque Nacional “Duida-Marahuaca,” Departamento Atabapo, approximately 210,000 ha.
Parque Nacional “Serranía La Neblina,” Departamento Río Negro, approximately 1,360,000 ha.
Monumento Natural “Piedra El Cocuy,” Departamento Río Negro.
Monumento Natural “Cerro Autana,” Departamento Atures.

Instituto Venezolano de Investigaciones Científicas (IVIC)
1974–1982: Long-term ecological research on the composition and functioning of Amazon forest ecosystems (“Tierra firme” forests, “Caatinga” forests, “bana” scrub) in the vicinity of San Carlos de Río Negro, along road to Solano.
Interinstitutional and multidisciplinary research as part of UNESCO-Man and
Biosphere (MAB) Program on Tropical Forests.
Directors: Dr. Ernesto Medina, Dr. Rafael Herrera (IVIC).
Institutions involved:
IVIC (Caracas, Venezuela).
Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT (Caracas, Venezuela).
University of Georgia, Institute of Ecology (Athens, Georgia, U.S.A.).
National Science Foundation, NSF (Washington, D.C., U.S.A.).

Scientists involved with plant collecting at the IVIC study sites near San Carlos de Rio Negro: Eberhard F. Brunig, Robert Buschbacher, Howard L. Clark, Nelda Dezzeo, Kathleen Ennis Clark, Jerry Hall, Hans Klinge, Ernesto Medina, Christopher Uhl.

Ishikawa, Motosuke
19??- ; Japan.; Ethnobotanist.

Iturriaga C., Teresa María
1955- ; Venez.; Biology study (UCV, Fac. de Ciencias, Caracas).
Publication: Guariglia and Iturriaga, 1980.

Jaffée, Werner
1914- ; Venez.; Biochemist (UCV, Fac. de Ciencias, Caracas).
5–21 Aug 1964: Puerto Ayacucho, Río Atabapo, Río Orinoco, Río Cunucunuma, Río Ocamo (with V. Vareschi).

Jahn, Alfredo
1867–1940; Venez.; Naturalist, geologist.
Oct 1887: Upper Río Orinoco, Atures, San Fernando de Atabapo (trip interrupted at San Fernando de Atabapo due to illness).
Notes: According to Arnal (1943), Jahn made his first plant collections on this expedition, which was conducted by the Venezuelan ethnologist and agronomist Vicente Marcano. His collections were studied by Adolfo Ernst and the results published in a short paper (Ernst, 1888). Jahn was actually the first Venezuelan naturalist collecting plants in T. F. Amazonas.

Publications: Ernst, 1888; Jahn, 1909a,b.

Jangoux, Jacques Ivan G.
1938- ; Belg.; Anthropologist, photographer, botanist.
Aug? 1973: Mountains around Caño Iguana [right affluent of Río Asita, upper Ventuari basin], 1800 m.
Few nrs.; MYF.
Notes: Collected Arthrostylidium schomburgii (Bennett) Munro during this trip, which was primarily devoted to the study of the life of Hoti Indians.
9–23 Apr 1974: San Juan de Manapiare, Cerro Calentura [= Cerro Ualipano, headwaters of Río Parucito; by helicopter], Hato Yavi [lower Río Parucito], Caño Majagua [left affluent of lower Río Parucito].
Nrs. 10,001–10,159?: VEN, NY?.
Notes: Aim of the expedition: nature photography documented by botanical voucher specimens.

Jiménez, Hernan
195?- ; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).

Jordan
This name cited by Prance (1972, Flora Neotropical, volume 9, page 127) as collector of Licania hypoleuca var. hypoleuca ["AMAZONAS: Jordan s.n., VEN—Nr. 87,090"] refers actually to a collection of Foldats, s.n.[?], from Santa Cruz, Río Atabapo, Sep 1960.
Keith, William M., Jr.

King, Martin M.
19??– ; U.S.;
20 Jun 1977: San Juan de Manapiare, Yutajé (with J.A. Steyermark and P. Redmond).

Klinge, Hans
Occasional collections with E. Medina; VEN.

LASI, MARGIE
26 Oct 1982: Río Autana.
Nrs. 001–006; VEN.

LASSER, TOBIÁS
1911– ; Venez.; Botanist (Instituto Botánico, Caracas).
Dec 1958: Upper Ventuari (with Dryer).
1 specimen at VEN (Dicranopygium bolivarensense Harl., Lasser & Dryer 4311, 19 Dec 1958) [doubtful locality].

LEOPOLD III, KING OF BELGIUM
1901–1983; Belg.; Explorer.
10 May–9 Jun 1952: Expedition to upper Orinoco, Río Negro, and Río Autana [Expedition “Elata”].
Itinerary:
10–11 May 1952: Caracas to Puerto Ayacucho to Esmeralda [by airplane].
12 May 1952: Esmeralda.
13–14 May 1952: Esmeralda to Platanal.
15 May 1952: Platanal to Majekodo, and return to Platanal.
16 May 1952: Platanal, Esmeralda, mouth of Río Cunucunuma.
17 May 1952: Río Cunucunuma, Jakaré [Raudal Picare].
18 May 1952: Jakaré, mouth of Río Cunucunuma.
19 May 1952: Mouth of Río Cunucunuma to mouth of Río Casiquiare.
20 May 1952: Mouth of Casiquiare, Capibara.
21–22 May 1952: Capibara, San Carlos de Río Negro.
22 May 1952: San Carlos de Río Negro, San Felipe [Colombia], Santa Rosa de Amanadona.
23–25 May 1952: Santa Rosa de Amanadona, El Carmen, Piedra del Cucuy [ascent], San Carlos de Río Negro.
29 May 1952: San Carlos de Río Negro, Río Guainia.
30 May–1 Jun 1952: Río Guainia, Caño Pimichín, Yavita.
2 Jun 1952: Yavita, San Fernando de Atabapo, Amanaven, El Castillito [Río Orinoco].
5 Jun 1952: Río Autana, Raudal Pereza.
6 Jun 1952: Caño Umaj-Aje (affluent of Río Autana).
7 Jun 1952: Río Autana, lower Río Cuao.
8–9 Jun 1952: Río Autana, Puerto Ayacucho.
Nrs. coll.?: BR?
Publication: Anonymous, s.d. [1956?] [photograph no. 68 showing botanical collecting along Río Autana].

LEVEL YANABE, JOSÉ SILVERIO
1929– ; Venez.; Expedition guide.
19 Apr–12 Sep 1954: Upper Orinoco, region of San Fernando de Atabapo.
155 nrs.; NY, VEN.
Notes: Resident of San Fernando de Atabapo and, recently, Puerto Ayacucho; guide on most of B. Maguire’s expeditions in T. F. Amazonas; has made occasional botanical collections for B. Maguire (NY). Some of the numbers are preceded by “L-.”

LICHY, ÉVELINE
19??– ; French;
Approximately 25–30 nrs.; VEN, P?

LIESNER, RONALD
1944–; U.S.; Botanist (Missouri Botanical Garden, St. Louis).
Nrs. 3275–4200.
3 Apr–12 May 1979: San Carlos de Río Negro and surroundings (IVIC study sites).
Nrs. 6066–7397.
Nrs. 8462–9143.
Nrs. 10,955–10,995.
All collections VEN, MO; dupl. at NY.
Publication: Clark and Liesner, in prep.

LISTER, JOHN R.A.
1954–; Brit.; Ethnobotanist.
Sep 1975–Aug 1976: Río Ventuari upstream from Las Carmelitas, middle and upper Río Ventuari basin, Río Manapiare basin (with M.E.M. Colchester).
Nrs. 1–750 approximately, Lister & Colchester.
Nrs. 2001–2700 approximately, Colchester & Lister.
MYF, K, VEN, St. Bartholomew’s Medical College, London.
Notes: “Proyecto Ventuari,” supported by CO-DESUR and UCV. Ethnobotanical research on Guahibo, Hohontu, Hoti, Makiritari, Piaroa, Sanemá, and Yavarani Indians.
Publication: Colchester and Lister, ms.

LUETZELBURG, PHILIPP VON
1880–1948; Germ.; Botanist, explorer.
Nrs. ?; M, R. NY, F.
Notes: According to Prance (1971), Luetzelburg was a mainly Brazilian collector with the “Comissão Rondon, Inspeção de Fronteiras do Brasil.” According to Pittier et al. (1945–1947), Luetzelburg collected several new palm species on this trip, described by Burret in 1930; the collection numbers cited in Pittier for these palms range between 22,297 (from Esmeralda) and 23,150 (from Solano); accordingly, Luetzelburg would have collected more than 850 nrs. on a short trip into Venezuela of only 5 days, which appears somewhat improbable. Evidently, Luetzelburg’s numerical sequence is irregular and does not conform to his itinerary nor sequence of dates in Venezuela.

Luteyn, James
27 Jan–11 Feb 1982: Culebra, Río Cunucunuma, Cerro Marahuaca, Cerro Duida, Cerro Huachamacari (with J.A. STEYERMARK, M. Guariglia, N. Holmgren, and S.
Mori).
Notes: Specialist in neotropical Ericaceae.

MAAS, PAUL JOHANNES MARIA
1939- ; Dutch; Botanist (Univ. of Utrecht, Inst. of Systematic Botany).
Nrs. 5079–5164; VEN, U.
Nrs. 5165–5180; VEN, U.
Notes: Specialist in neotropical Burmanniaceae, Gentianaceae, Zingiberaceae, and Cannaceae.

