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DE PLANTIS TOXICARIIS E MUNDO NOVO TROPICALE COMMENTATIONES XXVI

ETHNOPHARMACOLOGICAL NOTES ON THE
FLORA OF NORTHWESTERN SOUTH AMERICA

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This series of papers has been offered in an attempt to stimulate interest on the part of pharmaceutical researchers in investigation of the wealth of ethnopharmacological knowledge of the incredibly rich flora of the northwesternmost part of South America, especially of the Amazonian sector of this region.

Botanical and ethnobotanical studies of the flora of this part of South America have been under way now for at least a century and a half. Yet it is only during the last few decades that ethnobotanical exploration and laboratory studies of the plants have been carried out from pharmacological and chemical points of view. With the highly sophisticated chemical techniques now available, it is even more imperative to take advantage of ethnobotanical knowledge of peoples who, for many millenia, have lived in close association with their ambient vegetation.

We should realize that the Plant Kingdom is vastly more complex and extensive than it was once thought to be—even as recently, for example, as in the 1920s. Some investigators now believe that there are at least half a million plant species to be investigated. Only a relatively few species of this assemblage of different chemical factories have ever been examined—and that only superficially and for specific compounds, such as alkaloids.

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It is becoming increasingly apparent that the indige materia medica of the northwestern Amazon represent untapped assemblage of plants, many of which might interest to pharmacological and phytochemical scientists. flora of the Amazon Valley—undoubtedly surpassing 7 species—represents one of the last preserves to be destroyed by man. This destruction is progressing at a prodigious rate, especially in the eastern part of the basin. With accelerated extinction of the aboriginal populations, an extensive ethnobotanical survey of lore and practice extending at least over several years will have been totally lost.

A recent—and, from several points of view, an outstanding—phytochemical study of one group of plants, based in great part on ethnopharmacological information, strongly supports the value of the interdisciplinary approach: the collaboration of a chemist and pharmacologist with the botanist and ethnobotanist. I refer to Gottlieb's recent article in the *Journal of Ethnopharmacology* (Gottlieb, O.: *Journ. Ethnopharm.* 1 (1966): 309–323). This review points out that there is chemical support for a number of the native uses of various myristicaceous plants of the Amazon as hallucinogens and arrow poisons as well as in the treatment of infected wounds and skin troubles.

Voucher specimens for the following notes are preserved in the Economic Herbarium of Oakes Ames and in the Herbarium of Harvard University, in the Herbario Nacional de Colombia, Bogotá, or in several of these institutions. Several of the collections mentioned are preserved in the New York Botanical Garden herbarium.

The families are arranged in accord with the Engler and Prantl system and the genera alphabetically under the families.

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LYCOPODIACEAE

Lycopodium cernuum Linnaeus, Sp. Pl. (1753) 1103.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, vicinity of Leticia, August 29–September 12, 1966. R. E. Schultes, R. F. Raffauf et D. S. S. 24038.

A Dragendorff spot-test for alkaloids was positive for this common species of *Lycopodium*.

Alkaloids have recently been detected in about a dozen species of Lycopodiaceae. Nicotine and quinolizidine bases account for most of the lycopodiaceous alkaloids (Tyler, V. E.: *Lloydia* 24 (1961) 58).

ARACEAE

Anthurium eminens Schott in Oestr. Bot. Wochenbl. 5 (1855) 273.

ECUADOR: Napo, Río Aguarico, Dureno. October 2, 1966. *H. V. Pinkley* 471a, 471b; June 20, 1966. *Pinkley* 288.

The Kofán names of this *Anthurium* are *insindevo-se-he* '-pa; *misisehe* '-pa; *ainsehe* '-pa.

The field notes for this aroid state merely "medicine for animals" (*Pinkley* 471a and b) and "medicine" (*Pinkley* 288.).

Anthurium Jenmanii Engler, Pflanzenr. 4, Fam. 23b (1905) 72.

ECUADOR: Napo, Río Aguarico, Dureno. June 21, 1966. *H. V. Pinkley* 290.

According to the collector, the Kofáns crush all parts of the plant in hot water and apply it to relieve "stiff neck." The native name is *caridi-se-he* '-pa.

Anthurium scolopendrinum Kunth, Enum. Pl. 3 (1841) 68.

ECUADOR: Napo, Río Aguarico, Dureno. February 22, 1966. *H. V. Pinkley* 134.

This plant is boiled, and the resulting tea is used as a mouth rinse for toothache. The Kofán name is *chipi-ri-fambi-cho*.

Anthurium tenuispadix Engler, Pflanzenr., 4, 23b (1905) 73.

ECUADOR: Napo, Río Aguarico, Dureno. June 3, 1966. *H. V. Pinkley* 245.

A gargle is prepared from the crushed leaves for treatment of sore or swollen throat. The Kofán name is *tisha-va-wo-cho-sehe* '-pa.

Caladium bicolor (Ait.) Ventenat, Jard. Cels. (1800) t. 30.

ECUADOR: Napo, Río Aguarico, Dureno. "Cultivated." June 27, 1966. *H. V. Pinkley* 333.

According to field notes, the leaf is placed in the nostrils of dogs "to make them better hunters for *saquira* (wild pig)."

***Dieffenbachia obliqua* Poeppig et Endlicher**, Nov. Gen. ac Sp. 3 (1845) 90.

ECUADOR: Napo, Río Aguarico, Dureno. January 1, 1966. *H. V. Pinkley* 88.

Field notes accompanying this specimen indicate that the plant is "poisonous to touch, causing itching." The Kofán names are *to 'vo* and *akie-ega*.

***Dracontium longipes* Engler** in Engler, Bot. Jahrb. 37 (1905) 122.

PERU: Departamento de Loreto, Ushpacano, 2 hours from Iquitos. February 2, 1968. *F. Tina et M. Tello* 2054.

This aroid is called *jergon sacha* in Amazonian Peru. The field notes accompanying the specimen read: "For snake bite. Put over the fire one teaspoon of *jergon sacha* with a little water for 2 minutes, then take off the fire and apply of the snake bite place three times a day."

***Dracontium Trianae* Engler**, Pflanzenr. 4, Fam. 23c (1911) 44.

ECUADOR: Napo, Río Aguarico, Dureno. December 30, 1965. *H. V. Pinkley* 60a, 60b. — Same locality. June 21, 1966. *Pinkley* 294.

PERU: Departamento de Loreto, vicinity of Iquitos. July 1967. *R. Martin, T. Plowman et C. Lau-Cam* 1661.

The Kofáns of Ecuador, who cultivate this aroid, know it as *shi-shi-tu-she-se-he 'pa* and boil the tuber to prepare a decoction drunk to treat diarrhoea.

In Peru, the tuber is ground into a paste and wrapped in leaves of *Calathea*. When warmed in a fire, the paste is applied to snake-bite as a plaster.

***Xanthosoma conspurcatum* Schott**, Syn. Aroid (1856) 61.

ECUADOR: Río Aguarico, Dureno. June 26, 1966. *H. V. Pinkley* 329.

The Kofáns, who call this plant *to 'vo*, assert that it is "poisonous to touch."

PONTEDERIACEAE

***Pontederia cordata* Linnaeus, Sp. Pl. (1753) 288.**

COLOMBIA: Comisaría del Putumayo, Mocoa. Camino de Herradura Antiguo y Río Rumiayaco. Alt. 700–850 m. "N. v. *amarón borrachero*" Planta acuática, Flores blancas. Se usa para quitar parálisis fasciales." October 10, 1965. *H. García-Barriga, Y. Hashimoto et M. Ishikawa 18685.*

The vernacular name *amarón borrachero* indicates that *Pontederia cordata* either possesses intoxicating principles or is employed as an additive to a narcotic preparation made basically from *Banisteriopsis Caapi*. In view of the probable lack of toxic principles in this species (Hegnauer, R.: *Chemotaxonomie der Pflanzen* 2 (1963) 419–421), the latter use is the more likely of the two possibilities.

According to the collectors, *Pontederia cordata* is employed to relieve facial paralysis, but the manner of its use is not specified.

AMARYLLIDACEAE

***Eucharis amazonica* Linden in Ill. Hort. 28 (1881) 30.**

ECUADOR: Napo, Río Aguarico, Dureno. February 7, 1966. *H. V. Pinkley 105.*

Amongst the Kofáns, the whole plant (including the bulb) is boiled and steeped to prepare an emetic tea. Pinkley reports that "this insures greater accuracy in using the blow gun while hunting monkeys." The Kofán name is *kon-si-achipa-cho*.

An alkaloid—lycorine—has been isolated from *Eucharis grandiflora* Planch. This constituent appears to be widespread in the family (Hegnauer: loc. cit. 2 (1963) 58; Raffauf, R. F.: *A Handbook of Alkaloids and Alkaloid-containing Plants* (1970).

HAEMODORACEAE

***Schiekia orinocensis* (HBK.) Meissner, Plant. Vasc. Gen. 2 (1842) 300.**

COLOMBIA: Comisaría del Putumayo, Río Sucumbios (San Miguel). April 7–8, 1942. *R. E. Schultes 3568.*

Amongst the Kofán Indians, the stem of *Schiekia orinocensis* is employed as a soap. It is known by the Spanish name *jabón* ("soap").

Nothing is known of the chemistry of *Schiekia*.

ORCHIDACEAE

Dichaea muricata (Sw.) Lindley, Gen. et Sp. Orch. Pl. (1833) 209.
ECUADOR: Napo, Río Aguarico, Dureno. 1966. H. V. Pinkley 526.

A wash prepared from this orchid is valued by the Kofán Indians for treating eye infections, probably conjunctivitis which is common in the region. The Kofán name of the plant is *shahasi-sehe* '-pa.

No chemical studies apparently have been done on *Dichaea*.

Oncidium pusillum (L.) Reichenbach fil. in Walpers Ann. Bot. 6 (1863) 714.

ECUADOR: Napo, Río Aguarico, Dureno. 1965. H. V. Pinkley 11.

The Kofán Indians of the Colombo-Ecuadorian part of the westernmost Amazon treat lacerations with a wash prepared by boiling this plant in water. The Kofáns call the plant *atii* '-pa *kashaikie-si-sehe* '-pa.

Oncidium pusillum has apparently not been chemically studied.

Recently a new name for this well known orchid has been proposed: *Psygmorchis pusilla* (L.) Dressler et Dodson. Believing that this new genus *Psygnorchis* is based upon trivial characters, I prefer to employ the widely and time-honoured binomial *Oncidium pusillum*.

Phragmipedium ecuadorensis Garay in Harling et Sparre, Fl. Ecuad., Orch., no. 9, pt. 1 (1979) 15.

ECUADOR: Napo, Río Aguarico, between Dureno and Santa Cecilia. "Growing on vertical cliff about 8 ft. above river. Flower greenish. Plant extremely rare, according to the Kofáns." November 1966. H. V. Pinkley 553.

