



DE PLANTIS TOXICARIIS E MUNDO NOVO TROPICALE COMMENTATIONES XXVI:
ETHNOPHARMACOLOGICAL NOTES ON THE FLORA OF NORTHWESTERN SOUTH AMERICA

Author(s): Richard Evans Schultes

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**ETHNOPHARMACOLOGICAL NOTES ON THE
FLORA OF NORTHWESTERN SOUTH AMERICA**

RICHARD EVANS SCHULTES

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 indigenous materia medica of the northwestern Amazon represents an untapped assemblage of plants, many of which might be of interest to pharmacological and phytochemical scientists. The flora of the Amazon Valley—undoubtedly surpassing 73,000 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 acculturation or extinction of the aboriginal populations, an extensive ethnobotanical survey of lore and practice extending at least over 5000 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 the 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 (1979) 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 Gray Herbarium, both 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. Soejarto 24038.

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, Trapécio 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 Igarapará. June 18, 1942. *R. E. Schultes* 3994.

The Witoto Indians of the Río Igarapará 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 Unive.* 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 *chuftanguemsha*. 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.

T. Mione identifies both of these specimens as *Jaltomata procumbens* (Cav.) J.L. Gentry

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