MÄGDEFRAU, KARL
6 Jan–14 Feb 1958: Upper Orinoco, Esmeralda, Río Ocamo, Casiquiare, Río Negro, Río Guainia, Caño Pimichín, Yavita, Río Atabapo, Río Orinoco (phanerograms with V. VARESHI).
Nrs. 113–298; M, VEN, private herbarium K. Mägdefrau.
Notes: Member of the “Humboldt-Gedächtnis-Expedition” [Humboldt Memorial Expedition]; own collections refer mainly to cryptograms (mosses, hepatics, and lichens).

MAGUIRE, BASSETT (Map 5)
Nrs. 27,305–29,039.
18 Apr–21 May 1949: Cerro Duida, Cerro Marahuaca [lower slopes] (with B. Maguire, Jr.).
Nrs. 29,040–29,221.
Nrs. 29,222–29,345.
Nrs. 29,346–31,351.
Nrs. 31,600–31,789.
Nrs. 31,790–831.
4 Mar 1951: Puerto Ayacucho and vicinity.
Nrs. 31,832–31,836.
27 Jan–9 Mar 1953: Cerro Yutajé (with C. Maguire).
Nrs. 35,000–35,539.
15 Mar–24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro down to Piedra Cocui, Río Guainia (with J.J. Wurdack and C. Maguire).
Nrs. 34,478–34,999, 35,540–35,736.
7 Nov 1953–18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainia, Río Pacimoni, Río Yatua, Cerro Neblina (with J.J. Wurdack and G.S. Bunting).
Nrs. 36,031–37,714.
11 Sep–16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainia, Río Casiquiare, Río Pacimoni (with J.J. Wurdack, C. Maguire, and W.M. Keith, Jr.).
Nrs. 41,428–41,923.
Nrs. 41,924–42,655.
Nrs. 60,052–61,001.
All collections: NY, VEN; dupl. at US, MO, F, U, K, BM and others.

Notes: Head of the largest botanical collecting program in T. F. Amazonas (“New York Botanical Garden’s Exploration Program of the Flora of the Guayana Highland”), during which approximately 11,800 nrs. were collected from this region. The dates cited here for each expedition were furnished by B. Maguire in 1982 and differ slightly in some cases from those given in Maguire, 1954. More extensive data will be published later by Maguire.


Maguire, Bassett, Jr.
19??– ; U.S.; Biologist.
18 Apr–21 May 1949: Cerro Duida and Cerro Marahuaca (with B. MAGUIRE).

Maguire, Celia K.
27 Jan–9 Mar 1953: Cerro Yutajé (with B. MAGUIRE).
15 Mar–24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro down to Piedra Cocui, and Río Guainía (with B. MAGUIRE and J.J. Wurdack).
11 Sep–16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with B. MAGUIRE, J.J. Wurdack, and W.M. Keith, Jr.).

MANARA, BRUNO
1939– ; Venez.; Botanical artist (Instituto Botánico, Caracas).

From about nrs. 140–200; VEN.

MARCANO-BERTI, LUIS
1940– ; Venez.; Forestry botanist (ULA, Fac. de Ciencias Forestales, Mérida).
Nrs. 1–12/76—28–12/76; MER, VEN.
Nrs.
61–76/979: Road San Carlos–Solano (12 Mar).
77–96/979: Road San Carlos–Solano (13 Mar).
110–133/979: San Carlos and vicinity (15 Mar).
146–149/979: San Carlos and vicinity (forest) (16 Mar).
150/979: San Felipe [Colombia] (16 Mar). MER.

Notes: Specialist in Venezuelan Vochysiaceae; Marcano-Berti uses a compound numbering system referring to the date (month and/or year) of collection.

MATOS, FELIPE
1933– ; Venez.; Botanist (Sociedad de Ciencias Naturales La Salle, Caracas).
27 Mar–7 Apr 1958: San Juan de Manapiare and vicinity, Cerro Morrocoy (with Hno. Antonio).
168 nrs.; La Salle, Caracas, US.
Notes: “Expedición de la Sociedad de Ciencias Naturales La Salle al Territorio Amazonas.”
Publication: Jam Lander, 1958.

MEDINA, ERNESTO
1938– ; Venez.; Plant ecophysiologist (UCV, Fac. de Ciencias, Caracas; since 1970 IVIC-Centro de Ecología, Caracas).
16 Apr–6 May 1968: Río Negro, Brazo Casiquiare, Esmeralda, Río Orinoco, Santa Bárbara, San Fernando de Atabapo, Isla Ratón, Puerto Ayacucho.
Nrs. 247–512; VEN.
Notes: Member of the "Geographical Magazine Amazonas Expedition by Hovercraft."

Notes: Leader of the "Expedición Científica AsoVAC al Alto Orinoco."

Feb 1971: Río Atabapo, from San Fernando up to Guarinuma.
Approximately 50 nrs.; VEN.

Sep 1973–1982: San Carlos de Río Negro and vicinity (IVIC study sites; some collections with H. Klinge).
? nrs.; VEN [approximately 100–200 nrs.?].

6–11 Feb 1981: Río Siapa, Río Pacimoni, Cerro Aracamuni, Caño Pimichín (with O. HUBER).
Notes: The botanical collections of E. Medina after 1971 do not have numbers (only s/n = sin número), his field notebooks having been lost during a shipwreck in Lake Maracaibo.


Mercado, Leyda
1957–; Venez.; Agronomist (MARNR, Zone 10, Puerto Ayacucho).

Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) [Ministry of Environment and Renewable Natural Resources]
Created 1 Apr 1977, as one of the main institutions replacing the former Ministerio de Obras Públicas (MOP), with two organizational structures:
Central organization with four General Directions (in Caracas):
Dirección General de Información e Investigación del Ambiente (DGIIA) [to which CODESUR was annexed from 1977–1979].
Dirección General de Planificación y Ordenación del Ambiente (DGPOA).
Dirección General de Infraestructura (DGI).
Dirección General de Administración del Ambiente (DGAA).
Regional organization with 14 regional offices ("Zonas administrativas"). Territorio Federal Amazonas is administered by the "Zona 10" in Puerto Ayacucho.
Ministerio de Obras Públicas (MOP) [Ministry of Public Works]
Governmental institution to which the Comisión para el Desarrollo del Sur de Venezuela (CODESUR), q.v., has been attached since its creation 3 Jul 1969.
The Ministerio de Obras Públicas was transformed into three new ministries on 1 Apr 1977:
Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR), q.v.
Ministerio de Transporte y Comunicaciones (MTC)
Ministerio de Desarrollo Urbano (MIN-DUR).
Molina Araque, Jorge see Araque Molina, Jorge
Molina, Ramón
1957–; Venez.; Forestry technician (MARNR, Zone 10, Puerto Ayacucho).
51 irregularly numbered nrs.; MER, VEN, Regional Herbarium of MARNR at Puerto Ayacucho.
Notes: Voucher specimens of wood collections for studies on physical-mechanical properties.

Monachino, Joseph Vincent
Dec 1955: Middle Orinoco north of Puerto Ayacucho (with J.J. Wurdack).
Notes: Specialist on Apocynaceae of the New World.

Mondolfini, Edgardo
1918–; Venez.; Zoologist (UCV, Fac. de Ciencias, Caracas).
May 1975: Caño Platanal [Platanal Mission], upper Orinoco.
3 nrs.; VEN.

Monod, Jean
1937–; French; Ethnographer.
Nrs. 1–103, 165–169; MYF, P.
Notes: Ethnobotanical research with Piaroa Indians. Nrs. 104–164 were not used.

Morales M., Antonio
1940–; Venez.; Chemist (ULA, Fac. de Farmacia, Mérida).

Mori, Scott
Notes: Specialist on neotropical Lecythidaceae.

Morillo, Gilberto
1944–; Venez.; Botanist (Instituto Botánico, Caracas).
5–9 May 1973: Puerto Ayacucho, Laguna Asisa (Cerro Asisa o Parú), San Juan de Manapiare (with Jesús Hoyos).
Nrs. 3156–3195; VEN.

22–29 Sep 1973: Puerto Ayacucho, Sanariapo, mouth of Río Cuao, Río Sipapo near mouth of Río Cuao, mouth of Río Guayapo, 14–16 km above mouth of Río Guayapo, 2–3 km up Río Cuao, Isla Ratón, Puerto Ayacucho, Cerro Zamuro and Cerro Coromoto 35 km southeast of Puerto Ayacucho, Raudal de Atures, mouth of Río Cataniapo (with M. Ishikawa).
Nrs. 3406–3663; VEN.

23–30 Apr 1974: San Carlos de Río Negro and vicinity, road to Solano, Río Casiquiare between Chapaqón and Guirape west of Solano; between Isla Paleta and Caño of the “división” west and south of Santa Lucía [near the Colombia-Venezuela-Brazil frontier], vicinity of San Simón de Cocuy, Puerto Ayacucho (with B. de Morillo and C. Wood).
Nrs. 3884–4224; VEN.

1–9 Feb 1977: San Carlos de Río Negro and vicinity, road to Solano, Río Guainía from Raudal del Lombriz to Brazo Casiquiare, Isla Chamanare on Río Casiquiare (some collections with N. Villa and with M. Hasegawa).
Nrs. 4987–5585; VEN.

16–26 Nov 1977: Puerto Ayacucho and surroundings (Gavilán, Caño Carinagua), Puerto Venado [south of Samariapo]; Río Sipapo (Márida, Laja Terecay, Laja de Tonina, Laja de Garza, Caño Vacá, Pica de levantamiento forestal # 3 to 10 km south of Laja de Garza, Pica de levantamiento forestal # 4 to 6 km north of Laja de Garza, Laja Rana), Río Orinoco between Isla Ratón and Puerto Venado (with A. Trujillo).
Nrs. 6632–7106; VEN.