This orchid is boiled in water to prepare a tea taken for "stomach trouble." The Kofán names are *shatifa-se* 'he' '-pa and *topa-sé-he* '-pa.

MORACEAE

Pourouma Cucura Standley et Cuatrecasas in Fieldiana, Bot. 28, no. 1 (1951) 211.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Soratama (above mouth of Río Kananarí) and vicinity. January 1952. R. E. Schultes et I. Cabrera 19835.

The bark of *Pourouma Cucura* is boiled for several hours in water to prepare an infusion which is vigorously rubbed on aching joints and other areas of the body affected with rheumatic-like pains and swellings. This practice is common amongst the Taiwano Indians of the Río Kananarí, who know the plant as *ma-he 'ne-ka-pa*.

There appear to have been no chemical studies made of the genus *Pourouma*. The major importance of the genus to the Indians of the northwest Amazon centers on *P. cecropiaefolia* Martius, a cultivated tree yielding an edible grape-like fruit.

PIPERACEAE

Lepianthes umbellatum (L.) Rafinesque, Sylv. Tellur. (1838) 84.

Pothomorphe umbellata (L.) Miquel, Comm. Phyt. (1840) 36.

COLOMBIA: Comisaría del Putumayo, Río Guamütés, San Antonio. "Secondary growth. Herb 5-6 feet." September 5, 1966. H. V. Pinkley 421.

The Kofán Indians prepare an arrow poison of this plant alone (the bark of the lower stem and root is scraped and boiled) or mixed with other plant ingredients, especially for hunting monkeys and wild pigs. The Kofán name is *a-nama-he-se-he 'pa*.

This species has been employed as a strong diuretic in Brazil (Peckholt, T.: *Pharm. Rundschau* 12 (1894) 240, 285).

There appears to be no chemical constituent which would make the bark active as an ingredient of curare. Many piperaceous plants are employed as minor ingredients in preparing curares, but they are believed not to have themselves any active curare constituents. The report that *Lepianthes umbellatum* may be used with no admixtures as an arrow poison plant consequently acquires special significance.

The binomial *Pothomorphe umbellata* is more widely known as the name of this plant. The use of the generic epithet *Lepianthes* has been recently discussed by Howard (Howard, J. A.: *Journ. Arn. Arb.* 54 (1973) 380 ff.).

***Peperomia glabella* (Sw.) A. Dietrich var. *melanostigma* Dahlstedt** in Kgl. Sv. Vet. Akad. Handl. 33, pt. 2 (1900) 12

COLOMBIA: Comisaría del Putumayo, Mocoa and vicinity. December 3-1942. R. E. Schultes et C. E. Smith 2959.

This herb is a supposed remedy for conjunctivitis when applied in the form of a decoction (Schultes: *Rhodora* 77 (1975) 165). It is widely used in the region of Mocoa, where this eye infection is often epidemic. The plant is locally known as *tre-gwen* in the Ingano-language and *flor de mal* in Spanish.

***Peperomia macrostachya* (Vahl.) Dietrich var. *nematostachya* (Link.) Trelease et Yuncker**, *Piperac. N. S. Am.* 2 (1950) 66

COLOMBIA: Comisaría del Vaupés, Río Kananari, Cerro Isibukuri. "Epiphyte." March 8, 1951. R. E. Schultes et I. Cabrera 13260. — Río Vaupés, Mocoa and vicinity. R. E. Schultes, R. F. Raffauf et D. Soejarto 24178.

The leaves of this climbing epiphyte are boiled, and the resulting tea is taken by elderly members of the Taiwano tribe to relieve difficulty in urinating. It is also said to be an effective febrifuge.

A Dragendorff spot test for alkaloids (Schultes, Raffauf et Soejarto 24178) was negative.

***Peperomia serpens* (Sw.) Loudon**, *Hort. Brit.* (1830) 13.

COLOMBIA: Comisaría del Putumayo, Río Sucumbios, Santa Rosa. April 7-1942. R. E. Schultes 3589.

The aromatic leaves and stems of this shrub are locally employed crushed and applied as a poultice to relieve the irritation and painful sting of the large conga ant (*Dinoponera grandis*). The Kofán Indians call the plant *oo-nov-se 'he 'pa*.

***Piper Hostmannianum* (Miq.) C. DeCandolle** in *DeCandolle Prodr.* 16, pt. 1 (1869) 287.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, vicinity of Leticia. "Small bush. Leaves aromatic." August 29–September 12, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24018.*

In the Leticia region, a poultice of the crushed leaves is applied to warts in the belief that this hastens their disappearance. The plant is known as *cordoncillo*, a name applied to many species of *Piper* in reference to the inflorescence (*cordoncillo* = "shoe string").

***Piper interitum* Trelease ex Macbride** in *Field Mus. Publ. Bot.* 13 (1936) 176.

PERU: Departamento de Loreto, Zapote, upper Río Purús. "Tree about 10 meters high. Lowland Forest." October 15, 1968. *L. Rivier 21.*

The Kulina Indians of eastern Peru, who call this plant *tetsi*, prepare a snuff from the dried leaves and roots. It is used as a "substitute" for tobacco.

There are indications from several native uses of species of *Piper* that the essential oils in this genus may have psychoactive properties.

***Piper Schultesii* Yuncker** in Trelease and Yuncker, *The Piperaceae of Northern South America* (1950) 34.

COLOMBIA: Comisaría del Vaupés, Confluence of Ríos Macaya and Ajaju, Cerro Chiribiquete. May 15–16, 1943. *R. E. Schultes 5416.*

The Karijona Indians value this species, which they call *ooka'-ña-te*, in the treatment of bronchial ailments, most of which seem to be tuberculosis. A hot tea of the leaves and stem is drunk over a period of many days. This tea is a strong diuretic. Special trips are made to Chiribiquete and similar sandstone mountains in the area to procure leaves of the plant which are kept in dry condition for use; they conserve a strong pungency for many months.

POLYGNACEAE

***Rumex obtusifolius* Linnaeus, Sp. Pl.** (1753) 335.

COLOMBIA: Comisaría del Putumayo, Valle de Sibundoy, Sibundoy. Alt. 2225–2300 m. May 29, 1946. *R. E. Schultes et M. Villarreal 7610.*—Same

locality. "*Lengua de vaca*." February 20, 1963. *P. J. Chindoy B.* 97. — Same locality. "Garden and waste places, very frequent. One or two most persistent, most frequent weeds in valley." April 1, 1963. *M. L. Bristol* 704. — Same locality. "*Lengua de vaca*. Open pasture; infrequent." May 8, 1963. *M. L. Bristol* 969.

The Kamsá Indians of Sibundoy employ the roots of *Rumex obtusifolius* in decoction as a strong laxative.

The roots contain 1,8-dihydroxynaphthaline (Hesse, O.: *Ann. Chem.* 305 (1896) 291).

MYRICACEAE

Myrica parvifolia *Benth*am, *Pl. Hartw.* (1846) 251.

COLOMBIA: Departamento de Cundinamarca, Bogotá, Cerro above La Cita. May 10, 1946. *R. E. Schultes* 7111.

Bundles of the leaves and stems of this shrub are burned in huts of people living in the cool, humid highlands around Bogotá for the aromatic smoke which is believed to relieve congestion caused by the frequent pulmonary troubles of these people. This folk medicine use may perhaps be based on the presence of essential oils in the plant.

Leucoanthocyanines have been detected in one species of *Myrica* (Gibbs: *Chemotaxonomy of Flowering Plants* 3 (1974) 1396).

MENISPERMACAE

Abuta splendida *Krukoff et Moldenke* in *Bull. Torr. Bot. Club* 68 (1941) 241.

COLOMBIA: Comisaría del Amazonas, Río Miritiparaná, affluent of Río Guacayá, uppermost reaches. May 21, 1952. *R. E. Schultes et I. Cabrera* 16569.

The bark of the stem of this liana is the principal component of one of the arrow poisons prepared by the Yukuna Indians. The name of the plant in Yukuna is *wy-ya-pee'-ta*, in Tanimuka *nee-koo'-pa-roo*.

Curarea tecunarium *Barneby et Krukoff* in *Mem. N. Y. Bot. Gard.* 22 (2) (1971) 12.

BRAZIL: Estado do Amazonas, Río Cunhuá, Deni Indian village. November 28, 1971. *G. T. Prance, P. J. M. Maas, D. Woolcott et al. 16453.*

COLOMBIA: Comisaría del Putumayo, Río Guamùès, Salvador. "Arrow poison." August-September 1963. *C. Naranjo et G. Wiederhold 16.* Comisaría del Vaupés, Río Macaya, vicinity of Cachivera del Diablo. "Said to have been used formerly by Karijona Indians in arrow poisons. Vine. Fruits yellow, very bitter." May 1943. *R. E. Schultes 5526.* — Río Macu-Paraná, lowland forest. "Root scrapings are used in preparing arrow poison mixture by Bara-Makú. *Awa-puh* (species of monkey root)." June 1-8, 1970. *P. Silverwood-Cope 23.*

Curarea tecunarium is well recognized as one of the principal sources of an especially strong curare in the northwestern Amazon. Its use as a contraceptive, however, is not widely known. According to *Prance, Maas, Woolcott et al. 16453*, the stem is crushed and placed in water, stirred and taken as a contraceptive by the Deni Indians of Brazil who call the plant *bekú*.

Telitoxicum peruvianum Moldenke in *Brittonia* 3 (1938) 45.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná, Caño Teemeña (Lobo Igarapé). "Small tree. Fruit dark green. Barasana: *bo-de 'mee-see*." September 10, 1952. *R. E. Schultes et I. Cabrera 18340.*

The Makuna Indians valued *Telitoxicum peruvianum* as an important ingredient of the curare that formerly was prepared by medicine men of this tribe. The Barasana believe that application of crushed leaves to ulcers and similar infections aids in cleansing the wounds and hastens healing.

ANNONACEAE

Anaxagorea sp.

ECUADOR: Napo, Río Aguarico, Dureno. "Tree." December 12, 1965. *H. V. Pinkley 16.* — Same locality. "Small tree, 6-8 feet." October 19, 1966. *Pinkley 522.*

The bark of the root of this treelet is an ingredient of curare amongst the Kofáns. The Kofán name is *ko-yo-vi-fa-nti*.

Cyanogenesis is reported from a Philippine species of *Anaxagorea* (Hegnauer: loc. cit. 3 (1964) 121).

Guatteria Duckeana *R. E. Fries* in *Acta Horti Berg.* 12 (1939) 468.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cachivera de Tatú. "Tree 4 feet. Flowers green." October 10, 1966. R. E. Schultes, R. F. Raffauf et I. Soejarto 24377.

All parts of this plant tested very positive for alkaloids with Dragendorff reagent.

Gutteria dura R. E. Fries in Acta Horti Berg. 12 (1939) 499.

