SUPPLEMENTARY NOTES ON THE AMERICAN SPECIES OF STRYCHNOS. XIV.

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Contents

Introduction

At the time when I was working on the first Monograph of Strychnos in 1941, I never thought that the genus in the Americas would grow so much. I proved wrong when I suggested that only a few novelties were to be expected. Adolpho Ducke took me to task for this statement in several of his papers.

The first monograph dealt with 46 species and one variety. Two of these species, namely, S. smithiana and S. longisepala, have since been reduced to synonymy. In the second revision, published in September 1972, I recognized 70 species and two varieties, all of which are valid. Presently, the genus in the Americas contains 74 species and two varieties.

Since the last of this series of papers was submitted for publication in 1973, 179 new collections have been examined. The newly examined collections added to our knowledge of many species; extensions of ranges are noted for 38, and one new species, Strychnos croatii Krukoff & Barneby, is described. The most important additions concern Strychnos xinguensis (we have been waiting for the second collection in flower and the first collection in fruit since 1942) and S. fendleri collected by Dr. J. Murça Pires in a most unexpected place - Roraima. S. fendleri was previously known only from the

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drier tropics in Venezuela. New collections of S. chlorantha, S. colombiensis, S. araguaensis, and S. brachiata are also most interesting. Fruits of S. asperula and S. alvimiana are described for the first time.

With exploration in Brazilian and Peruvian Amazonia being accelerated, it is to be hoped that before long we will get many other interesting collections and novelties. We badly need new fertile collections of S. krukoffiana, S. lobelioides, S. goiasensis, S. cayennensis, S. duckei, S. progeliana, S. neglecta, S. cerradoensis, and S. schunkei, all known from a single collection (or from two collections from a single plant), also of S. solimoesana, S. pachycarpa and S. malacosperma. New collections from the Pacific coast of Colombia (especially Chocó), Amazonian Ecuador, Bolivia, and Bahia (Brazil) would be welcome. Novelties are most likely to be found in these regions.

The chemical work on Strychnos of Professor Marini-Bettolo is continuing, as can be seen from the papers cited in the bibliography.

Most timely and most interesting contributions were made by Dr. Ghillean Prance who made various trips, collected botanical specimens and samples for chemical assays, and photos of Curare preparation by four Indian tribes. It is to be noted that the ingredients of Curare as prepared by these Indians were not known and the knowledge of them would not be preserved, as Indians are quickly becoming extinct. Two of these tribes, "Paumari" and "Jamamadi," inhabit the basin of Rio Purus, and the other two, the "Mayongong" and "Sanama," are from the territory of Roraima.

Tendrils

At the time when I was working on the monograph in 1941, I was in touch with N. Y. Sandwith, Paul Standley, and others, in order to find out whether or not tendrils resembling those of Strychnos occur in any other plants. My attempts were unsuccessful. Recently, by chance, I saw the tendrils of a species of Bauhinia, and below I quote the comments of Dr. Richard Wunderlin, student of the genus Bauhinia:

> "Tendrils resembling those found in Strychnos occur in a large number of species of Bauhinia (Leguminosae) in both the Old and New World tropics. The 200 or so species of Bauhinia fall into two general groups of nearly equal size: one consisting of trees and shrubs,

these sometimes with axillary spines, and the other of lianas or scrambling shrubs, nearly all of which possess simple, woody, circinate, compressed tendrils. Of the tendriled species, about 20 are found in the New World and 60-80 in the Old World. The tendrils found on Bauhinia are solitary at the nodes, although frequently appear to be paired. However, the latter situation is believed to be due to the failure of the internode to elongate and the paired condition actually is due to two nodes in proximity. The tendrils found in Bauhinia, as in Strychnos, tightly coil around objects with which they come into contact and provide support for the plant. It is of interest to note that the tendrils are equally well developed in the scrambling shrub and the liana species of Bauhinia, posting the question as to which growth form is the derived condition."

1. Strychnos chlorantha Progel in Mart. Fl. Bras. 6(1):273. 1868.

Costa Rica: Alajuela: San Carlos, Barquero s.n. (13/11-73) (CR); Heredia: camino a Sarapiqui, L. J. Poveda s.n. (9/8-75) (CR). Panama: Panama: 5-10 km NE of Altos de Pacora, alt. ±600 m, Mori & Kallunki 3318 (MO).

The shells of the fruit of this species are very thick (±10 mm) and Adolpho Ducke told me that he observed that it takes ±two years before such thick shells of Amazonian species disintegrate and germination takes place. It would be interesting to check this experimentally.

This species is the only one known to me that forms thickets as it reproduces naturally by suckers.