Notes: Botanical collections made as part of a Forest Inventory sponsored by MARNR-CODESUR in the “Reserva Forestal del Sipapo” under the direction of A. Catalán.

Apr 1978: Río Orinoco, San Fernando de Atabapo, Patacame, Santa Bárbara del Orinoco (with N. Suárez and J. Camico).
Approximately 200 ? nrs.; VEN.
Notes: Botanical collections made as part of a study on secondary vegetation in "conucos" and other cultivated areas in T. F. Amazonas, conducted by N. Suárez (CODESUR); notebooks of this trip have been lost. G. Morillo is a specialist in Venezuelan Asclepiadaceae and Apocynaceae.

Morillo, Beatriz de
19??– ; Venez.; wife of G. Morillo.
23–30 Apr 1974: San Carlos de Río Negro and vicinity (with G. MORILLO and C. Wood).

Narbaiza, Íñigo
19??– ; Venez.; Photographer (UCV, Fac. de Ciencias, Caracas).
22–26 Feb 1982; Puerto Ayacucho and vicinity (with R. ORTÍZ).

Ortiz Q., Rafael E.
1957– ; Venez.; Botany student (UCV, Fac. de Ciencias, Caracas).
22–26 Feb 1982; Puerto Ayacucho and vicinity, between Gavilán and Las Pavas (with I. Narbaiza).
Nrs. 16–44; VEN.

Pannier, Federico
1934– ; Venez.; Botanist, plant ecologist (UCV, Fac. de Ciencias, Caracas).
Itinerary:
Nrs.
1037a: San Fernando de Atabapo, 6 Jul 1958.
1038–1040: Trapichote, 7 Jul 1958.
1041–1051, 1061: Santa Bárbara, 8 Jul 1958.
1070–1075: Guanami, 10 Jul 1958.
1166–1175: Misión Coromoto, 22 Jul 1958. VEN.
Notes: Collection of plants for pharmaceutical research at the chemical factory of Dr. Willmar Schwabe in Karlsruhe, Fed. Rep. of Germany.
Dr. Pannier made a film (8 mm) of the expedition. Total duration of the expedition: 20 Jun 1958 (Caicara), 14 Jul 1958 (Ocamo), 28 Jul 1958 (Caicara); total nrs. collected: Nrs. 839–1189.

Parra Rondón, Romelia
1949– ; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).
Nrs. 1–21; MY.
Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay (see also T. Ruiz Zapata).

Phelps, Kathleen Deery de
1908– ; Venez.; Explorer, artist.
Feb 1946: Cerro Paraque (Sipapo), west slopes and extreme western summit.
Nrs. 1–63; VEN, NY?.
Nrs. 1–82 [nr. 82 from Puerto Ayacucho];
NY, VEN.


23 Jan-5 Feb 1951: Cerro Guanay (with B. Maguire, C.B. Hitchcock, G. Budowski, and W.H. Phelps, Jr.).


Piñate M., Pedro

1957- ; Venez.; Zoological field assistant (MARNR, Zone 10, Puerto Ayacucho).


Notes: Collected mainly lianas and palms.

Publications: Putz, 1979, in press.

Pintone E., Polidoro

1926- ; Colomb.; Botanist (Herbario Nacional Colombiano, Bogotá).


Notes: Specialist on neotropical Erythroxylaceae.

Plowman, Timothy

1944- ; U.S.; Botanist (Field Museum of Natural History, Chicago).

20-23 Feb 1979: Puerto Ayacucho and vicinity.

Notes: Collected mainly living plants for The New York Botanical Garden.

Pulido F., Juan R.

1926- ; Venez.; Entomological technician (Ministerio de Sanidad y Asistencia Social, Maracaay).

18-29 Mar 1979: Puerto Ayacucho and vicinity (with B. Trujillo).

Putz, Francis E.

1952- ; U.S.; Plant ecologist (Cornell University, Ithaca, U.S.A.).

16 Feb 1979: Puerto Ayacucho and vicinity (with O. Huber).

Pyykkö, Maire

1952- ; Finl.; Plant anatomist (Univ. of Helsinki, Finland).

5-10 Jan 1978: Puerto Ayacucho and surroundings (with O. Huber and L. Cárdenas de Guevara).

Rangel U., Carlos

1951- ; Venez.; Forster (MARNR-CODESUR, Zone 10, Puerto Ayacucho).

Notes: Collected mainly lianas and palms.

Publications: Putz, 1979, in press.

Redmond, Parker

19??- ; U.S.; Amateur botanist.

3 Mar 1977: Canaripo (with J.A. Steyermark).

4 May 1977: Puerto Ayacucho, Tobogán de la Selva (with J.A. Steyermark and O. Huber).

30 Apr 1978: Yutajé, Caño Coro-coro (with J.A. Steyermark).
J.A. Steyermark and M. Griot).
Notes: One-day field trips made in Mr. Redmond’s private aircraft.
Reyes Q., E.A.
1951–; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).
Rodriguez, Henry
1945–; Venez.; Forestry botanist (ULA, Fac. de Ciencias Forestales, Mérida).
Rogers, George K.
1952–; U.S.; Botanist (Univ. of Michigan, Ann Arbor).
Nrs. 13–44; MICH, NY, VEN, U.
Notes: Collected mainly Henriquezia and Platyacpum.
1–20 Nov 1979: Puerto Ayacucho, Cerro Yapacana [base and summit], Maroa, Río Temi, Río Atabapo.
Nrs. 54–102; MICH, NY, VEN, some at U.
Notes: Collected mainly Gleasonia, Henriquezia, and Platyacpum.
Publications: Rogers, 1981a, in press.
Rojas, Aníbal C.
19??–; Venez.; Chemist (UCV, Fac. de Ciencias, Caracas).
15–27 Feb 1978: Savannas and forests at west base of Cerro Yapacana (with S. Tillett and O. Huber).
Romero, Gustavo
1957–; Venez.; Ecologist (Ministerio de Agricultura y Cria, Fondo Nacional de Investigaciones Agropecuarias (FONAIAP), Puerto Ayacucho).
1982: Puerto Ayacucho and surroundings.
Few nrs. [irregular collections, mainly orchids]; Herbario Regional del MARNR, Puerto Ayacucho.
Rooden, Jan van
1942–; Dutch; Botanist (Univ. of Utrecht, Netherlands).
Rucci, Ivana
195?–; Ital.; Ethnomedicine (visiting scientist).
Ruiz Terán, Luis
Nrs.
4512a–4546: Pozo Azul, 1 Aug 1969.
MER, VEN.
Notes: Notebooks nrs. 103–109, deposited at MERF.
Nrs.
4982–4999: San Carlos de Río Negro, Plaza, 18 Jan 1968.
5000–5031: San Carlos de Río Negro to Solano, 19 Jan 1968.
5032–5050: San Carlos south to Tibaduco, 20 Jan 1968.
5051–5072: San Carlos south to Tíbaduco, 22 Jan 1968.
5117–5118: [San Carlos de Río Negro] [s.l.], 27 Jan 1968.
5119: Cucui [Brazil], 28 Jan 1968.
5120–5143: Santa Rosa de Amanadona, 29 Jan 1968.
5144–5172: Santa Rosa on trail to Caño Janabo, 30 Jan 1968.
5173–5196: Santa Rosa de Amanadona, 31 Jan 1968.
5197–5201: Río Negro, right bank near Brazil-Colombia frontier, 1 Feb 1968.
5202–5211: Base of Piedra Cocuy, 2 Feb 1968.
5221–5225: Brazil, approximately 500 m from frontier post, 5 Feb 1968.
5226–5238: Solano, Caño Casiquiare, 8 Feb 1968.
5239–5253: San Carlos de Río Negro, near airport, 9 Feb 1968.
5254–5265: San Carlos, south of Caño Tíbaduco, 10 Feb 1968.
5268a–5275: San Carlos, garden at Misión Salesiana, 12 Feb 1968.
5280–5294b: San Carlos, trail to Marimajari, 14 Feb 1968.
5295–5303: Isla de Mayabo, about 4 km south of San Carlos de Río Negro, 15 Feb 1968.
5313–5316: Tropical savanna near Itaya, 18 Feb 1968.
5404–5407: Guacharo [Brazil], 28 Feb 1968.
5408–5417: Monserrate [Brazil], 1 Mar 1968.
5455–5457: Río Atabapo, near San Fernando, 5 Mar 1968.
5461–5462: Río Atabapo, 7 Mar 1968.
5463–5467: Rio Atabapo, 8 Mar 1968.
6067–6099: Río Atabapo, between San Fernando and Isla Sapo, 1 Apr 1971.
MER.
Notes: Notebooks at MERF.

RUIZ ZAPATA, THIRZA
1949– ; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).
Nrs. 3845–4040; MY, Herbario Regional del MARNR, Puerto Ayacucho.
Notes: Botanical excursion to T. F. Amazonas of members of the Botany Department of UCV, Fac. de Agronomía, Maracay, conducted by T. Ruiz Zapata. Other members: Dorys Borges, Celia Moreno, Roger Ramírez, Norca Rojas, Juan Hernández, and Romelia Parra.

RUTKIS, EDGARS
1912– ; Venez.; Botanical assistant (UCV, Fac. de Ciencias, Caracas).
Nrs.
214–223: 0–4 km on road to Solano [under construction], 27 Oct 1970.
241–244: Road to Solano, 30 Oct 1970.
Notes: nr. 213 was collected in the Gran Sabana region (Estado Bolivar). Nrs. 241 (= Polycnium vittatum, Orchidaceae) and 243 (= Gongora atropurpurea, Orchidaceae) are wrongly indicated on VEN labels as 421
and 423, respectively. VEN.