COLOMBIA: Comisaría del Vaupés, Río Kuduyari. "Tree 18 feet. Flower yellow-green, cauliflorous." October 10, 1966. R. E. Schultes, R. F. Raffauf et I. Soejarto 24391.

The Kubeos formerly employed this plant in a formula for making curare.

With Dragendorff reagent, the bark tested highly positive for alkaloids, the leaves slightly positive.

Several alkaloids have been reported from the genus *Gutteria* (Raffauf: loc. cit. (1970)).

Unonopsis veneficiorum (Mart.) R. E. Fries in Acta Hort. Berg. 12 (1939) 238.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná. Right tributary of Río Macú-paraná. June 1-8, 1970. P. Silverwood-Cope 11. — Río Apaporis basin Río Pacoa. February 7-12, 1952. R. E. Schultes et I. Cabrera 15269.

The nomadic Makú Indians of the Río Piraparaná have an extensive ethnopharmacopoeia. They indicate that *Unonopsis veneficiorum* is employed as an antifertility agent. Its name in Makú—*we-wit-kat-ku'*—means "no children medicine." No further information, unfortunately, is available concerning method of preparation and use.

The Barasana Indians of the Apaporis basin employ the root and bark of the lower stem in the preparation of an arrow poison. This report (Schultes: *Bot. Mus. Leaflet, Harvard Univ.* 25 (1977), 114) represents apparently the third concerning the role of the plant in curare. The Puinaves, a number of whom migrated into the Río Apaporis area, were not aware of this use of *Unonopsis veneficiorum*, even though they know the plant and look upon it as "dangerous"; the Puinave name is *choon*.

This annonaceous species apparently is rather widely utilized in the Colombian Amazon as the basis of a curare. The first report was published by von Martius (Spix, J. B. et K. F. D. Martius: *Reise in Brasilien* (1831) 1237) who stated that Indians

in the Japurá or Caquetá valued it for this purpose. The second report (in Schultes, R. E.: *Bot. Mus. Leaflet, Harvard Univ.* 22 (1969) 134-136) placed its use amongst the Kofán Indians along the border between Colombia and Ecuador on the basis of the collection *Pinkley 558*.

It is suspected that *Unonopsis veneficiorum* contains bis-benzylisoquinoline alkaloids (Hegnauer: loc. cit. 3 (1964) 118).

Xylopia amazonica R. E. Fries in *Acta Horti Berg.* 12 (1939) 562.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. "Large tree. Flowers white. High land." September 28, 1951. R. E. Schultes et I. Cabrera 14146.

Xylopia amazonica is valued by the Indians of the Río Apaporis in the form of a tea to induce sleep. The leaves and stems are employed.

Alkaloids, polyphenols and essential oils have been reported from *Xylopis* (Hegnauer: loc. cit. 3 (1964) 118, 120; Raffauf: loc. cit. (1970)).

Xylopia aromatica (Lam.) Martius, *Fl. Bras.* 13, pt. 1 (1841) 43.

COLOMBIA: Comisaría del Amazonas, Río Igaraparaná, La Chorrera. June 4-10, 1942. R. E. Schultes 3951. Comisaría del Vaupés, Río Vaupés, Urania. "Fruit red-purple. Small tree." September 27-October 20, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24393.

This plant is strongly positive with a Dragendorff alkaloid test (Schultes, Raffauf et Soejarto 24393).

Amongst the Witotos of the Río Igaraparaná, *Xylopia aromatica* is valued in the form of a weak tea as a strong diuretic used in cases of swellings of the legs. It must, according to the Indians, be administered with great caution.

Xylopia Benthamii R. E. Fries in *Kgl. Sv. Vet.-Akad. Handl.* 34, No. 5 (1900) 35.

COLOMBIA: Comisaría del Vaupés, Río Kananarí, Cerro Isibukuri. Alt. 2500 feet. "Small tree. Pods white and red. Forest on slope near summit." December 4, 1951. R. E. Schultes et I. Cabrera 14751.

According to the Taiwanos of the Río Kananarí, a tea of this plant is administered as a tranquilizer to people who have experienced a great fright.

The similarity in uses of *Xylopia amazonica* and *X. Benthamii*—to induce sleep and as a tranquilizer, respectively—suggests the advisability of chemical and pharmacological research.

MYRISTICACEAE

***Osteophloem platyspermum* (Poepp.) Warburg** in Nova Act Acad. C. L. C. G. Nat. Cur. 68 (1897) 162.

BRAZIL: Estado do Amazonas, basin of Rio Negro, Rio Uneixi Makú India village 300 km. above mouth. "Forest on terra firme. Tree, 25 m × 40 cm diameter. Flowers green. Sap drunk by Makú as cure for coughs and cold. Makú = *tugnebãnye*." October 23, 1971. G. T. Prance, P. J. M. Maas, D. I. Woolcott, O. P. Monteiro et J. F. Ramos 15571. — Rio Negro, vicinity of Manáos, Reserva Ducke. April 11–14, 1972. R. E. Schultes et W. Rodrigue 26126a.

The Makú drink the sap as a "cure for coughs and colds. Labourers in the Reserva Ducke near Manáos burn the leaves and inhale the smoke to relieve asthmatic conditions.

Chemical studies of *Osteophloem* apparently have not been effected.

CHRYSOBALANACEAE

***Licania apetala* (E. Mey) Fritsch** in Ann. K. K. Naturh. Hofmus. Wien 4 (1889) 54.

COLOMBIA: Comisaría del Vaupés, Rio Kananarí, Cerro Isibukuri. "Tree diameter 15 inches, height 75 feet." March 8, 1951. R. E. Schultes et I. Cabrer 13276.

The bark of this tree is burned, and the ashes are mixed with clay for making pots. The tree is known locally in Spanish as *cabio*. Its Indian names are: Kabuyarí—*ka'-ve*; Kuripako—*ka'-be*; Taiwano—*hna-mwa*; Puinave—*wan-choo'*.

LEGUMINOSAE

***Acosmium nitens* (Vog.) Yakovlev** in Notes Roy. Bot. Gard. Edinb. 29 (1969) 353.

BRAZIL: Estado do Amazonas, Rio Negro, Tapurucuara. "Flowers white. Small tree. Bark very alkaloid-positive; petiole and leaf negative." July 5–August 12, 1967. R. E. Schultes 24550 (Alpha Helix Amazon Expedition 1967).

The bark of this tree was indicated as an ingredient of curare made in former times by the Tukano Indians.

Nothing is known of the chemistry of this genus.

Brownea Ariza Benth, Pl. Hartw. (1845) 171.

COLOMBIA: Comisaría del Putumayo, Buena Vista. "Flower bright red. Tree 10-12 feet tall. *Palo cruz*." September 13, 1972. *F. Piaguaje* 11.

According to the anthropologist Dr. Jean Langdon, the flower is prepared in a tea and used as a "vomitivo" to cure bleeding and excessive menstruation.

Campsiandra angustifolia Spruce ex Benth in Martius, Fl. Bras. 15, pt. 2 (1870) 55.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Flowers bright red, fragrant. Bush 9-10 feet." September 27-October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24297.

PERU: Departamento de Loreto, Iquitos region, San Antonio, Río Itaya. "*Huacapurana*. Large tree, 30 m in wet forest." July 30, 1966. *R. T. Martin et C. A. Lau-Cam* 1189.

The leaves of this plant are alkaloid negative with Dragendorff reagent.

According to the collectors of *Martin et Lau-Cam* 1189, in the Iquitos region an infusion or alcohol extract is taken twice a day for malaria.

No chemical studies of this genus have been reported.

Campsiandra laurifolia Benth ex Hooker, Journ. Bot. 2 (1840) 94.

PERU: Departamento de Loreto, Provincia Maynas, Río Ampiyacu, Pebas and vicinity. "Forest near Pebas. Tree 10 m tall. Buds green. *Huacapurana*." April 23, 1977. *T. Plowman, R. E. Schultes et O. Tovar* 6990 (Alpha Helix Amazon Expedition 1976-1977, Phase VII).

The bark of this small tree is employed in infusion by the Witoto Indians to treat wounds.

Cassia fruticosa Miller var. Benth *miana (Harms) Macbride* in Field Mus. Publ. Bot. 13, pt. 3 (1943) 165.

ECUADOR: Napo, Río Aguarico, Dureno. "Small tree 25 m; flowers pale yellow; leaflet pairs fold in evening. Kofán: *kongi-hi*." May 22, 1966. *H. V. Pinkley* 177.

The bark of the twigs is prepared in a hot tea which is valued in treating earache.

Several alkaloids have been reported from *Cassia* (Raffauf: loc. cit. (1970)), and cyanogenic glycosides have been indicated from several species (Gibbs: loc. cit. 3 (1975) 1630).

***Cassia macrophylla* Kunth**, Mimos. (1819) 126, t. 38.

ECUADOR: Napo, Río Aguarico, Dureno. "Kofán: *kongihiteta*." February 23, 1966. H. V. Pinkley 154.

According to the collector, the Kofán Indians use a wash prepared from this plant for earache and headache.

***Cassia Ruiziana* Vogel**, Syn. Cass. (1837) 40.

ECUADOR: Napo, Río Aguarico, Dureno. "Kofán: *kongihisehépa*." June 23, 1966. H. V. Pinkley 341.

The bark of the branches is scraped into hot water to prepare a wash which the Kofáns use in treating earache, according to the collector.

***Crudia amazonica* Spruce ex Benth** in Martius, Fl. Bras. 15, pt. 2 (1870) 238.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. September 27–October 20, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24192.

The bark of this small tree is boiled to prepare a tea taken for emesis following food poisoning. The plant is alkaloid-negative. The genus *Crudia* is chemically unknown.

***Diploptropis Martiusii* Benth** in Ann. Wien. Mus. 2 (1838) 88.

COLOMBIA: Comisaría del Vaupés, Río vaupés, Mitú and vicinity, Cachivera de Tatú. September 27–October 30, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24389.

Among the Kubeo Indians, who call this plant *ko-ma'-ma*, the leaves were formerly burned to make an ash mixed with powdered leaves of coca (*Erythroxylon Coca* Lam. var *Ipadu* Plowman). They also mix the dried leaves powdered with *fariña* to ingest when there is blood in the stool. The leaves are alkaloid negative with a Dragendorff spot test.

Heterostemon mimosoides *Desfontaines* in Mem. Mus. Paris 4 (1818) 248.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small tree or bush. Flowers purple. Alkaloid-negative." September 27-October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24171.*

The flowers are said formerly to have been pulverized and used for flavoring *chicha*. The bark of this tree is alkaloid-negative with Dragendorff reagent.

Nothing is known of the chemical composition of *Heterostemon*.

Inga stenoptera *Benth* in Hooker, Journ. Bot. 2 (1840) 143.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Flowers white. Common bush along water's edge." September 27-October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24256.*

The Kubeos call this plant *to-to'-ko*. The leaves and bark are alkaloid-negative with Dragendorff reagent.