These are the first records of this species from the province of Heredia in Costa Rica and from the province of Panama in Panama.

2. Strychnos ramentifera Ducke, Bull. Mus. Hist. Nat. Paris. II. 4:745. 1932.
Strychnos leenhoutii Tirel, Adansonia, ser. 2, 9, 1:121. 1969.

The author of S. leenhoutii reduced this name to synonymy in Adansonia, ser. 2, 9 (4) 1969. It has been described on the basis of a plant cultivated in Tonkin.

Brazil: Amazonas: Ceplac, km 29, Manaus - Itacoatiara road, terra firme, Prance et al. 22730.

3. Strychnos colombiensis Krukoff & Barneby, Mem. N. Y. Bot. Gard. 12(1):21. 1965.

Panama: Colon: 2-3 mi up the Rio Guanche, alt. +15 m, Helen Kennedy 2159a. Colombia: Choco: H. P. Fuchs et al. 22273 (COL). Peru: Loreto: Contamana, alt. +210 m, Schunke 6658 (F); Amazonas: alt. +360 m, Ernesto Ancuash 276.

These are the first records from Choco in Colombia, for departments of Loreto and Amazonas in Peru, and for Panama. This species was known previously only from Valle and Narino (Colombia) and Cuzco (Peru).

4. Strychnos asperula Sprague & Sandwith, Kew Bull. 1927:131. 1927.

Brazil: Amazonas: basin of Rio Negro, Reserva Ceplac, Manaus - Itacoatiara Road, km 29, terra firme, Q IV, Prance et al. 23153 (frts - Dec. 24, 1974).

Fruits of this species are described here for the first time: "Fruits globose, large, +5-1/2 cm in diam; pericarp very thick, +9 mm, hard, dark brown, regularly and deeply sculptured; seeds many, rotten in one fruit seen."

Only in two other species, Strychnos pachycarpa and S. chlorantha is the pericarp 9-10 mm thick. These three species are very rare. See remarks concerning germination of their seeds under S. chlorantha. It would be interesting to check whether or not S. asperula and S. pachycarpa reproduce naturally by suckers, as is the case with S. chlorantha.

This is the first record of this species from the basin of Rio Negro.

6. Strychnos rondeletioides Spruce ex Bentham, Jour. Linn. Soc. 1:104. 1856.

Brazil: Para: Rio Trombetas, Prance et al. 22506 Amazonas: Rio Taruma, near Manaus, Al. Gentry & Jose Ramos 12893, Rio Uaupes, varzea, M. F. Silva et al. 1551 (INPA), Rio Xie, N. T. Silva 3873 (IAN), basin of Rio Madeira, Froes 33638 (IAN), basin of Rio Solimoes, mun. São Paulo de Olivença, B. S. Pena 551 (IAN).

This is the first record of this species for Rio Trombetas.

8. Strychnos barnhartiana Krukoff, Brittonia 4:268. 1942.

Brazil: Amazonas: Ceplac, km 29, Manaus - Itacoatiara road, terra firme, Prance et al. 22731.

9. Strychnos araguaensis Krukoff & Barneby, Mem. N. Y. Bot. Gard. 20(1):24. 1969.

Brazil: Para: Ilha do Marajo, Bento S. Pena 246 (14/9-1971-flrs); Mato Grosso: +270 km N of Xavantina, J. A. Ratter et al. 1467 (IAN).

In the State of Para, this species was known only from the basin of Rio Araguaia.

10. Strychnos brachiata Ruiz & Pavon, Fl. Per. 2:30. 1799.

Brazil: Para: Rio Jari, varzea, N. T. Silva s.n. (28/4-1969) (IAN); Amazonas: basin of Rio Negro, Taracua, Murca Pires & N. T. Silva 7891a; boca do Acre, Prance et al. 2558 (MG); Acre: near Brasilia, N. T. Silva 3534 (IAN).

These are the first records for the basins of Rio Jari, Rio Negro, Rio Purus, and for the State of Acre.

11. Strychnos trinervis (Velloso) Martius, Syst. Mat. Med. Bras. 121. 1843.

Brazil: Sta. Catarina: coll. undesign. 97 (Nov. 1883) (Herb. Ule) (HBG) (São Francisco), coll. undesign. 1209 (Oct. 1888) (Herb. Ule) (HBG); Goias: Serra Geral do Parana, W. R. Anderson 7813.

12. Strychnos panamensis Seemann, Bot. Voy. Herald, 166. 1854.

Panama: Canal Zone: R. Foster 535 (DUKE), 1970 (DUKE), James L. Luteyn 921 (DUKE); Panama: Helen Kennedy 1223 (DUKE); Veraguas, NW of Santa Fe, Mori & Kallunki 6228 (MO). Colombia: Choco: Duke 11095 (Rio Truando), H. P. Fuchs et al. 21814 (COL).