SALAROLI, STEFANO
1957- ; Ital.; Architect (visiting scientist).
Nrs. 1–39; MYF.

Salcedo, Pedro
1952- ; Venez.; Forestry technician (ULA, Fac. de Ciencias Forestales, Mérida).

Sastre, Claude
19??- ; French; Botanist (Muséum National d'Histoire Naturelle, Laboratoire de Phanérogame, Paris).
18 Mar 1971: Puerto Ayacucho and vicinity (with P. PINTO).
Notes: Specialist on South American Ochnaceae.

Schmidt, Hermann
18??-19??; Germ.? or Braz.?
1907–1908: Upper Río Negro [Brazil only?] (with L. WEISS).
Notes: Possibly the same person who accompanied Koch-Grunberg on his expedition from Roraima to the Orinoco, 1911–1913.

SCHOMBURGK, ROBERT HERMANN (Map 6).
1804–1865; Germ.; Explorer, naturalist.
Itinerary in T. F. Amazonas:
31 Jan 1839: Entered Venezuela, coming from the upper Río Uraricoera [Brazil] by crossing the Uraricoera-Orinoco watershed at the headwaters of Río Matakuni in the Warima [= Parima] mountains.
5 Feb 1839: Crossed mountain savannas [= Simarawochi?] in west-southwest direction in the Warima mountains.
8 Feb 1839: Kikiritza mountain (watershed between upper Río Ventuari and Cundanama [= Cuntinamo]).
11 Feb 1839: Entered Río Parámu [= Padamo].
15 Feb 1839: Followed the south course of Río Parámu.
21 Feb 1839: 9 A.M. entered Río Orinoco via Río Matakuni.
22–24 Feb 1839: Rest at Esmeralda.
25 Feb 1839: Afternoon, left Esmeralda, entered Casiquiare.
26–28 Feb 1839: Casiquiare.
1 Mar 1839: Lake Vasiva.
2 Mar 1839: Passed mouth of Río Siapa.
3 Mar 1839: Passed mouth of Río Pacimoni, Piedra Vanari [= Guanari], Solano.
4 Mar 1839: Junction of Casiquiare and Río Guainia, San Carlos de Río Negro.
7 Mar 1839: Passed Piedra Cocuy into Brazil.
Schomburgk's collections are widely distributed in Europe: BM, G, K, OXF, P. Publications: Schomburgk, 1840a,b, 1841, 1931; Bentley, 1841; France, 1971.

SCHULTES, RICHARD EVANS
1915– ; U.S.; Botanist (Harvard University, Cambridge, Mass.).
Dec 1947: San Carlos de Río Negro and vicinity, Piedra Cocuy (with F. Lopez).
Nrs. 9256–9293: San Carlos de Río Negro and vicinity, 9 Dec 1947 (some labels at VEN bear the date 15 Dec 1947).
Nrs. 9380–9400a: At mouth of Río Casiquiare into Río Negro, 17 Dec 1947.
All collections at GH, US, K, few at VEN.
Notes: Collected widely in adjoining Colombian Amazonia (Vaupés, Guainia, etc.) specializing on rubber trees (Hevea).

SCHWABE, WILLMAR
25–28 Dec 1964: Puerto Ayacucho and vicinity, up to Isla Raton.
Few nrs. [s.n.]; VEN.
Notes: Dates not confirmed.

SPRUCE, RICHARD (Map 7)
1817–1893; Brit.; Botanist.
1853–1854: Botanical explorations in Vene-
Map 6.—Exploration by Schomburgk, 1839 (number/roman numeral = day/month).
Map 7.—Exploration by Spruce, 1853–1854 (number/roman numeral = day/month).
Itinerary:
1 Apr 1853: Left Marabitanas [Brazil] for San Carlos.
3 Apr 1853: Reached the Brazil-Venezuela frontier.
11 Apr 1853: Reached San Carlos de Río Negro.
11 Apr–26 Nov 1853: At San Carlos and vicinity.
19 Jul 1853: Ascent of Piedra Cocuy.
27 Nov–21 Dec 1853: On the Río Casiquiare:
  27 Nov 1853: Left San Carlos at 10 A.M.; reached Raudal at mouth of Río Guainia at 4 P.M.
  29 Nov 1853: Reached Solano at 8 A.M.
  30 Nov 1853: Reached rock of Guanari in the afternoon.
  1 Dec 1853: Stayed at Guanari until noon; at 5 P.M. reached Buena Vista.
  2 Dec 1853: Reached Santa Cruz at sunset.
  3 Dec 1853: Reached Quirabuena after sunset.
  5 Dec 1853: Passed mouth of Río Siapa a little past noon.
  7 Dec 1853: Passed Cerro de Canumata on left bank at 4 P.M.
  9 Dec 1853: Reached entrance of Lago de Vasiva at 2 P.M.; after 2 hrs. reached the lake.
  11 Dec 1853: Reached pueblo de Ponciano on left bank at 3 P.M.; passed Caño Itiniiini [passage to Río Guainia].
  13 Dec 1853: Reached deserted pueblo of Capibara early in morning.
  15 Dec 1853: First view of Duida.
  17 Dec 1853: Reached pueblo of Monagas called Camaciano.
  18 Dec 1853: Left Monagas a little before noon; 1½ hrs. later passed mouth of Caño Dorotomuni.
  21 Dec 1853: Reached Caño de Calipo little after noon.
21–28 Dec 1853: On the Río Orinoco:
23 Dec 1853: Reached playa in sight of Esmeralda.
24 Dec 1853: Reached Esmeralda at 10 A.M.
28 Dec 1853: Left Esmeralda for Río Cunicunuma.
[29?] Dec 1853–6 Jan 1854: On Río Cunicunuma:
  1 Jan 1854: Passed first fall of Río Cunicunuma.
  2 Jan 1854: At base of second fall (Uarinama [= Guarinuma?]) at 10 A.M. start; at 5 P.M. reached the pueblo at base of third fall (Tuarupána).
  2–3 Jan 1854: At Tussari’s house.
  4 Jan 1854: Left Tussari’s pueblo early in the morning; passed first raudal.
  6 Jan 1854: Entered the Orinoco at 8 A.M.
  7–27 Jan 1854: On the Río Casiquiare:
    7 Jan 1854: Reached mouth of Río Casiquiare at noon.
    9 Jan 1854: Reached settlement of Río Casiquiare.
    12 Jan 1854: Reached settlement of Monagas before noon.
    12–20 Jan 1854: At Ponciano.
  21 Jan 1854: Left Ponciano; entered Vasiva towards night.
  25 Jan 1854: Left Vasiva in the afternoon.
27 Jan–25 Feb 1854: On the Ríos Pacimoni and Yatúa:
  27 Jan 1854: Entered mouth of Río Pacimoni a little after noon.
  31 Jan 1854: Reached lower mouth of Caño Baria.
  4 Feb 1854: Reached pueblo of Custodio about 4 P.M.
  5–6 Feb 1854: Travel up the Río Yatúa.
  6 Feb 1854: Reached Caño of Santa Isabel (Uaranaka).
[7?] Feb 1854: Reached port of Santa Isabel.
11–12 Feb 1854: Trip to Cerro Imei (Cerro de Abispa).
14 Feb 1854: Back to San Custodio.
15 Feb 1854: Ascent to Cerro Tarurumari,
a little north of the village of San Custo- 
dio.

[16?] Feb 1854: Descended the Pacimoni 
[Yatúa]; ascent of low granite rock [Laja 
Catipán] in the afternoon.

24 Feb 1854: Reached mouth of Río Paci- 
moni.

25 Feb 1854: Botanical collecting at the 
junction of the Río Pacimoni with Río 
Casiquiare.

28 Feb–25 May 1854: At San Carlos de Río 
Negro and vicinity:

28 Feb 1854: Arrived at San Carlos.

Apr–May 1854: Botanical collecting around 
San Carlos.

26 May–17 Jun 1854: On the Río Guainia, 
Pimichín, Temi, and Atabapo:

26 May 1854: Left San Carlos.

4 Jun 1854: Reached Tomo on the Río 
Guainia [Colombia].

4–8 Jun 1854: At Tomo drying plants [Co-
lombia].

9 Jun 1854: Left Tomo for Maroa and Pim-
ichín.

10 Jun 1854: Reached Pimichín in the after-
noon.


de Atabapo.

[15–17] Jun 1854: At San Fernando de Ata-
abapo.

18 Jun–5 Jul 1854: On the Río Orinoco down 
to Maypures:

18 Jun 1854: Left San Fernando de Atabapo 
and reached Marana [Marano].

19 Jun 1854: Passed Cerro de Mono on the 
left bank of the Río Orinoco [Colombia]; 
reached Maypures [Colombia] at dark.

[20–30] Jun 1854: Journey at Maypures [Co-
lombia].

[1–5] Jul 1854: Maypures to San Fernando 
de Atabapo.

5 Jul–12 Aug 1854: With fever in San Fer-
nando de Atabapo.

13–28 Aug 1854: Return from San Fernando 
to San Carlos.

13 Aug 1854: Left San Fernando de Ata-
bapo.

20 Aug 1854: Reached Tomo [Colombia].

20–25 Aug 1854: Rested in Tomo [Colom-
bia].

26 Aug 1854: Left Tomo.

28 Aug 1854: Reached San Carlos de Río 
Negro.

28 Aug–22 Nov 1854: At San Carlos de Río 
Negro and vicinity.

23 Nov 1854: Left San Carlos de Río Negro 
at noon.

24 Nov 1854: Reached mouth of Caño 
Guasie [= Xié, Brazil].

According to Spruce’s communication to Rei-
chenbach f. (1873), a total number of 815 
botanical collections were made by him 
during his stay in Venezuelan territory 
(nrs. 2952–3766):

Nrs.