Macrolabium acaciaefolium (*Benth.*) *Benth* in Martius, Fl. Bras. 15, pt. 2 (1870) 224.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, near mouth of Río Loretoyacu and Puerto Nariño. "Tree 60 feet. Fruit round, green." September 13-15, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24142.*

The powdered leaves are used medicinally amongst the Tikunas to sprinkle on ulcerated wounds. The tree is known as *ma-ta'-ke*.

Chemical studies of *Macrolabium* have apparently not yet been made.

Macrolabium multijugum (*DC.*) *Benth* in Martius, Fl. Bras. 15, pt. 2 (1870) 222.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. September 27-October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24183.*

This spreading tree with brownish red flowers is alkaloid-negative. Some of the Indians living near Mitú state, however, that the fruits are poisonous.

***Pterocarpus Rohrii* Vahl, Symb. Bot. 2 (1791) 79.**

COLOMBIA: Comisaría del Amazonas, Río Amazonas, near mouth of Río Loretoyacú and Puerto Nariño. September 13-15, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24163.

The leaves of *Pterocarpus Rohrii* are held to be one of the most effective febrifuges of the area. They are taken in decoction.

Pterocarpus has not yet chemically been investigated.

***Swartzia longistipitata* Ducke in Bol. Técn. Inst. Agron. Norte, no. 2 (1944) 22.**

BRAZIL: Estado do Amazonas, Rio Negro, vicinity of Manáos, grounds of I.N.P.A. "Fruit tan." April 11-14, 1972. R. E. Schultes et W. Rodrigues 26104A.

The people living in the country around Manáos are accustomed to use an infusion of the leaves as an anti-amenorrheal bath. The plant is known in Portuguese as *coquida*.

For a review of the limited amount of chemical information on *Swartzia*, see Schultes: *Journ. Ethnopharm.* 1 (1979) 79 ff.

***Swartzia recurva* Poeppig et Endlicher, Nov. Gen. et Sp. 3 (1845) 61.**

BRAZIL: Estado do Amazonas, Rio Negro, vicinity of Manáos, km 45 Manáos-Caracarl, Reserva Biologica INPA. "Small tree. Fruit tree." April 11-14, 1972. R. E. Schultes et W. Rodrigues 26173A.

Country folk in the outskirts of Manáos believe that the fruits of this species are helpful in combatting physical debilitation due to age, malaria or other conditions. The pods are boiled and softened and added to regular food.

***Swartzia sericea* Vogel in Linnaea 11 (1837) 176.**

BRAZIL: Estado do Amazonas, Rio Negro, vicinity of Manáos, Cachoeira Baixa de Tarumão. April 11-14, 1972. R. E. Schultes et W. Rodrigues 26146A.

The leaves of this species are considered to be toxic and were formerly employed in fishing in the outskirts of Manáos. It may be significant that the Kuripako Indians of the Río Guainía of Colombia report also that the leaves and bark were formerly used as a fish poison (Schultes: loc. cit. 86).

Tachigalia cavipes (*Spr. ex Bth.*) Macbride in Field Mus. Publ. Bot. 13, pt. 3 (1943) 127.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Jerijerimo. July 8, 1951. *R. E. Schultes et I. Cabrera 12981*. — Río Kananari. September 29, 1951. *Schultes et Cabrera 14690*. — Río Vaupés, Mitú and vicinity. *H. Garcia-Barriga, R. E. Schultes et H. Blohm 16061*. Comisaría del Amazonas, Río Miritiparaná. May 8, 1952. *Schultes et Cabrera 16463*. Comisaría del Vaupés, Río Apaporis, Raud al Yayacopi. August 18, 1952. *Schultes et Cabrera 16963*. — Río Apaporis, Jinogojé. August 22, 1952. *Schultes et Cabrera 26997*. — Río Piraparaná, middle course. October 1, 1952. *Schultes et Cabrera 17137*. — Río Vaupés, near Mitú. November 13, 1952. *Schultes et Cabrera 18409*. — Río Piraparaná. June 1-8, 1970. *P. Silverwood-Cope sine num.*

The Bara Makú Indians of the Río Piraparaná, a poorly known nomadic group with an extensive knowledge of plant medicines, call this plant *wewitkatú* ("no children medicine") and use it as an antifertility agent. There is no indication of how the plant is employed.

The anthropologist, Silverwood-Cope, collected with the same native name and the same antifertility use two different plants: *Unonopsis veneficiorum* (see above) and *Tachigalia cavipes*. It is possible that the Bara-Makú do have the same name for these two plants if the two are similarly used; it may also be possible that these Indians employ the two plants together for antifertility purposes.

Various tribes in the vicinity of Mitú use the powdered bark to "dry up" cankers of the mucous membrane of the mouth caused presumably by excessive use of coca. The Yukunas of the Río Miritiparaná value a tea of the leaves rubbed vigorously on swollen joints (arthritis?) as an anti-inflammatory.

This well known plant is called *hoo-be '-geen* ("flower of fierce ants") by the Makunas; *muin, muin-wan -shee '-pe-no* by the Puinaves; *ka-roo '-wo* by the Yukunas; and *wa-we -ra* by the Barasanas.

There is no chemical information on constituents of this interesting genus.

Tachigalia myrmecophila (*Ducke*) *Ducke* in Arch. Jard. Bot. Rio Jan. 3 (1922) 91.

COLOMBIA: Comisaría del Vaupés, Río Negro at confluence of Ríos Guainía and Casiquiare, Caño Ducuruapo. "Large tree along river bank. Flowers yellow." December 13-17, 1947. *R. E. Schultes et F. López 9389.*

The powdered bark is considered by the Kuripako Indians to be antiseptic for ulcerated sores. An infusion of the leaves is rubbed on painful limbs and causes a warmth which is said to relieve aches.

***Tachigalia paniculata* Aublet**, *Hist. Pl. Guian. Franç.* 1 (1775) 372, t. 143, f. 1.

COLOMBIA: Comisaría del Amazonas, Río Loretoyacu. September 1946. *R. E. Schultes 8266.* Comisaría del Vaupés, Río Apaporis, Jinogojé. July, 1952. *R. E. Schultes et I. Cabrera 1979b.*

Amongst the Makunas of the Río Apaporis, the leaves of *Tachigalia paniculata* are boiled, and the hot infusion is rubbed on aching limbs.

***Tachigalia ptychophysca* Spruce ex Benth** in *Martius, Fl. Bras.* 15, pt. 2 (1870) 229.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Jerijerimo. "Tree 12 m high. Petals yellow, stamens white." July 7, 1951. *R. E. Schultes et I. Cabrera 12955.*

The Taiwano Indians of the Río Kananarí value an infusion of the leaves to alleviate chest pains when it is rubbed vigorously over the ribs.

***Zornia leptophylla* (Benth.) Pittier** in *Bol. Soc. Venez. Cienc. Nat.* 6 (1940) 192.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small herb. Flowers yellow. Common: Open patch." September 27-October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24408.*

The leaves and stems dried and pulverized are employed in the Mitú area as an insect repellent. The plant is alkaloid-negative.

OXALIDACEAE

***Oxalis lotooides* Humboldt, Bonpland et Kunth**, *Nov. Gen. et Sp.* 5 (1821) 187.

COLOMBIA: Comisaría del Putumayo, Valle de Sibundoy. Alt. 2225-2300 m. May 29, 1946. *R. E. Schultes et M. Villarreal 7607.*

The Kamsá Indians prepare a decoction of this plant which is taken as a gargle to relieve chest and throat pains.

It is perhaps significant that the leaves of another species of this genus, the Amazonian *Oxalis Martiana* Zucc., are used in Brazil in the form of a gargle to relieve pains of angina (LeCointe: *A Amazonia Brasileira* 3 (1934) 108).

Leucoanthocyanines have been reported from some species of *Oxalis* (Bate-Smith, E. C.: *Journ. Linn. Soc. London (Botany)* 58 (1962) 95-173).

POLYGALACEAE

Polygala sp.

ECUADOR: Napo, Río Aguarico, Dureno. 1966. *H. V. Pinkley* 226.

A cold-water infusion is drunk for "pains around the heart" by the Kofán Indians of the Río Aguarico in Ecuador. The plant is known by these natives as *ka-ta-pa-si-vi-sehe* '-pa.

VOCHYSIACEAE

Qualea acuminata *Spruce ex Warming* in Martius, Fl. Bras. 13, pt. 2 (1875) 40.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small tree. Flowers white and pink." September 27-October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24177.

This plant tests alkaloid-negative with Dragendorff reagent. A tea of the bark is valued as a taenifuge in the Mitú area.

The literature has no report on the organic constituents of *Qualea*.

EUPHORBIACEAE

Croton glabellus *Linnaeus*, Syst. Ed. 10 (1759) 1275.

COLOMBIA: Comisaría del Amazonas, near mouth of Río Loretoyacú and Puerto Nariño. "Fruit green. Small tree." September 13-15, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24149.

Witoto Indians living in the vicinity of Leticia crush leaves of this tree to poultice infected cuts and sores.

Croton glabellus has been reported to be alkaloid-positive (Haynes, L. J. et K. L. Stuart: *Journ. Chem. Soc.* 1963 (1963) 1784, 1789). The genus appears to be relatively well furnished with alkaloids (Raffauf: loc. cit. (1970); Gibbs: loc. cit. 3 (1974) 1353, 1359).

Croton palanostigma Klotsch in Hooker Lond. Journ. Bot. 2 (1843) 48.

BRAZIL: Estado do Amazonas, Rio Negro, vicinity of Manaus, Reserva Ducke. "Small tree. Flowers white." April 11-14, 1972. R. E. Schultes et W. Rodrigues 26124a.

The sap of this tree is applied to ulcers and boils to reduce pain.

Euphorbia sp.

Amongst the Kofáns, the latex of this *Euphorbia* is put into infected cracks in the skin on the bottom of the feet—an infection caused probably by fungal organisms. The Kofán name is *shi-vak-o-sehe 'pa* (H. V. Pinkley 42, cited in Pinkley: *The Ethnobotany of the Kofán Indians*. Unpublished Ph.D. thesis, Harvard University (1973) 217).

Mabea nitida Spruce ex Benth in Hooker, Kew Journ. 6 (1854) 367.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Tree 20 feet. Fruit rusty. Alkaloid: negative." September 27-October 20, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24170.

According to Kubeo informants, the oil extracted from the seeds was in former times rubbed into the scalp to prevent or delay loss of hair.

The genus *Mabea* has not been chemically investigated.

SAPINDACEAE

Paullinia Yoco R. E. Schultes et Killip ex Schultes in Bot. Mus. Leafl., Harvard Univ. 10 (1942) 302.

COLOMBIA: Comisaría del Putumayo, Río Putumayo, Remanso. August 22, 1966. H. V. Pinkley 380.