13. Strychnos tabascana Sprague & Sandwith, Kew Bull. 1927:128. 1927.

Costa Rica: Alajuela: San Carlos, Humberto Barquero s.n. (13/11-73) (CR).

14. Strychnos divaricans Ducke, Bull. Mus. Hist. Nat. Paris II. 4:746. 1932.

Brazil: Para: basin of Rio Tocantins, Serra Buritirama, Murça Pires 12454.

This is the first record of this species from the basin of Rio Tocantins.

Froes 20192 from Bahia, deposited at F, is Strychnos divaricans, but the label does not belong with the specimen. Incidentally, this species has not yet been collected in Bahia. Froes 20192/33 (NY) and (IAN) are of Strychnos gardneri A. DC. and the label belongs here. This species is known to occur in Bahia.

16. Strychnos eugeniifolia Monachino, Phytologia 4:209. 1953.

Brazil: Amapá: Rio Araguari, Serra do Navio, Murca Pires et al. 51249 (MG).

This specimen was erroneously cited as S. guianensis (Lloydia, 35:268. 1972).

17. Strychnos krukoffiana Ducke, Trop. Woods 90:27. 1947.

This species is known only from two collections from the same plant, and although it was originally collected near Manaus, it has not been found since.

18. Strychnos medeola Sagot ex Progel in Mart. Fl. Bras. 6(1):282. 1868.

French Guiana: Saul, Piste Crique Limonade, Lescure 18 (CAY).

From the root bark (N. T. Silva 3408) 11--methoxydiaboline and from the stem bark of the same plant, normacusine B were isolated. This is the first time normacusine has been found in a species of Strychnos. It was previously known to occur in various species of the Apocynaceae (109 p.).

This is the first time S. medeola was studied chemically.

19. Strychnos toxifera Robert Schomburgk ex Bentham, Jour. Bot. Hook. 3:240. 1841.

Panama: Canal Zone: Robin Foster 1089 (DUKE), 1946 (DUKE), 2153 (DUKE), M. Nee & D. Smith 11077 (MO); Darien: headquarters of Rio Tuquesa, Croat 27113 (MO).

21. Strychnos diaboli Sandwith, Kew Bull. 1931:486. 1931.

Brazil: Territory of Roraima, vicinity of Auaris (64°25'W, 4°6'N) ±800 m, terra firme, Prance et al. 21617.

According to the collector, this is the principal ingredient in Mayongong curare.

It is called by Mayongong Indians - "Cumadua."

This is the first record of this species from Brazil.

24. Strychnos jobertiana Baillon, Adansonia. 12:367. 1879.

Brazil: Amazonas: Prance 17673, 18127 and M. F. Silva et al. 60 (INPA) (near Manaus); B. G. S. Ribeiro 250 (IAN). Peru: Amazonas: Rubio Kayap 179, 1230.

This is the first record of this species from Amazonas (Peru).

Rubio Kayap reports on the label of 1230: "root used for dart venom"; native name "Paigsi uweke."

25. Strychnos pseudo-quina A. St. Hilaire, Mem. Mus. Paris 9:340. 1822.

Brazil: Goias: W. R. Anderson 9034, 8008 (Serra dos Cristais, 12 km N of Cristalina, alt. ±1060 m, cerrado), Irwin et al. 34715 (14 km S of Niquelandia, cerrado).

26. Strychnos xinguensis Krukoff, Brittonia 4:283. 1942.

Brazil: Para: Murça Pires & R. P. Belem 12505 (cipo robusto), beira do rio. (flrs - July); 12287 (basin of Rio Tocantins, Serra Buritirama, Rio Itacaiunas); W. R. Anderson 10987 (frts - Febr.) (Alto Tapajos, Rio Cururu, varzea, alt. 130 m; B. S. Pena 461 (basin of Rio Trombetas); Ribeiro s.n. (10/3-1971) (IAN) (terra firme, Colares).

Previously, this species was known only from the type collection which is in flower. We have been waiting for the second flowering collection and the first collection with fruit since 1942.

In 1967, with some doubt, I included in this species the sterile specimen (G. A. Black & E. Cordeiro #52-14910) from Bolivia, Rio Guapore, furo São Simãozinho. It is satisfactory to report that after comparing this specimen with the recently collected material cited above, it definitely belongs here.