2952–3157: On the Río Negro.

3158–3213: On the Río Casiquiare.

3214–3266: On the Río Orinoco [including 
Esmeralda and Río Cunucunuma?].

3267–3417: On the Río Casiquiare.

3418–3423, 3435: On the Río Orinoco [in-
cluding Río Cunucunuma?].

3424–3466 [excluding 3435]: On the Río 
Casiquiare [including Río Pacimoni and 
Río Yatúa?].

3467–3567: At San Carlos de Río Negro 
and vicinity [including Río Guainia?].

3568–3670: At Maypures [Colombia].

3671–3700: On the Río Negro [including 
Río Guainia and Pimichín?].

3701–3750: On the Río Orinoco above (S) 
the cataracts and on the Río Atabapo.

3751–3766: On the Río Negro, in Venezu-
ela.

3807–3823: Maypures, San Carlos (numbers 
added after return to Brazil).

Notes: Besides these numbers, Spruce appar-
ently also made some collections without 
numbering (approximately 50–60 nrs.?), 
as well as other collections (mainly palms) 
with a separate numbering sequence (ap-
approximately 20–30 nrs.? (fide Pittier, ined.). At least 60 of the Venezuelan numbers represent collections from more than one locality or date. For at least 27 of Spruce’s Brazilian numbers, Venezuelan material was later added. Spruce’s collections of bryophytes were separately numbered.

It must be kept in mind that at the time of Spruce’s visit to Venezuela, both shores of the Ríos Negro, Guainía, Atabapo, and Orinoco were part of Venezuela; therefore, the number of collections cited by Spruce for Venezuela includes also those made in such localities as Tomo, Cerro del Mono, San Felipe and Maypures, which today belong to Colombia. According to Prance (1971), further “care should be taken in citing Spruce’s collections since many of his Venezuelan collections have often been cited as from Brazil since this is stated on the labels” (loc. cit., page 61).

According to Urban (1906) and Prance (1971), Spruce’s collections were widely distributed by George Bentham to the following herbaria: B, BM, BR, DBN, E, G-BOIS, G-DC (Urban, 1906), GOET, K (main set), LE, M, P, W, and, more recently acquired also by F, GH, and NY (Prance, 1971); other European herbaria with large sets include AWH, CGE, FI, LD, and OXF.

The types of Spruce’s hepatics are at MANCH.

Publications: Reichenbach f., 1873; Spruce, 1908, 1970; Maguire, 1955; Prance, 1971; further details on literature referring to Spruce in Urban, 1906.

STEYERMARK, JULIAN ALFRED (Map 8)
1909–; U.S.; Naturalized Venezuelan since 1973; Botanist (Field Museum of Natural History, Chicago [until 1958]; Instituto Botánico, Caracas [since 1959]).

Aug–Sep 1944: Expedition to Cerro Duida.
Nrs. 57,727–57,728: Río Orinoco, Isla Hormiga (between Sanariapo and San Fernando de Atabapo), 17 Aug 1944.
58,411–58,421: Around San Fernando de Atabapo, 7 Sep 1944.
58,422: Along Río Orinoco, between Tamatama and San Fernando de Atabapo, 7 Sep 1944.
58,423–58,429: Raudal Santa Bárbara, 7 Sep 1944.
58,430–58,431: Mouth of Río Sanariapo, 8 Sep 1944.
58,432–58,433: San Fernando de Atabapo [possibly a confused locality with Sanariapo], 8 Sep 1944.
58,434–58,448: Mouth of Río Sanariapo, 8 Sep 1944.
58,449–58,506: Vicinity of Sanariapo, 8 Sep 1944.
58,507: Between Sanariapo and Puerto Ayacucho, 8 Sep 1944.
58,508–58,509: Along Río Sanariapo, 8 Sep 1944.
58,510–58,526: Vicinity of Puerto Ayacucho, 11 Sep 1944.
58,527–58,528: Along Río Orinoco at Puerto Ayacucho, 11 Sep 1944.

Notes: Exploration for the “Cinchona Mission” in Venezuela.

Publications: Steyermark and Meyer, 1945–
MAP 8.—Exploration by Steyermark, 1944–1982 (clustered dots = intensive collecting).

Apr–May 1970: Expedition to San Carlos de Río Negro, Río Pacimoni, Río Yatúa, Maroa, Pimichín, Yavita, and Cerro Yapacana (with G.S. Bunting).

Nrs. 102,434–102,475: Río Pacimoni, from mouth up to Pueblo Viejo, 8 Apr 1970.
102,476–102,504: Pueblo Viejo, Bruno (Guaibana, open laja on left bank of Río Pacimoni), Laja Catipán (Río Yatúa, right bank), 9 Apr 1970.
102,505–102,525: Río Yatúa to Cerro Arauica, 10 Apr 1970.
102,661–102,663: Savannas near Pueblo Viejo, 15 Apr 1970.
102,664–102,674: Pueblo Viejo, Río Casiquiare, Yacámi, Río Negro, 16 Apr 1970.
102,799–102,850: Savanna 1 km east of Maroa, Pimichín, 20 Apr 1970.
102,851–102,940: Road, Yavita to Pimichín, 21–22 Apr 1970.
102,941–102,972: Río Temi around Yavita, 22 Apr 1970.
102,973–103,012: Caño Cotúa, west base of Cerro Yapacana, 30 Apr 1970.
103,013–103,066: Southwest base of Cerro Yapacana, up to 400 m, 3 May 1970.
103,067–103,099: Southwest talus slopes of Cerro Yapacana, 400–825 m, 4 May 1970.
103,100–103,101: Between Caño Cotúa and base camp, 4 May 1970.
103,102–103,190: Summit of Cerro Yapacana, 1000–1200 m and lower (–825 m), 5–7 May 1970.
103,191–103,267: Southwest slopes of Cerro Yapacana, 825–550 m, forest at base, savannas at base, 7 May 1970.
Note: A large part of these Brazilian collections were lost during transport from Summit Camp at Sierra Neblina to Caracas.
Notes: These Steyermark collections from Brazil are not cited in Prance (1971).

Sep 1971: Expedition to Cerro Autana [helicopter expedition conducted by C. Brewer-Carias and supported by CODESUR].
Nrs. 105,104–105,234,105,236: Cerro Autana, summit, 1230 m, 20–22 Sep 1971.

May 1972: Expedition to the Sierra Parima, Venezuelan-Brazilian frontier (with the Venezuelan-Brazilian Frontier Commission, helicopter expedition conducted by J. Pantchenko).
Nrs.
105,904–105,947: Sierra Parima, Frontier Camp 3, 1300 m, 18 May 1972.
105,948: Río Putaco, affluent of Río Ocamo, 175 m, 18 May 1972.
106,147: Río Putaco, affluent of Río Ocamo, 175 m, 23 May 1972.
Apr–May 1973: Expedition to the Sierra Par-
ima, Venezuelan-Brazilian frontier (with the Venezuelan-Brazilian Frontier Commission, helicopter expedition conducted by J. Pantchenko).

Nrs. 106,968–107,105: Simarawochi, headwaters of Río Matakuni, 800–860 m, 18–26 Apr 1973.


107,108–107,205: Simarawochi, headwaters of Río Matakini, 800–870 m, 29 Apr–2 May 1973.

107,206–107,208: [Edo. Bolívar, Sierra Pakaraima, 2 May 1973].

107,209–107,211: Simarawochi, headwaters of Río Matakuni, 830 m, 2 May 1973.

107,212–107,381: [Edo. Bolívar, Sierra Pakaraima, 4–5 May 1973].

107,382–107,412: Simarawochi, headwaters of Río Matakuni, 790–800 m, 8 May 1973.

107,413: [Edo. Bolívar, Sierra Pakaraima, 8 May 1973].


107,490–107,558: Sierra Parima, Frontier Point #7, headwaters of Río Matakuni, 1450–1525 m, 19 May 1973.


Nrs. 112,790–112,858.


Nrs. 113,805–113,840.


Nrs. 113,842–113,877.


Nrs. 113,880–113,930.

20 Jun 1977: San Juan de Manapiare, Yutajé (with P. Redmond and M. King).

Nrs. 113,932–113,954: San Juan de Manapiare and vicinity.

Nrs. 113,955–113,972: Yutajé.

30 Apr 1978: Yutajé, Caño Coro-coró (with P. Redmond).

Nrs. 117,044–117,112.

12 May 1978: Santa Bárbara and mouth of Río Ventuari (with O. Huber, P. Berry and P. Redmond).

Nrs. 117,113–117,176.

22 Feb 1979: Yutajé, Caño Coro-coró (with M. Griot and P. Redmond).

Nrs. 117,896–117,936.


Nrs. 122,111–122,568.

Notes: Botanical inventory of lower valley of the Río Cataniapo, in the area to be flooded by the construction of a dam for hydroelectrical power (Joint Program of Instituto Botánico, CONICIT, and Missouri Botanical Garden).


Nrs. 123,620–123,669.


Notes: The collections made on Cerro Marahuaca and Cerro Sipapo were originally numbered under Steyermark’s numbering sequence from 124,096 to 124,245, and later transferred to Maguire’s numbering sequence, 65,563–65,712 [see B. MAGUIRE]. Helicopter expedition conducted by Charles Brewer-Carias.


Nrs. 124,336–124,356: Mission of Ocamo and
vicinity, 15 Feb 1981.

Notes: Helicopter expedition conducted by Charles Brewer-Carias.