ECUADOR: Napo, Río Aguarico, Dureno. January 3, 1966. Pinkley 72. — Río Aguarico, Pisorini, June 22, 1966. Pinkley 311. — Same locality and date. Pinkley 312. — Río Aguarico, Dureno. September 6, 1966. Pinkley 428.

Employed widely in the Colombian Putumayo and adjacent Ecuador as a caffeine-rich stimulant, yoco apparently is represented by several ecotypes, recognized by the natives and given names but to the botanist seemingly indistinguishable. More field work and more meticulous studies of the liana are required before a complete understanding of the variants known in the native pharmacopoeas is available.

According to the collections cited above, the Kofán Indians recognize two ecotypes under the names *to-to-oo-yoko* ("white yoco") and *cu-i-yoko*. Pinkley 380 indicates that *totoayoko* "has more *leche* [latex] than other types of yoko, therefore is the best type."

Serjania sp.

Crushed leaves of this *Serjania* are dried and applied to sores of the mouth by the Kofáns of Ecuador. The Kofán name of this medicinal plant is *si-si-pak-opifa-sehe* '-pa (H. V. Pinkley 220 and 420, cited in Pinkley: loc. cit.).

Saponins and pyrrolizidine alkaloids have been reported from the genus *Serjania* (Gibbs: loc. cit. 3 (1974) 1708, 1710).

BALSAMINACEAE

Impatiens sp.

An infusion of the flowers is taken internally for sore throat by the Kofáns of Ecuador (H. V. Pinkley 447 and 1973, cited in Pinkley: loc. cit.) The Kofán name is *carakuchu-sehe* '-pa.

Polyphenols and naphthoquinone are reported from the genus *Impatiens* (Hegnauer: loc. cit. 3 (1964) 229-231).

STERCULIACEAE

Herrania Camargoana R. E. Schultes in Bot. Mus. Leaflet, Harvard Univ. 14 (1950) 120.

BRAZIL: Estado do Amazonas, Rio Cauaburí, Maturacá. "Single slender trunk. Height 20 ft. In flood forest. Fruit brownish red with fleshy pseudospines at junction of ribs and cross ridges. Alkaloid negative." July 5-August 12, 1967. R. E. Schultes 24572 (Alpha Helix Amazon Expedition, 1967).

The bitter seeds of *Herrania Camargoana* are pulverized and employed as a condiment on game-meat by the Waika Indians of the Rio Cauaburi in northwestern Brazil.

***Herrania Mariae* (Mart.) Decaisne ex Goudot** in Ann. Sci. Nat. 3, 2 (1844) 233.

PERU: Departamento Loreto, Provincia Maynas, Rio Ampiyacu, Puca Urquillo and vicinity. "Unbranched tree 5 m tall in open thicket. Flowers cauliflorous. Sepals purplish brown. Petals cream with red nerves. Staminodes foliose, red-purple." April 2, 1977. T. Plowman, R. E. Schultes et O. Tovar 6565 (Alpha Helix Amazon Expedition 1976-77 Phase VII).

Although this species is to be expected in the area, it apparently represents only the second collection from Peru. The other collection was made in the Madre de Dios.

BOMBACACEAE

***Bombax globosum* Aublet**, Hist. Pl. Guian. Franç., 2 (1775) 701, t. 281.

COLOMBIA: Comisaría del Vaupés, Rio Kananari, Cerro Isibukuri. "Large tree, 60-70 feet tall. Flowers yellow-white, petals yellow towards tip." September 29, 1951. R. E. Schultes et I. Cabrera 14700.

The Taiwano Indians, who know this tree as *ka-ne-wee'-re*, gathered the "wool" from the ripened fruits for use, mixed with latex or resin from a number of plants, to apply to cuts, open sores or ulcers as a kind of protection during healing.

MARCGRAVIACEAE

***Souroubea guianensis* Aublet var. *corallina* (Mart.) Wittmack** in Martius, Fl. Bras. 12, pt. 1 (1878) 252.

COLOMBIA: Comisaría del Amazonas, Rio Apaporis, vicinity of Cachivera de Jerjerimo. September 16, 1951. R. E. Schultes et I. Cabrera 14076.

The Taiwano Indians living along the Rio Kananari indicate that a decoction of this plant is administered over a period of a week or ten days to aged members of the tribe who suffer from "susto" (i.e., a psychological condition of fear or apprehension resulting often from the belief that hexing by an enemy has been successful).

Little is known of the chemistry of the Marcgraviaceae. Tannins and leucoanthocyanins have been reported from some species of *Marcgravia* (Gibbs: loc. cit. 3 (1974) 1371).

Souroubea guianensis Aublet var. cylindrica Wittmack in Martius, Fl. Bras. 12, pt. 1 (1878) 253.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Circasia. Sandy savannah, quartzite base. Alt. about 800 feet. "Fruit brown." April 20, 1953. *R. E. Schultes et I. Cabrera 19214*. — Same locality. "Flowers orange-red." November 1953. *R. E. Schultes et I. Cabrera 19697*.

The Karijona Indians residing in the upper Río Vaupés value a tea of the leaves of this plant as a tranquilizing medicine.

Souroubea pachyphylla Gilg in Engler, Bot. Jahrb. 25 Beibl. 60 (1898) 33.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, Leticia. January 28–February 7, 1969. *T. Plowman, T. Lockwood, H. Kennedy et R. E. Schultes 2318*.

From the dried leaves, the Witoto Indians living near Leticia (who originally came from the Río Igaraparaná) prepare a pomade with animal fat for application to the eyes in cases of extreme infection from conjunctivitis.

GUTTIFERAE

Caraipa parvielliptica Cuatrecasas in Rev. Acad. Col. Cienc. 8, No. 29 (1950) 64.

COLOMBIA: Comisaría del Vaupés, Río Kananari, Cerro Isibukuri. "Bush along rill." April 12, 1951. *R. E. Schultes et I. Cabrera 14738*. Comisaría del Amazonas, Río Apaporis, Soratama. "Height 60 feet." March 26, 1952. *R. E. Schultes et I. Cabrera 16070*. — Río Miritiparaná. "Small tree. Yukuna: see -na." May 8, 1952. *R. E. Schultes et I. Cabrera 16460*.

The Yukunas apply the sap of *Caraipa parvielliptica* to sores of the mucous membrane of the mouth. In Brazil, the sap of *C. paraensis* Huber and *C. grandifolia* Martius is similarly employed for herpes, mange and itches (Le Cointe: *A Amazonia Brasileira* 3 (1934) 424).

Several species of *Caraipa* have been reported to contain a high content of resins which are useful in treating a variety of skin

diseases. A highly toxic vermifugal constituent has been found in the seeds of *Caraipa* (Freise, F. W.: *Apoth. Zeit.* 44 (1929) 1481). Xanthones are abundant in the family (Gibbs: loc. cit. 3 (1974) 1388).

***Symphonia globulifera* Linnaeus filius, Suppl. (1781) 302.**

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Soratama. "Flowers red. Height 75 feet." December 14, 1951. R. E. Schultes et I. Cabrera 14904.

The bark of this tree, source of a very useful resinous latex, is said by the Indians of the middle Río Apaporis to be very effective, when burned to ashes and applied to recalcitrant ulcers of the abdomen and legs, in rapidly drying the infection.

***Vismia ferruginea* Humboldt, Bonpland et Kunth, Nov. Gen. et Sp. 5 (1821) 141.**

BRAZIL: Estado do Amazonas, Manáos, Flores. "Flowers greenish white. Common bush in scrub growth." July 5–August 12, 1967. R. E. Schultes 24594 (Alpha-Helix Amazon Expedition 1967).

The resinous exudate of this bush is commonly applied in the region of Manáos to sores of the skin.

An unidentified alkaloid has been reported from *Vismia robusta* (Willaman, J. J. and B. G. Schubert: *Alkaloid-bearing Plants and their Contained Alkaloids*, Techn. Bull. U.S.D.A. No. 1234 (1961) 91). Nothing else is known of the chemistry of *Vismia* which might explain the folk use in treating skin sores.

FLACOURTIACEAE

***Banara guianensis* Aublet, Hist. Pl. Guian. Franç., 2 (1775) 548.**

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Bushy tree, common on river bank. Flowers green-yellow." September 27–October 20, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24176.

A spot test with Dragendorff reagent gave a doubtful positive result for alkaloids.

Sundry species of *Ryania* are recognized in South America as poisonous. The toxicity is due presumably to a glycoside (Merz, K. W.: *Arch. Pharm.* 268 (1930) 592; Nakarai, S. et T. Sano: *Arch. Pharm.* 272 (1934) 1).

Mayna longifolia Poeppig et Endlicher Nov. Gen. et Sp. 3 (1845)
64.

COLOMBIA: Comisaría del Amazonas, Río Miritiparaná, Caño Guacayá. "Fruit cauline, greenish white." April 24, 1952. R. E. Schultes et I. Cabrera 16285.

The seeds of this shrub are crushed and boiled in water to make a tea to provoke vomiting in cases of serious food poisoning, especially from tainted fish. The tea must, however, be used with caution, since it is reputedly toxic, causing extreme dizziness, profuse sweating and uncontrollable trembling.

The plant is well known by all Indians of the area. The Makuna call it *oo-too-mee* '-ko; the Miraña, *do* '-ro-he; *ya-poo* '-moo-ho; the Yukuna, *ka-sa* '-ra ("beetle tree").

Mayna longifolia Poeppig et Endlicher var. **phasmatoarpa** R. E. Schultes in Bot. Mus. Leaf., Harvard Univ. 12 (1946) 125.

COLOMBIA: Comisaría del Vaupés, Río Vaupés near confluence of Ríos Unilla and Itilla. January 13, 1944. R. E. Schultes 5728.

This treelet is known in Spanish as *cacaoito* and *cacao blanco*; in Karijona, *ha-pe* '-ta-ke.

The orange-red aril of the seeds is applied to the gums to staunch bleeding.

Mayna toxica R. E. Schultes in Rhodora 65 (1963) 16, t. 10.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, La Pedrera and vicinity, Quebrada Tonina. On high land. "Small tree, 20 feet tall. Flowers white." October 5, 1952. R. E. Schultes et I. Cabrera 17731.

The Miraña Indians of the La Pedrera region assert that formerly the bark or seeds of this tree were given to dogs as a poison. The same uses have hitherto been reported (Schultes: *Rhodora* 65 (1963) 16) from the Vaupés and for other Indian tribes. It was then indicated that: "The fact that at least two species—*Mayna muricida* and *M. toxica*—are similarly employed for their toxic properteries by Indians in far-separated parts of the Colombian Amazon suggests that an investigation into the chemical constituents of this genus might be of interest."

Mayna sp.

The Kofáns of Ecuador treat toothache by rinsing the mouth with an infusion made by boiling the bark of this small tree in water. The plant is called *tsahave-kwa-sehe* '-pa by these Indians (H. V. Pinkley 567, cited in Pinkley: loc. cit.).