Nrs.
125,635–125,695: Río Cunucunuma at Culebra, 28 Jan 1982.
125,735–125,791: Río Cunucunuma at Culebra, 29 Jan 1982.
125,792–125,818: North facing slopes of Cerro Duida, 600–800 m, 29 Jan 1982.
125,819–125,823: North facing slopes of Cerro Duida, 400 m, 29 Jan 1982.
125,824–125,867: Río Cunucunuma at Culebra, 30 Jan 1982.
125,868–125,888: Base of north end of Cerro Duida, 300 m, 30 Jan 1982.
125,889–126,104: Cerro Marahuaca, summit, 2330–2580 m, 31 Jan–4 Feb 1982.
126,105–126,125: North end of Cerro Duida, 800–900 m, 6 Feb 1982.
126,153–126,156: North end of Cerro Duida, 200–700 m, 10 Feb 1982.
126,198–126,235: Río Cunucunuma, lower section of Caño Negro, 7 Feb 1982.
126,236–126,240: Río Cunucunuma, 8 Feb 1982.
126,241–126,271: Caño Negro, towards Cerro Duida, 200 m, 8 Feb 1982.
126,272–126,286: North end of Cerro Duida, southwest of Culebra, 200 m, 9 Feb 1982.
126,288–126,333: Marahuaca Massif, 2480 m, 9 Feb 1982.
126,334–126,369: Marahuaca Massif, 2450 m, 10 Feb 1982.
126,370–126,402: Cerro Duida, along east escarpment, 1230 m, 10 Feb 1982.
126,404–126,411: Cerro Duida, wet savannas, 10 Feb 1982.
126,412–126,442: Cerro Duida, north end, 1400 m, 10 Feb 1982.
126,443–126,471: Cerro Huachamacari, summit, 1800 m, 10 Feb 1982.

Notes: All phanerogamic collections are under Steyermark et al. (837 nrs.), whereas all cryptogamic collections (420 nrs.) are under Guariglia et al. (see Guariglia, M.). Helicopter expedition conducted by Charles Brewer-Carias.

Steyermark’s collections from 1944 are deposited at F, NY, US, VEN; all later collections, VEN, NY, US, MO, U, K.

Suárez, Nelly
19??– ; Venez.; Biologist (CODESUR-MARNR, Zone 10, Puerto Ayacucho).

Apr 1978: Río Orinoco to San Fernando de Atabapo and Santa Bárbara (with G. Morillo and J. Camico).

Tate, George Henry Hamilton


Nrs.
1–147: [Brazil: Manaus, Muyrapenima, Santa Isabel, Camanaos, Yucabi, São Gabriel, Preguisa].
148–168: Venezuela: Piedra Alta [= Laja Alta], Río Negro, Río Casiquiare (San Sebastián, Buena Vista, Quemapure) [in irregular sequence; includes also nrs. 160–163 from San Carlos de Río Negro cited as belonging to Brazil].
169–965: Venezuela: Esmeralda, Cerro
Duida [south slopes and south summit], Esmeralda, 1 Oct 1928–18 Mar 1929.

966–1002: [Brazil: Rio Negro (Yucabí, Santa Isabel, São Gabriel)].

1003: [Colombia: opposite mouth of Río Casiquiare].

1004–1051: Venezuela: Esmeralda, Cerro Duida.

1052–1060: [Brazil: Rio Negro (Yucabí, Santa Isabel)].

1061–1065: Venezuela: Esmeralda [Muscì]. First set at NY; dupl. at B, G, K, US.

Notes: First ascent of a tepui in T. F. Amazonas. Tate's Brazilian collections are not cited by Prance (1971).

Publications: Gleason, 1929, 1931; Tate and Hitchcock, 1930; Tate in Gleason, 1931.

THOMAS, WILLIAM WAYT

1951–; U.S.; Botanist (Univ. of Michigan, Ann Arbor).

2–21 Nov 1979: Puerto Ayacucho, Cerro Yapacana (8–10 Nov), San Fernando de Atabapo (1 Nov), Maroa (15 Nov), Yavita (16, 19 Nov), Santa Cruz on the Río Atabapo near confluence with Río Atacavi and Río Temi (17–18, 20 Nov). Nrs. 2533–2693; MICH, VEN; some specimens also at CM and NY.

Notes: Field research for doctoral dissertation at University of Michigan on Rhynchospora sect. Dichromena and their pollinators.

TILLETT, STEPHEN S.

1930–; U.S.; Botanist (UCV, Fac. de Farmacia, Herbario “Ovalles”).

11 Feb 1974–9 Jun 1982:

Nrs. 745-249–746-452: San Fernando de Atabapo and vicinity (Caño Morocoto and Sabana Morocoto, 1 hour downstream on Río Orinoco; to 20 km along trail towards Santa Bárbara; Río Orinoco upstream to Isla Guacamayo, Matacamí; vicinity of Santa Bárbara; 2 hours upstream on Río Atabapo, Caño Cumare and Chamuchina) (with L. Gutiérrez), 27 May–3 Jun 1974.


7811-162–7812-337: Caño Perro de Agua, Caño Cotúa, savannas at west base of Cerro Yapacana, Caño Yagua, Santa Bárbara, and trail towards San Antonio (with O. Huber), 29 Nov–12 Dec 1978.


All collections are at MYF and VEN; collections from Cerro Duida and Cerro Marahuaca also at NY, HB, K, and U.

Notes: Dr. Tillett uses a compound numera-
tion system including the year (first two digits), the month (next one or two digits), and finally (following the hyphen) the sequential numeration from one on for each year. Many specimens are voucher specimens of bulk samples of leaves, wood, and bark for pharmacological screening at the laboratories of the Facultad de Farmacia, UCV, Caracas.

Specialist on New World Passifloraceae and ethnobotany; founder and curator of the Herbario “M. OVALLES” (MYF) at the Faculty of Pharmacy of Universidad Central de Venezuela (UCV) in Caracas since 1974.


Trujillo, A.
19??- ; Venez.; Field assistant.
16–26 Nov 1977: Puerto Ayacucho, Reserva Forestal del Sipapo (Río Cuao, Río Sipapo) (with G. Morillo).

Trujillo, Baltasar
1927– ; Venez.; Botanist (UCV, Fac. de Agronomía, Maracay).
Nrs. 14933–15287; MY.

Uhl, Christopher
1949– ; U.S.; Ecologist (Univ. of Georgia, Athens, U.S.A.).
Sep–Dec 1974: San Carlos de Río Negro and vicinity, IVIC study sites.
Approximately 250 nrs.; VEN.
17–24 Sep 1975: San Carlos de Río Negro and vicinity, road to Solano (IVIC study sites) (with P. Berry).
1975–present: San Carlos de Río Negro and vicinity (IVIC study sites; mainly successional (disturbed) areas).
Approximately 75 nrs.; MO.
Universidad Central de Venezuela (UCV)
Principal and largest university of Venezuela, located in Caracas and Maracay (Agronomy and Veterinary Faculties).

Botanical collectors of UCV in T. F. Amazonas (* = under temporary contract):
Agostini, Getulio (Fac. de Ciencias, Caracas)
Aristeguieta, Leandro (Fac. de Ciencias, Caracas)
* Brücher, Heinz (Fac. de Ciencias, Caracas)
* Bunting, George S. (Fac. de Agronomía, Maracay)
Cárdenas de Guevara, Lourdes (Fac. de Agronomía, Maracay)
Castillo, Aníbal (Fac. de Ciencias, Caracas)
Cortés, Álvaro O. (Fac. de Ciencias, Caracas)
* Ewel, John J. (Fac. de Agronomía, Maracay)
Fariñas, Mario (Fac. de Ciencias, Caracas)
Fernández, Antonio (Fac. de Agronomía, Maracay)
Ferrigni, Nelson (Fac. de Farmacia, Caracas)
Foldats, Ernesto (Fac. de Ciencias, Caracas)
Guariglia, Mario (Fac. de Ciencias, Caracas [until 1979]).
Guinand, Luisa F. (Fac. de Ciencias, Caracas)
Gutiérrez, Luis (Fac. de Farmacia, Caracas)
Hasegawa, Masahisa (Fac. de Ciencias, Caracas)
Hernández Ramos, Juan F. (Fac. de Agronomía, Maracay)
Iturriaga, Teresa (Fac. de Ciencias, Caracas)
Jaffée, Werner (Fac. de Ciencias, Caracas)
Jiménez, Hernán (Fac. de Farmacia, Caracas)
Medina, Ernesto (Fac. de Ciencias, Caracas [until 1970])
Mondolfi, Edgardo (Fac. de Ciencias, Caracas)
Ortiz, Rafael (Fac. de Ciencias, Caracas)
Pannier, Federico (Fac. de Ciencias, Caracas)
Parra Rondón, Romelia (Fac. de Agronomía, Maracay)
Reyes, E.A. (Fac. de Farmacia, Caracas)
Rojas, Aníbal (Fac. de Ciencias, Caracas)
RUIZ ZAPATA, THIRZA (Fac. de Agronomía, Maracay)
RUTKIS, EDGARS (Fac. de Ciencias, Caracas)
TILLET, STEPHEN S. (Fac. de Farmacia, Caracas)
TRUJILLO, BALTASAR (Fac. de Agronomía, Maracay)
VARESCHI, VOLKMAR (Fac. de Ciencias, Caracas)
Velásquez, Justiniano (Fac. de Ciencias, Caracas)
Zorrilla, C.J. (Fac. de Farmacia, Caracas)

Universidad de Los Andes (ULA)
Second major Venezuelan university, located at Mérida.