Ryania angustifolia (Turcz.) Monachino in *Lloydia* 12 (1949) 21.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Small tree in secondary growth. Flowers white. Leaves and twigs: alkaloid doubtful. Bark: alkaloid negative." September 27-October 20, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24175.

The root is considered to be poisonous by the Kubeo Indians. It is dried, powdered and used to rid clothing and hammocks of lice.

One species, *Ryania dentata*, has been reported as an ingredient of an arrow poison in Colombia (Mezey, K.: *Rev. Acad. Col. Cienc. Exact. Fís. Nat.* 7 (1947) 319). Several species of *Ryania* have been reported to have insecticidal principles (Hegnauer: loc. cit. 4 (1966) 166).

BEGONIACEAE

Begonia sp.

An infusion of the crushed leaves is employed amongst the Kofán Indians of Ecuador as a wash for "sore eyes." In the Kofán language, the plant is called *avina-chu-sehe* '-pa (H. V. Pinkley 17, 214 and 441, cited in Pinkley: loc. cit.).

THYMELIACEAE

Schoenobiblus peruvianus Standley in *Field Mus. Publ. Bot.* 6 (1936) 169.

COLOMBIA: Comisaría del Putumayo, Río Guamués, Santa Rosa. September 6, 1966. H. V. Pinkley 436. Comisaría del Putumayo, Río San Miguel, Santa Rosa. November 30, 1966. Pinkley 565.

The names of this shrub amongst the Kofáns are *andeki* and *shi-ra-chu-se-he* '-pa; in Spanish, it is known as *kegar*.

The Kofáns employ the bark of the root and the fruit in making curare. The plant is likewise used as a fish poison.

Nothing is known of the chemistry of *Schoenobiblus*.

LYTHRACEAE

Cuphea sp.

Known in Kofán as *sivi*, this small plant is burned, and the ashes are applied to treat sores of the mouth (*H. V. Pinkley 37*, cited in Pinkley: loc. cit.)

LECYTHIDACEAE

Chytroma validæ Miers in Trans. Linn. Soc. 30 (1874) 241.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro Mitú. "Flowers yellow-cream, fragrant." September 27–October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24250*.

All parts of this plant are alkaloid-negative with Dragendorff reagent.

COMBRETACEAE

Combretum Cacoucia Exell in Kew Bull. 1931 (1931) 469.

BRAZIL: Estado do Pará, Utinga, Belém. "*Rabo de arara*. Extensive liana. Acid water in stem. Flowers red, said to be poisonous." September 1947. *R. E. Schultes 8668*.

Numerous reports, similar to the folk report from Belém do Pará connected with this collection, state that the flowers of *Combretum Cacoucia* are toxic. There is apparently no chemical evidence to sustain this assertion, yet the number of reports is such that the problem bears serious study.

Caffeine and tannins have been reported from the genus *Combretum* (Gibbs: loc. cit. 3 (1974) 1478).

MELASTOMACEAE

Graffenrieda rupestris Ducke in Arch. Inst. Bio. Veg. Rio Janeiro 2 (1935) 66.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity, Cachivero de Tatú. "Tree 40 feet. Flowers white, fragrant." September 27–October 3, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24381.

The natives rub the leaves of this tree on hands that have been blistered from excessive paddling. They are alkaloid-negative with a Dragendorff spot test.

This is the first reference to *Graffenrieda rupestris* in Colombian territory.

ERICACEAE

Gaultheria anastomosana Humboldt, Bonpland et Kunth, Nov. Gen. et Sp. 3 (1819) 285.

COLOMBIA: Departamento de Cundinamarca. Pantano Redondo, Zipaquirá 3200–3250 m. July 13, 1960. R. E. Schultes 22467.

Farmers near Zipaquirá assert that this low shrub poisons cattle and sheep.

Glycosides are known from several species of *Gaultheria*. (Hegnauer: loc. cit. 4 (1966) 75).

MYRSINACEAE

Conomorpha obovata Mez in Bull. Herb. Boiss. ser. 2, 5 (1903) 535.

COLOMBIA: Comisaría del Vaupés, right tributary of Río Macu-paraná. Lowland forest. June 1–8, 1970. P. Silverwood-Cope 3.

The meaning of the name of this plant amongst the Bara-Makú of the Río Piraparaná of Colombia—*maw-ye -at-puh* "too bewitched root"—is probably indicative of the use of the root to allay toothache. Scrapings of the root are placed on the tooth.

Stylogyne amplifolia Macbride in Field Mus. Publ. Bot. 10 (1931) 33.

COLOMBIA: Comisaría del Amazonas, Río Putumayo, near mouth of Río Igaraparaná. June 1942. R. E. Schultes 3989.

The Witotos of the region of the Río Putumayo on the Colombian-Peruvian boundary refer to *Stylogyne amplifolia* as *jipina coca*, *coca silvestre*, *taife jipina*, *taife diablo* and *tay*.

heepeena. These names all suggest that the plant may serve as a substitute for *Erythroxylon Coca* var. *Ipadu* or that it may be one of the additives used with coca leaves in the region.

LOGANIACEAE

Strychnos Erichsonii R. Schomburgk Fauna Fl. Brit. Guian. (1848) 1082; in Martius, Fl. Bras. 6, pt. 1 (1868) 274, t. 82, fig. 2.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, at mouth of Río Kubiyú. "Flowers white, fragrant. Fruit orange. Extensive vine." September 27–October 30, 1966. R. E. Schultes, R. F. Raffauf et D. Soejarto 24248.

The Indians of the lower Río Vaupés formerly employed this species in preparing an arrow poison. With a Dragendorff test, the leaves were strongly positive, the bark doubtfully so.

POTALIACEAE

Potalia Amara Aublet, Hist. Pl. Guian. Franç. 1 (1775) 394, t. 151.

BRAZIL: Estado do Amazonas, Rio Negro basin. Rio Unciuxi. Makú Indian village 300 km above mouth. "Treelet, 3 m tall. Root bark scraped, mixed with Menispermaceae 15560 as ingredient for Makú snake-bite cure. *Awuibiden* (awa = "snake")." October 23, 1971. G. T. Prance et al. 15559.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro Mitú. "Flowers yellow. Used against snake bite. Five feet tall. *Martiguaje*." August 20, 1960. R. E. Schultes 23708.

PERU: Departamento Loreto, Provincia Mayna. Río Yaguasyacu, Brillo Nuevo. "Shrub 2 m in front; fresh leaves chopped with water taken internally for snake bite or against any poisonous animal (vaya, insulo). Calms the body and eliminates pain." April 12, 1977. T. Plowman, R. E. Schultes et O. Tovar 6803 (Alpha Helix Amazon Expedition 1976–1977; Phase VII).

Potalia Amara, perhaps because of a "Doctrine of Signature" effect, is widely valued as a snake bite remedy in South America. The extent of this esteem is indicated by the reports connected with the material cited above—reports on four herbarium specimens from four different Amazonian countries. The use of this plant to combat snake bite could easily be greatly expanded by citing scores of reports in the literature.

Notwithstanding the important place held in folk medicine of tropical America by *Potalia Amara*, little is known of the active constituents of the plant.

GENTIANACEAE

Chelonanthus alatus (*Willd. ex Griseb.*) *Pulle*, Enum. Pl. Surinam. (1906) 376.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro de Mitú. "Height 5 feet. Flowers yellow-green." September 27–October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24346.

This species is alkaloid-negative with Dragendorff reagent.

The Kubeo Indians take a tea of the roots and leaves to relieve a stomach condition caused apparently by eating tainted meat or fish.

APOCYNACEAE

Aspidosperma Schultesii *Woodson* in Ann. Mo. Bot. Gard. 38 (1951) 168.

COLOMBIA: Comisaría del Vaupés, Río Apaporis, Jinogojé (at mouth of Río Piraparaná) and vicinity. "Large tree." July 1952. *R. E. Schultes et I. Cabrera* 19786.

The latex of *Aspidosperma Schultesii* is valued amongst the Makuna and other Indians of the middle course of the Río Apaporis and the Río Piraparaná in the treatment of infected sores (possibly of fungal origin) between the toes. It is spread over the raw flesh and dried, acting as a protection to the wound.

A summary of the known chemical constitution of the genus *Aspidosperma* may be found in Schultes: *Journ. Ethnopharm.* 1 (1979) 167.

Tabernaemontana stenoloba *Mueller-Argoviensis* in *Linnaea* 30 (1859–60) 407.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, La Pedrera. October 3, 1952. *R. E. Schultes et I. Cabrera* 17690.

Natives in the region of La Pedrera maintain that latex in the leaves of this plant is toxic to the skin.

For a brief summary of the organic constituents in *Tabernaemontana*, see Schultes: loc. cit. 1 (1979) 184.

BORAGINACEAE

Cordia sp.

Amongst the Ecuadorian Kofáns, who call the plant *kai-ya-hi-cho-sehe* '-pa, a cold-water infusion of the bark is valued as a cough medicine (*H. V. Pinkley* 39, cited in Pinkley: loc. cit.).

Saponines, tannins, alkaloids and cyanogenesis have been reported from several species of *Cordia* (Gibbs: loc. cit. 3 (1974) 1749-1751).

VERBENACEAE

Lantana sp.

A decoction, made by boiling the leaves in water, is valued by the Kofáns of Ecuador as a febrifuge; it is also taken as an emetic. The native name of the plant is *anono-sehe* '-pa (*H. V. Pinkley* 167, cited in Pinkley: loc. cit.).

An alkaloid has been reported from *Lantana* (Raffauf: loc. cit. (1970)). Saponines, tannins and cyanogenesis have likewise been indicated for the genus (Gibbs: loc. cit. 3 (1974) 1752).

Stachytarpheta sp.

Undoubtedly a recent introduction to the Kofán region, this *Stachytarpheta*, known only by its Spanish name *verbena*, is prepared in decoction and is drunk to relieve stomach pains (*H. V. Pinkley* 292, cited in Pinkley: loc. cit.).

Saponines and cyanogenesis are reported for *Stachytarpheta* (Gibbs: loc. cit. 3 (1974) 1752).

SOLANACEAE

Acnistus arborescens (L.) Schlechtendal in *Linnaea* 7 (1832) 67.
COLOMBIA: Departamento del Huila, Pitalito, Quinche. 1300 m alt. December 30, 1942. *R. E. Schultes et M. Villarreal* 5102.

The berries of *Acnistus arborescens* are considered medicinal for treating colic by the peasants of southern Huila. They are prepared in the form of a tea.

An alkaloid—acnistine—has been reported for the genus (Raffauf: loc. cit. (1970)). *Acnistus arborescens*, the leaves of which have yielded withaferin A and withacnistin, has been used as an anti-cancer plant (Kupchan, M. *et al.*: *Journ. Am. Chem. Soc.* 87 (1965) 5805; *Journ. Org. Chem* 34 (1969) 3858). Studies have indicated that this widespread tropical American species has a number of chemical races, for other analyses of the same species have yielded other compounds (Barata, L. *et al.*: *Chem. Abstr.* 75 (1971) 115901).

***Cestrum loretense* Francey** in *Candollea* 6 (1935) 225.

COLOMBIA: Comisaría del Amazonas, Trapéicio Amazónico, Río Loretoyacu. "Bush. Flowers greenish yellow." September–November, 1944. R. E. Schultes 6018.

Amongst the Tikuna Indians, *Cestrum loretense* is reputedly toxic.

The alkaloids parquine and solasodine are reported from this genus (Raffauf: loc. cit. (1970)). Saponines and tannins have been reported from *Cestrum* (Gibbs: loc. cit. 3 (1974) 1764).

***Cestrum ochraceum* Francey** in *Candollea* 6 (1935) 343.

COLOMBIA: Comisaría del Putumayo, Valley of Sibundoy. "Flowers blue-black." May 29, 1946. R. E. Schultes *et* M. Villarreal 7658. Same locality. "Tree 5 m tall. Strong narcotic odor. Corolla cream to purplish brown. Fruit bluish." November 11, 1968. T. Plowman 2006.

The Indian medicine men of Sibundoy value the bluish or purplish fruits of *Cestrum ochraceum* in the form of a tea to provoke intensive sweating in the treatment of rheumatic pains. The patient is said to suffer a slight delirium if too much of the preparation be taken.

***Cestrum reflexum* Sendtner ex Martius var. *densiflorum* Francey** in *Candollea* 6 (1935) 267.

COLOMBIA: Comisaría del Amazonas, Río Putumayo, near mouth of Río Igaraparaná. June 18, 1942. R. E. Schultes 3994.

The Witoto Indians of the Río Igaraparaná consider the leaves and roots of this plant to be virulently toxic.

Cyphomandra endopogon Bitter in Engler, Bot. Jahrb. 54, Beibl. 119 (1916) 16.

COLOMBIA: Comisaría del Putumayo, Río Sucumbios, Quebrada Conejo. "Bush. Flowers green, anthers white. Fruits round, green, hard." April 2-5, 1942. R. E. Schultes 3652.

The leaves of *Cyphomandra endopogon* are used by the Kofán Indians to dye clay pots black.

Alkaloids have been reported from *Cyphomandra* (Raffauf: loc. cit. (1970)). Several carotinoids occur in the genus (Gibbs: loc. cit. 3 (1974) 1765.).

Datura suaveolens Humboldt et Bonpland ex Willdenow, Enum. Hort. Berol. (1809) 227.

According to Pinkley, the Kofáns give this plant to dogs for an unspecified reason. It is possible that they believe that this treatment may enhance the animal's prowess in the hunt. The Kofáns refer to the plant as *ain-vai* (H. V. Pinkley 76, 506, cited in Pinkley: loc. cit.).

This use may be related to the mydriatic properties of atropine.

Jaltomata procumbens (Cav.) J. L. Gentry in Phytolog. 27 (1973) 287.

COLOMBIA: Comisaría del Putumayo, Sibundoy. Alt. 2225-2300 m. May 29, 1946. R. E. Schultes et M. Villarreal 7615.

A tea of this plant is used in Sibundoy as a diuretic and febrifuge.

Nothing is known of the chemistry of this rare solanaceous species.

Juanulloa ochracea Cuatrecasas in Brittonia 10 (1958) 148.

COLOMBIA: Comisaría del Caquetá, Río Caquetá. Secondary forest near Floresta, c. 16 km downriver from Puerto Limón. "Climbing epiphytic shrub on fallen tree, 3 m tall. Calyx red, corolla yellow; leaves coriaceous. Trunk and leaves used for wounds. V. n. 'ayahuasca' (Inga)." December 20, 1968. T. Plowman 2176. Comisaría del Putumayo, Buena Vista. "Plant used to cure 'depo-wara'—when the heart palpitates. Stem grated and gratings mixed with water. *Siona-bi-tika-uko*. October 29, 1972. L. Piagueje s. n. (for J. Langdon).

The application to *Juanulloa ochracea* of the name *ayahuasca* may indicate that it represents either a species employed directly as the source of a narcotic or one of the numerous plant additives to the hallucinogenic drink made basically from the bark of *Banisteriopsis Caapi* or *B. inebrians* (Schultes: *Bot. Mus. Leafl., Harvard Univ.* 23 (1972) 140). There is chemical support for this belief. The alkaloid parquine has been reported from a species of *Juanulloa* (Raffauf: loc. cit. (1970)).

Markea coccinea L. C. Richard in *Acta Soc. Hist. Nat. Paris* 1 (1792) 107.

COLOMBIA: Comisaría del Vaupés, upper Río Vaupés, January 1944. G. Gutiérrez et R. E. Schultes 575. — Lago de Pasos, upper Río Vaupés. February 19, 1944. Gutiérrez et Schultes 859.

A medicine man of the nearly extinct Karijona tribe indicated that the leaves of this plant were frequently dried, powdered and eaten with *fariña*, the flour of *Manihot esculenta*, to expel intestinal parasites. The Karijona name of *Markea coccinea* is *e-ree'-ko-pa*.

The use of a decoction of the leaves of this species has been reported in the treatment of conjunctivitis and other eye diseases by the Desano Indians (Schultes: *Bot. Mus. Leafl., Harvard Univ.* 26 (1978) 192).

Nothing is known of the chemical constituents of *Markea*.

Saracha procumbens (Cav.) Ruiz et Pavón, *Fl. Peruv.* 2 (1799) 43.

COLOMBIA: Comisaría del Putumayo, Valle de Sibundoy, Sibundoy and vicinity. Alt. 2225-2300 m. May 29, 1946. R. E. Schultes et M. Villarreal 7615. — Same locality. August 22, 1963. M. L. Bristol 1328.

According to Bristol, the Kamsá Indian name of this garden plant, the fruit of which is edible, is *chuftanguemesha*. A tea of the whole plant is drunk as a diuretic and febrifuge (Schultes et Villarreal 7615).

Apparently no chemical studies on *Saracha* have been published.

Solanum apaporanum *R. E. Schultes* in Bot. Mus. Leafl., Harvard Univ. 13 (1949) 292.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú and vicinity. "Vine. Flower white. Fruit orange." September 27–October 20, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24300.

This vine is alkaloid-positive with Dragendorff reagent.

Solanum crinitipes *Dunal* in De Candolle, Prodr. 13, pt. 1 (1852) 317.

COLOMBIA: Departamento de Cundinamarca, between Agua Bonita and Aguadita. Alt. 2300 m. *H. García-Barriga et G. Stout* 18886.

The fruits of this species are reported to be toxic.

Solanum jamaicense *Miller*, Gard. Dict., Ed. 8 (1768) no. 17.

COLOMBIA: Comisaría del Amazonas, Trapéicio Amazónico, Leticia. September, 1946. *R. E. Schultes* 8207. — Leticia and vicinity. August–September 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto* 24098.

A Dragendorff test of *Solanum jamaicense* is doubtfully alkaloidal. The Tikuna Indians of the region of Leticia employ a warm decoction of the leaves as a wash for the elimination of body parasites.

Solanum lepidotum *Humboldt et Kunth ex Dunal*, Solan. Syn. (1816) 17.

COLOMBIA: Comisaría del Putumayo, Valley of Sibundoy. May 29, 1946. *R. E. Schultes et M. Villarreal* 7674.

Solanum lepidotum serves the Indians of Sibundoy as an anti-rheumatic. Crushed leaves are vigorously rubbed on aching joints to provide temporary relief.

Solanum liximitante *R. E. Schultes* in Bot. Mus. Leafl., Harvard Univ. 19 (1962) 248.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, Puerto Nariño. "Mature fruit eaten fresh; juice used to make refrescos." October 5, 1972. *L. L. Glenboski* C-84.

According to the collector, this shrubby species with edible fruits is called *coconilla* in the Trapéicio Amazónico. This widely

cultivated plant is known by a number of indigenous names in the northwest Amazon (Schultes et Romero-Castañeda: *Bot. Mus. Leaflet*, *Harvard Univ.* 19 (1962) 249-250).

***Solanum mammosum* Linnaeus, Sp. Pl. (1753) 187.**

COLOMBIA: Comisaría del Putumayo, Río Putumayo, Puerto Ospina. "*Kuku-na; tetilla*. March 23-25, 1942. *R. E. Schultes* 3450. Comisaría del Amazonas, Río Karaparaná, between El Encanto and the mouth. May 22-28, 1942. *Schultes* 3808.

ECUADOR: Napo, Dureno, Río Aguarico. February 28, 1966. "Kofán = ko-ko-no-cho." *H. V. Pinkley* 172.

The pulp and seeds of *Solanum mammosum* are employed by the Kofán Indians to alienate cockroaches which often constitute a plague in their houses. This use is widely known, and the fact that the two names of the plant amongst the Kofáns are obviously borrowed from Spanish indicates that the plant has been a rather recent importation from elsewhere.

The Kofáns report the use of this plant as a "pacifier for small children" (*Pinkley* 172).

***Solanum ovalifolium* Humboldt et Kunth ex Dunal, Solan. Syn. (1816) 37.**

COLOMBIA: Comisaría del Putumayo, Valley of Sibundoy, "Medicinal. Used for soap. *Gujaco; ujaco*." October 30, 1962. *M. L. Bristol* 321.

Bristol indicates that this plant is employed as a medicine in Sibundoy, but no specific illness has been cited.

***Solanum platyphyllum* Humboldt et Bonpland ex Dunal, Solan. Syn. (1816) 38.**

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Miraflores. January 29, 1944. *G. Gutiérrez et R. E. Schultes* 706. Comisaría del Putumayo, Río Sucumbios, Quebrada Conejo. "Fruit edible." April 2-5, 1942. *Schultes* 2494. Comisaría del Putumayo, road between Pepino and Mocoa, 700 m alt. July 28, 1960. *Schultes* 22556.

The fruit of this widespread species is edible. The plant is found semi-cultivated in all parts of the northwest Amazon.

***Solanum scabridum* Dunal in De Candolle, Prodr. 13, No. 1 (1852) 360.**

COLOMBIA: Comisaría del Amazonas, Río Amazonas, Puerto Nariño. "Espina." October 14, 1972. *L. L. Glenboski C-91*.

According to Glenboski, the inhabitants of the Río Loretoyacu area of the Trapécio Amazónico make a decoction of the pith of the stem to treat earaches.

***Solanum straminifolium* Jacquin, Misc. 2 (1781) 298.**

COLOMBIA: Comisaría del Amazonas, Río Caquetá, La Pedrera. April 1944. *R. E. Schultes 5883*. Comisaría del Vaupés, Río Apaporis, mouth of Río Pacoa. June 17, 1951. *R. E. Schultes et I. Cabrera 12586*. — Río Vaupés, Paracuara. November 27, 1952. *R. Romero-Castañeda 3777*.