Botanical collectors of ULA in T. F. Amazonas
(* = under temporary contract):
ARENDS, ERNESTO (Fac. de Ciencias Forestales)
Bautista, Jaime (Fac. de Ciencias Forestales)
CARABOT C., ALFREDO (Fac. de Farmacia)
MARCANO-BERTI, LUIS (Fac. de Ciencias Forestales)
Moraless, Antonio (Fac. de Farmacia)
Rodriguez, Henry (Fac. de Ciencias Forestales)
RUIZ TERÁN, LUIS (Fac. de Ciencias Forestales [until 1968]; Fac. de Farmacia [1969–1979])
Salcedo, Pedro (Fac. de Ciencias Forestales)
VEILLÓN, JEAN PIERRE (Fac. de Ciencias Forestales)

* WESSELS-BOER, JAN G. (Fac. de Ciencias Forestales)

VARESCHI, VOLKMAR
1906– ; Venez.; Botanist, ecologist (UCV, Fac. de Ciencias, Caracas).
5 Jan–16 Feb 1958:
Nrs. 6541–6806: Río Orinoco, Esmeralda, Río Ocamo, Río Casiquiare, Río Negro, Río Guainía, Caño Pimichín, Yavita, Río Temi, Río Atabapo, Río Orinoco ("Humboldt-Gedächtnis-Expedition 1958" [Humboldt Memorial Expedition]) (with K. Mädgefreau); VEN, NY.
29 Aug–20 Sep 1960: Puerto Ayacucho, Sanariapo, Río Atabapo, Río Atacavi (botanical collections made by E. Foldats).
1 Apr 1961–10 Feb 1973:
Nrs.
7546–7571: Puerto Ayacucho, Río Orinoco, Río Atabapo, Laja Pavón; 1–10 Apr 1961; VEN.
7758–7824: Bifurcation Orinoco-Casiquiare; 21 Oct 1962; VEN.
7982–7987: Sabanas de Esmeralda, 8 Dec 1963; VEN.
7992–8017: Puerto Ayacucho, Río Orinoco, Río Atabapo, Río Orinoco, Río Cunucunuma, Esmeralda, Ocamo (with W. Jaffée), 5–21 Aug 1964; VEN.
8158–8182: Sabana de Simada-Vochi [Sierra Parima, headwaters of Río Matacuni], 9 Jul 1967; VEN.
8674–8696: Upper Orinoco, Platanal (Mahekodo-teri); 10 Feb 1973; VEN.

Notes: Vareschi has made a total of 15 field trips to T. F. Amazonas, many of them together with his late friend Dr. Egon Herbig, medical doctor and expert bush pilot, carrying on numerous studies on plant ecology, phytogeography, black and white waters, etc.


VEILLÓN, JEAN PIERRE
1914– ; Swiss; Forester (ULA, Fac. de Ciencias Forestales, Mérida).
7–19 Feb 1978: San Carlos de Río Negro and vicinity; road to Solano.
Nrs. 1–23; VEN.

Velásquez, Justiniano
1937– ; Venez.; Botanist (UCV, Fac. de Ciencias, Caracas).
22 Jan–25 Feb 1969: Esmeralda, Cerro Duida, Caño Casiquiare (with M. FARIÑAS and E. Medina)

Notes: Member of the “Expedición Científica AsoVAC al Alto Orinoco.”

Villa, Nestor
19??– ; Venez.; Field assistant.
1–9 Feb 1977: San Carlos de Río Negro and
vicinity (with G. Morillo).

Wallace, Alfred Russel
1823–1913; Brit.; Biologist.
1 Feb–31 Mar 1851: Caño Pimichín, Yavita.
Notes: All collections lost in fire on ship in Atlantic 6 Aug 1852.

Weiss, Louis
18??–????; ? ; ?
1907–1908: Upper Río Negro [Brazil only?] (with H. Schmidt).
? nrs.; main set at NY.
Notes: Collected mainly mosses and fungi.

Wessels Boer, Jan Gerard
1936– ; Dutch; Botanist (ULA, Fac. de Ciencias Forestales, Mérida; Univ. of Utrecht).
? nrs.; VEN, U, K, MER.
Notes: Specialist on New World Palmae (Arecaceae). His collections in T. F. Amazonas range around his collection nr. 2300.

Williams, Llewelyn (Map 9)
May–Jun 1940: First expedition to T. F. Amazonas.
Nrs.
12965–13158: Puerto Ayacucho, Sanariapo, 18–27 May 1940.
13159–13246: Isla Ratón, 30 May–2 Jun 1940.
13247: Puerto Ayacucho, 3 Jun 1940?
Notes: The following irregular numbers lack definite dates:
Nrs.
13421: Isla Ratón, Jun 1940.
13425–13427: Isla Ratón, Jun 1940.
13428–13442: Puerto Ayacucho, Jun 1940.
13443: Isla Ratón, Jun 1940.
13444: Puerto Ayacucho, ?
13446: Isla Ratón, Apr 1940?
13447–13465: Puerto Ayacucho, Apr–Jun 1940?
13467: Puerto Ayacucho, Jun 1940.
13482: Puerto Ayacucho, Jun 1940.
13484: Puerto Ayacucho, Jun 1940.
13485–13488: Sanariapo, Jun 1940.
13489–13490: Isla Ratón, Jun 1940.
13491–13492: Puerto Ayacucho, Jun 1940.
Nrs.
13825: Mouth of Río Sanariapo, 15 Jan 1942.
13826–13847: San Fernando de Atabapo and vicinity, 17–18 Jan 1942.
13848–13854: Río Atabapo, Caño Rana, 19 Jan 1942.
13855–13859: Raudal Chamucina, Isla Sapo, 19 Jan 1942.
13860–13861: Mouth of Río Yavita [Río Temi?], 20 Jan 1942.
13862–13867: Río Temi, Yavita, 21 Jan 1942.
14041–14179: Río Temi, Yavita and vicinity, 28 Jan–4 Feb 1942.
14189–14370: Maroa and vicinity, 9–14 Feb 1942.
14371–14436: Maroa and vicinity, 16–20 Feb 1942.
14446–14448: Maroa and vicinity, 21 Feb 1942.
14694–14710: Santa Rosa de Amanadona, 7–8 Mar 1942.
14711–14719: El Cocuy, 8 Mar 1942.
14720–14726: San Carlos de Río Negro, 9 Mar 1942.
14727–14733: Río Casiquiare, Solano, 10 Mar 1942.
Map 9.—Exploration by Williams, 1940–1944 (roman numeral = month, clustered dots = intensive collecting).
14786–14796: Confluence Ríos Guainía and Negro, 13 Mar 1942.
14797–14800 Río Guainía, 17 Mar 1942.
14801: Solano, 14 Mar 1942 [out of temporal sequence].
14802–14809 Maroa, 19 Mar 1942.
14810: Río Guainía, 20 Mar 1942.
14928–14948: Caño Pimichín, 31 Mar–1 Apr 1942.
14949–14951: Pimichín to Yavita, 2 Apr 1942.
14952–14958: Yavita, 3 Apr 1942.
14959–14963: Río Sanariapo, 15 Apr 1942.
14964–14968: Minisia, 18 Apr 1942.
14969–14977, 14981: Guarinuma (Río Atabapo), 10 Apr 1942 [out of temporal sequence].
14978: San Fernando de Atabapo, 17 Apr 1942 [out of temporal sequence].
14979–14980: Siquita, 12 Apr 1942 [out of temporal sequence].
14982–15002: Raudal Trapichote (Río Orinoco), 20–21 Apr 1942.
15003–15006: Raudal San Francisco (Río Orinoco), 20 Apr 1942.
15007: Raudal Santa Bárbara, 25 Apr 1942.
15085: Mouth of Caño Pato, 29 Apr 1942.
15086–15164: Tamatama, 2–5 May 1942.
15165–15189: Bifurcation of Orinoco into Casiquiare, 5 May 1942.
15190–15221: Tamatama, 6–7 May 1942.
15222–15244: Between Tamatama and Esmeralda, 7 May 1942.
15245–15301: Tamatama, 7–9 May 1942.
15520–15832: Capihuara [= Capibara, on the Río Casiquiare], 23 May–9 Jun 1942.
15833–15869: Tamatama, 12–14 May 1942 [excluding nr. 15836, collected at Capihuara on 10 May 1942].
15870: Between mouth of Río Parguaza and Raudal Atures, 14 Jun 1942 [doubtful locality].
15945: Puerto Ayacucho, 1 Jul 1942.
15946–16068: Mouth of Río Sanariapo, Sanariapo, 2–6 Jul 1942.
16069–16072: Puerto Ayacucho, 8 Jul 1942.
Notes: The following nrs. 16,073–16,178 have been collected in different localities of T. F. Amazonas during different months of the year 1942, without indication of exact date:
Nrs.
16,077, 16,128, 16,158, 16,162: San Carlos de Río Negro, Apr and Jun 1942.
16,129: Isla Guarinuma (near San Carlos de Río Negro), Feb 1942.
Notes: During 1942 to 1944, Dr. Williams
served as Senior Field Technician in the Rubber Development Corporation, in charge of organizing and supervising the procurement of wild rubber in the upper Orinoco-Casiquiare basin. During this period the following botanical collections were made in T. F. Amazonas:

Nrs.
16179–16183: Capihuara (Río Casiquiare), 3 Oct 1943.
16184: San Carlos de Río Negro, 30 Nov 1943.
16185: Santa Rosa de Amanadona, 30 Nov 1943.
16186–16187: Jojú [?], Casiquiare, Jan 1944.
16188: Playa Candela (middle Río Casiquiare), Feb 1944.
16189, 16193–16199: Caño Yureba (middle Río Ventuari), Jan 1944 [out of temporal sequence].
16200–16201: Caño Catirico (middle Río Casiquiare), Feb 1944.
16202–16203: Santa Rosa de Casiquiare, Feb 1944.
16204: Playa Candela (middle Río Casiquiare), Feb 1944.
16205–16206: San José (lower Río Casiquiare), Feb 1944.
16207: Lower Río Siapa, Feb 1944.