The Kuripako name of this edible-fruited shrub is *mai-ya'-vee*. The Tukanos of the Río Vaupés know it as *eto-paa*.

The Miraña Indians who live near La Pedrera crush the leaves of *Solanum straminifolium* and apply them as a poultice to severe burns.

***Solanum subinerme* Jacquin, Enum. Pl. Carib. (1760) 15.**

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Mitú. "Height 4-5 feet. Flowers blue-purple. Weedy." September 27-October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24244*.

Dragendorff test of the leaves of *Solanum subinerme* was positive for alkaloids.

***Solanum Topiro* Humboldt et Bonpland ex Dunal, Solan. Syn (1816) 10.**

COLOMBIA: Comisaría del Vaupés, Río Apaporis, mouth of Río Pacoa. June 17, 1951. *R. E. Schultes et I. Cabrera 12602*.

The Kuripako Indian name of this widely cultivated edible-fruited species of *Solanum* is *ma-re'-da*.

***Solanum verbascifolium* Linnaeus, Sp. Pl. (1753) 184.**

COLOMBIA: Comisaría del Putumayo, Mocoa. December 3-7, 1942. *R. E. Schultes et C. E. Smith 2035*. — Comisaría del Amazonas, Río Caquetá, La Pedrera. April 1944. *R. E. Schultes 5878*. — Comisaría del Vaupés, Río Vaupés, Cerro Mitú. "Herb up to 3 feet. Flowers white. Leaves used for washing; asperous." September 27-October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24228*.

The leaves of this plant are asperous and cause an irritating skin rash and itching. They are strongly alkaloid-positive with a Dragendorff spot test.

Solanum sp.

The Kofáns, who know this *Solanum* as *toto-paje*, employ a decoction of the bark as an emetic (*H. V. Pinkley 480*, cited in Pinkley: loc. cit.).

BIGNONIACEAE

Pseudocalymma alliaceum (Lam.) Sandwith in Rec. Trav. Bot. Néerl. 34 (1937) 210.

COLOMBIA: Comisaría del Amazonas, Río Amazonas, Leticia. Alt. 100 m. "Arbusto de 1.5 m, esteril. Olor fuerte aliaceo. Alcaloides: positivo. Nombre vulgar: *sacha-ajo*." October 8, 1961. *J. M. Idrobo 4687*.

Although this plant is alkaloid-positive with a Dragendorff test, the whole plant crushed and made into a tea is taken frequently to relieve pulmonary ailments by the people of the Leticia area.

No chemical studies of *Pseudocalymma* appear to have been published.

ACANTHACEAE

Fittonia argyroneura E. Coemans Fl. des Serres 16 (1865-1867) 103.

ECUADOR: Napo, Río Aguarico, Dureno. December 21, 1965. *H. V. Pinkley 15*.

A cold-water infusion of a decoction of the whole plant steeped in water is used by the Kofáns as a rinse of the mouth and for toothache. The Kofán name of the plant is *minakoro-se-he'-pa*.

RUBIACEAE

Arcytophyllum nitidum (HBK.) Schlechtendal in Linnaea 28 (1856) 492.

COLOMBIA: Departamento de Cundinamarca. Macizo de Bogotá, Quebrada Chicó, near Bogotá, 2700-2750 m. May 3, 1946. *R. E. Schultes et M. Villarreal 7096*.—Siberia. Páramo de Palácios, 9,000-10,000 feet. July 13, 1960. *R. E. Schultes 22477*.

The burning wood of this low shrub is said to give off a smoke that is extremely irritating to the membranes, causing painful swelling of the nasal passages.

***Cephaelis barcellana* (Muell.-Arg.) Standley** in Publ. Field Mus. Nat. Hist. Bot. 8 (1930) 184.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro Mitú. "Bracts red. Flowers yellow. Height 8 feet. In white sand." September 27-October 30, 1966. *R. E. Schultes, R. F. Raffauf et D. Soejarto 24222*.

All parts of this plant are alkaloid-positive with a Dragendorff spot test.

***Duroia* sp.**

Amongst the Kofáns, who refer to the plant as *kayhi-chu-sehe* '-pa, a cold-water infusion of the stems is drunk as a cough remedy (*H. V. Pinkley 249, cited in Pinkley: loc. cit.*).

***Pentagonia* sp.**

The Kofáns are accustomed to place the pulp around the seeds into fresh cuts to keep the flesh from becoming infected. The Kofán name is *mankuyahet-chu-sehe* '-pa (*H. V. Pinkley 248, cited in Pinkley: loc. cit.*).

SAMBUCACEAE

***Sambucus* sp.**

The Kofáns boil the young leaves and inflorescences to prepare a drink which is taken while hot for pains in the sides from coughing (*H. V. Pinkley 401, cited in Pinkley: loc. cit.*). The Kofán name is *sa-oco-sehe* '-pa.

Leucoanthocyanins (Gibbs: loc. cit. 2 (1974) 1266) and an alkaloid (Raffauf: loc. cit. (1970)) have been reported from the genus.

VALERIANACEAE

Valeriana longifolia *Humboldt, Bonpland et Kunth, Nov. Gen. et Sp. 3 (1819) 330.*

COLOMBIA: Departamento de Cundinamarca. Pantano Redondo, Zipaquirá, 3200-3250 m. July 13, 1960. *R. E. Schultes 22468.*

A tea prepared from the leaves of *Valeriana longifolia* is commonly used in the region of Zipaquirá as a kind of a panacea in folk medicine. It is especially valued as a stimulant for aged people.

An alkaloid—a derivative of actinidine—is reported from a species of *Valeriana*; tannins have also been indicated (Gibbs: loc. cit. 2 (1974) 1268; Raffauf: loc. cit. (1970)).

CUCURBITACEAE

Cayaponia glandulosa (*Poepp. et Endl.*) *Cogniaux in De Candolle, Monogr. Phan. 3 (1881) 755.*

COLOMBIA: Comisaría del Amazonas, Río Amazonas, Trapéicio Amazónico. January 28–February 7, 1969. *T. Plowman, T. Lockwood, H. Kennedy et R. E. Schultes 2369.*

The leaves and young stems of this vine are dried and pulverized and employed in hammocks and cloths as an insect repellent. The fruit is chopped up, boiled in water and the resulting infusion is taken in the Leticia area for "liver complaints."

The vine is very abundant, forming great tangles on the riverside vegetation.

No active organic principle is known from this genus.

Cayaponia sp.

Stems of this species of *Cayaponia* are reportedly burned, and amongst the Kofán Indians the ashes are applied to external sores. The Kofán name of this vine is *chorok-o-pi-sehe '-pa* (*H. V. Pinkley 222, cited in Pinkley: loc. cit.*).

CAMPANULACEAE

Centropogon solanifolius *Bentham*, Pl. Hartw. (1846) 139.

Among the Kofáns, this plant is "given to dogs" for an unspecified reason but possibly in the belief that their hunting prowess may thus be enhanced (*H. V. Pinkley* 6, cited in Pinkley: loc. cit.). The Kofán name is *ain-di-shi-sehe* '-pa.

The chemistry of *Centropogon* is unknown.

COMPOSITAE

Senecio abietinus *Willdenow ex Weddell*, Chlor. And. 1 (1855) 100, 101.

COLOMBIA: Departamento de Cundinamarca. Pantano Redondo, Zipaquirá, 3200-3250 m. July 13, 1960. *R. E. Schultes* 22471.

The resinous smoke from wood of this shrub causes a long-lasting burning sensation of the nose and mouth.

Many species of *Senecio* are alkaloidal (*Wellman and Schubert*: loc. cit. (1961) 71-75; *Raffauf*: loc. cit. (1970)). Cyanogenic glycosides are frequent in the genus (*Gibbs*: loc. cit. 2 (1974) 1195).

PLATE 1

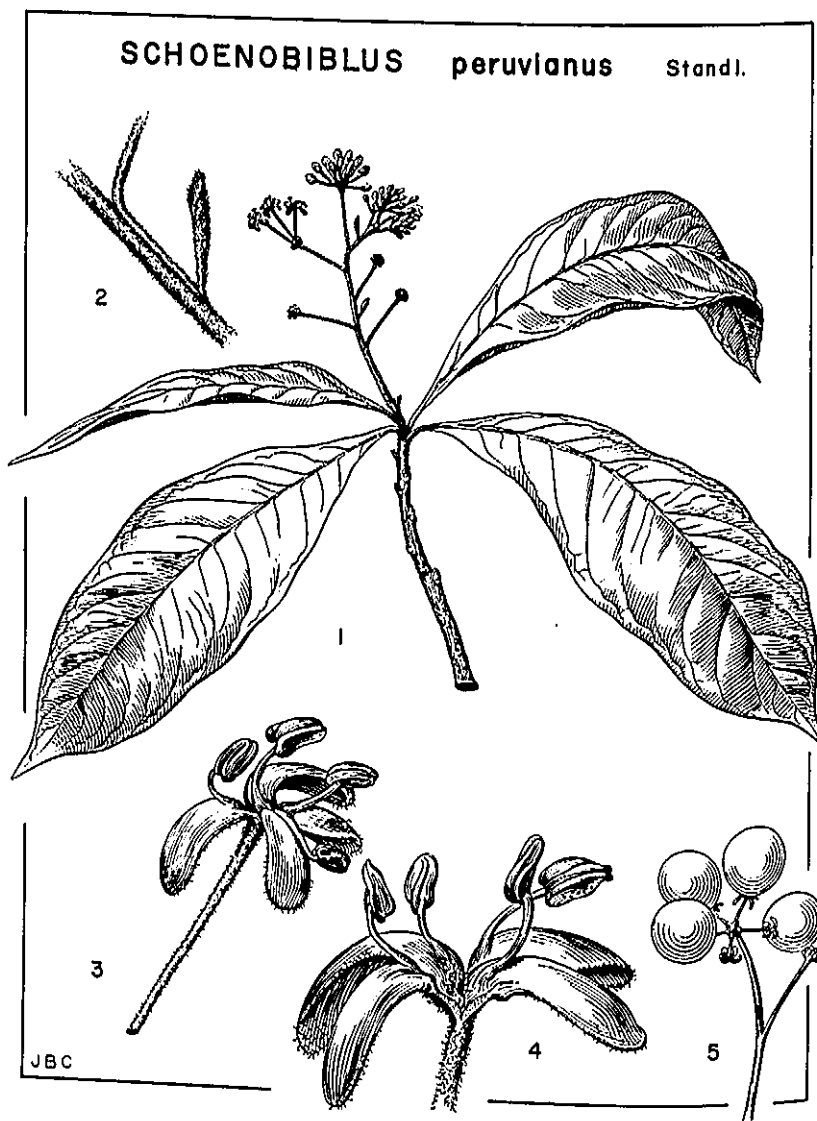


PLATE 2

UNONOPSIS venificlorum (Mart.) R.E.Fr.