Notes: All typewritten field notes at VEN. Botanical specimens collected in quadruplicate: first set at F; duplicate at VEN, NY, US. Several thousand wood samples at MAD ("Samuel J. Record Memorial Wood Collection").

The data referring to the last expedition in 1943–1944 are sometimes confused and out of temporal and/or geographical sequence. Williams also made extensive botanical and wood collections in the Caura and Paragua basins (northeast of T. F. Amazonas) during 1939–1940.

Wood, Charles
19??– ; U.S.; Botanist (U.S. Peace Corps in Venezuela).

WURDACK, JOHN JULIUS
15 Mar–24 Apr 1953: Upper Río Orinoco, Río Casiquiare, Río Negro, down to Piedra Cocuy, Río Guainía (with B. Maguire and C.K. Maguire).
7 Nov 1953–18 Feb 1954: Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Yatúa, Cerro de la Neblina (with B. Maguire and G.S. Bunting).
Nrs. 39750–39999, 40849–41427: [Only a few collections were made in T. F. Amazonas, on the Río Orinoco between Puerto Ayacucho and the mouth of Río Meta, during the first days of the expedition.]
11 Sep–16 Oct 1957: Upper Río Orinoco, Río Atabapo, Río Guainía, Río Casiquiare, Río Pacimoni (with B. Maguire, C.K. Maguire, and W.M. Keith, Jr.).
29 May–8 Aug 1959: Middle and upper Río Orinoco, Río Atabapo, Río Casiquiare, Río Guainía, Río Pacimoni, Río Siapa up to Raudal Gallineta (with L. Adderley).
Nrs. 42,656–43,798; NY, VEN, US, MO, F, U, K, BM and others.
Notes: Specialist on New World Melastomataceae, Polygalaceae. Member of the “New York Botanical Garden’s Exploration Program of the Flora of the Guayana Highland” during 1950–1959 (see Map 5).

YERENA, EDGARD
1960– ; Venez.; Student of biology.
5–18 Nov 1982: Caño Iguana, tributary of Río Asita (5°24’N, 65°34’W, 300 m), upper Ventuari basin.
Nrs. 1–66; MYF.
Notes: Ethnobotanical collections among Hoti Indians; part of the collections accompanied by W. Coppens.

Zinck, Alfred
1938– ; Venez.; Soil scientist (MARNR, Caracas).
14–16 Jul 1980: Puerto Ayacucho to Río Autana (with S. TILLETT and O. Huber, “Heli-trip-VI” [first part only]).

Zorrilla, C.J.
1953– ; Venez.; Pharmacy student (UCV, Fac. de Farmacia, Caracas).

LIST OF POSSIBLE COLLECTORS

The following persons may have collected plants in T. F. Amazonas, but no specimens have been seen by us, nor have they been cited in pertinent taxonomic or floristic literature concerning the Territorio Federal Amazonas:

Good, Kenneth (U.S. anthropologist; research, since 1976, on protein consumption among Yanomami Indians of the upper Orinoco and Siapa).
Hames, Raymond B., and I.L. Hames (U.S. anthropologists; research, since 1976, on cultural ecology, including Indian basketry, in the Padamo region; Hames and Hames, 1976).
Missionaries, of the evangelic “New Tribes Missions” (mainly U.S. citizens).
Missionaries, of the Catholic Missions (“Padres Salesianos” [e.g., Padre Cocco], and Jesuits; mainly Italian and Spanish citizens).
Zerries, Otto (German anthropologist, research on Yanomami Indians at Platanal, during 1954–1955, with M. Schuster; cites plant collections on page 17 of his publication “Mahekodotedi” [1974]; possibly they are deposited at M?).

Remarks on Future Explorations

As is indicated on Map 10, most of the botanical collections made in T. F. Amazonas have been concentrated along riverine lowland areas and on the main mountains. There still remain large areas that have never been visited by any botanist, and their exploration is the great challenge for future generations of field botanists in this remote part of Venezuela.

The following list contains the approximate total amount of botanical specimens collected by the twenty most important main collectors in T. F. Amazonas during the last 200 years.

<table>
<thead>
<tr>
<th>Collector</th>
<th>Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maguire and collaborators</td>
<td>9000</td>
</tr>
<tr>
<td>Huber</td>
<td>6000</td>
</tr>
<tr>
<td>Steyermark</td>
<td>3900</td>
</tr>
<tr>
<td>Liesner</td>
<td>3000</td>
</tr>
<tr>
<td>Williams</td>
<td>2800</td>
</tr>
<tr>
<td>Guánchez</td>
<td>2300</td>
</tr>
<tr>
<td>Morillo</td>
<td>2000</td>
</tr>
<tr>
<td>Tillet</td>
<td>1900</td>
</tr>
<tr>
<td>Clark, H.</td>
<td>1800</td>
</tr>
<tr>
<td>Davidse</td>
<td>1500</td>
</tr>
<tr>
<td>Wurdack</td>
<td>1250</td>
</tr>
<tr>
<td>Croizat</td>
<td>1200</td>
</tr>
<tr>
<td>Colchester</td>
<td>1000</td>
</tr>
<tr>
<td>Tate</td>
<td>870</td>
</tr>
<tr>
<td>Delascio</td>
<td>840</td>
</tr>
<tr>
<td>Berry</td>
<td>835</td>
</tr>
<tr>
<td>Spruce</td>
<td>815</td>
</tr>
<tr>
<td>Ruiz Terán</td>
<td>760</td>
</tr>
<tr>
<td>Bunting</td>
<td>760</td>
</tr>
<tr>
<td>Lister</td>
<td>750</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43,280</strong></td>
</tr>
</tbody>
</table>

SMITHSONIAN CONTRIBUTIONS TO BOTANY
Map 10.—Botanical collection coverage in T. F. Amazonas from 1800 to 31 Dec 1982 (heavy lines = river trips, circles = heli-trips, clustered dots = intensive collecting).
It may be inferred from the above list that, thus far, approximately 50,000 numbers of botanical specimens (without the inclusion of duplicates) have been accumulated by all the collectors from the entire Territorio. We estimate very roughly that these represent approximately 3000 to 5000 species known from the Venezuelan portion of the Amazon basin.

Doubtless, a few limited regions of T. F. Amazonas may be considered today to be adequately explored and known floristically; these include the region between Puerto Ayacucho and Samariapo, the summit region of Cerro Autana, the area around San Carlos de Río Negro, and, to a certain extent, that around Esmeralda. However, there is little or no botanical knowledge of many other regions, and each trip in them results in new and noteworthy additions to the flora of the Territorio as well as taxa new to science. Remarkable in this respect are the Manapiare basin, which shows very interesting phytogeographical connections with areas in central Brazil, and the region south of the Casiquiare River, which is still very poorly known, especially the lowlands towards the southeast. Among upland areas, many tepuis need much more exploration, especially the slope vegetation; these include the massif Cuao-Sipapo-Paraque, Cerro Guanay, Cerro Camaní, Cerro Yavi, Cerro Parú, and Serranía de la Neblina. Even Cerro Duida, which has received thus far the most intensive botanical collecting (13 expeditions), still has many unexplored parts, especially in the central and marginal eastern and western sections. Cerro Marahuaca, which was for a long time inaccessible, has received much attention during the last few years, but large areas within that great massif still remain unvisited by any naturalist.

One of the least explored areas of T. F. Amazonas is the south-easternmost section, including the basin of the Río Matapire, the adjacent Sierra del Unturán, and the huge massif formed by Serranía de la Neblina, Cerro Avispa, and Cerro Aracamuni. A large expedition with the duration of one entire year is planned to the “Sierra de la Neblina” National Park for the end of 1983, and it is expected that many new and interesting taxa will be discovered during this undertaking.

Undoubtedly, the T. F. Amazonas harbors still many, many botanical treasures to be discovered in the future. We feel confident that Venezuela is fully aware of its privilege in possessing one of the richest and most promising centers of biological diversity and speciation in the entire world. The efforts of the many persons mentioned in this paper are only an initial step towards understanding this biological paradise.
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The following list of references deals mainly with publications concerning the collectors, their itineraries, and other botanical or geographical accounts of their travels in the Territorio Federal Amazonas. Purely systematic or taxonomic publications or descriptions of new species discovered on the expeditions are generally not included here, because this would involve a separate treatment. It should be mentioned, however, that the majority of taxonomic literature referring to new species discovered in the T. F. Amazonas during the last 50 years has been published in the series “Botany of the Guayana Highland,” edited by Bassett Maguire and published in the Memoirs of the New York Botanical Garden since 1953. Other examples have appeared in Fieldiana, Bulletin of the Torrey Botanical Club, Brittonia, Boletín de la Sociedad Venezolana de Ciencias Naturales, Acta Botánica Venezolana, Phytologia, and some other journals devoted to tropical American botany. In addition, local, regional, and continental “floras,” such as Flora Neotropica, Flora de Venezuela, Flora of Suriname, Flora Brasiliensis, and Proyecto Flora Amazónica, contain useful information on taxonomic results of botanical exploration undertaken in the Territorio Federal Amazonas and adjoining areas.

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MAP 1

General Geography of Territorio Federal Amazonas, Venezuela.
(Base map: CODESUR, 1975, scale 1:1,000,000.)