Mature fruits more or less globose, irregularly spheroid, small, the largest examined 2.5 cm in diam; shell thin, ±0.8 mm thick, pale, brown, shining, smooth; testa crustaceous;

seeds few, more or less discoid, about 20 mm long and 14 mm broad.

On the basis of a type collection in flower, I correctly predicted in 1969 that the fruits of this species are probably small with thin pericarp (Mem. N. Y. Bot. Gard. 20(1):18. 1969).

It has now become evident that this species is found in varzea as well as on terra firme, also that it has small fruits (up to 2.5 cm in diam) with thin pericarp (±0.8 mm thick). Its leaves are quite distinct, as they are conspicuously hirtellous-barbate in axils of the inner principal nerves. In the section Strychnos, only S. darienensis, S. gardneri and S. pubiflora have such an indumentum.

27. Strychnos amazonica Krukoff, Brittonia 4:284. 1942.

Brazil: Para: Rio Jari, N. T. Silva 3237 (IAN); Amazonas: near Manaus, Al. Gentry 13229, W. Rodrigues 9182 (INPA).

From the root bark (Prance et al. 4803) nordihydrofluorocurarine (18-desoxy Wieland-Gumlich aldehyde) and nordihydrotoxiferine were isolated. (109_0). This is the first report of the natural occurrence of the former compound.

29. Strychnos froesii Ducke, An. Acad. Bras. Ci. 23:209. 1951.

From the root bark (Ducke s.n. (5-1955) Manaus, near the Taruma Falls) nordihydrofluorocurarine, diaboline and desacetyldiaboline were isolated (109_0).

31. Strychnos peckii B. L. Robinson, Proc. Amer. Acad. 49:504. 1913.

Belize: Stann Creek District, Croat 24206. Costa Rica: Puntarenas: El General Valley, L. O. Williams et al. 28692 (EAP). Brazil: Mato Grosso: Aripuanã, Lisboa et al. 571.

32. Strychnos erichsonii Richard Schomburgk, Reisen 3:1082. 1848, nomen: ex Progel in Mart. Fl. Bras. 6(1):274. 1868.

Surinam: J. Lanjouw & J. C. Lindeman 638. French Guiana: River Grand Inini, Oldeman B.-3614. Brazil: Para: basin of Rio Tocantins, Serra Buritirama (Rio Itacaiunas), região com minerio de manganes, Murça Pires & R. P. Belem 12227, 12386, 12614; Amazonas: basin of the upper Rio Negro: M. F. Silva et al. 1249 (INPA), 1262 (INPA), 1444 (INPA); Manaus - Porto Velho highway, Prance et al. 20581; Mato Grosso: Rio Aripuana, above Andurina Falls, varzea, Prance et al. 18651.

This is the first record of this species from the basin of Rio Tocantins.

32a. Strychnos croatii Krukoff & Barneby, sp. nov.

Ad sectionem Strychnos referenda, S. erichsonii affinis sed fructu subduplo majori 8 (nec. 3.5) cm usque diam absimilis.

Macroscopic: petioles 9-12 mm long; blades more or less elliptic, 12-25 cm long, 4-12.5 broad, rounded to obtuse at base, usually short - acuminate at apex, dull to shining and usually concolorous, the old ones occasionally drying an olive-ocher yellow, coriaceous, 3 (5)-plinerved with the inner pair opposite or alternate and diverging at 5-10 mm from base, reticulation prominulous to somewhat prominent on both surfaces. Microscopic: essentially glabrous in all parts (occasionally puberulent on principal nerves near the base below).

Inflorescences (in fruit) in axillary thyrses; flowering inflorescences and flowers not seen; Helen Kennedy on label of #2159 states: "corolla tube cream, lobes cream."

Mature fruits more or less globose (irregularly spheroid), large, the largest examined 8.0 cm in diam; shell thin ±1.0 mm thick, brown, shining, smooth; testa crustaceous; seeds many, more or less discoid, about 22 mm long and 12 mm broad; fruit-pedicels about 1.2 mm in diam.

From the labels of ten collections, it is possible to conclude that this species is found in lowland rain forest at the altitude of 10-550 m. It begins to flower and bear fruit when very young and all collections are from shrubs 3-4 m high, devoid of tendrils and spines (except for Croat 22757 which is described as liana and is provided with tendrils). The flowering season is probably from September to January.

Panama: Colon: 2-3 mi up the Rio Guanche, Helen Kennedy & Robin Foster 2159 (Holotype-NY, MO) (frts - Jan. 19); San Blas: SE of Puerto Obaldia, Croat 16775 (MO); Panama: Croat 22757 (MO) (Campo Tres, 3 mi NE of Altos de Pacora), Geo. Barrett, Jr., et al. 3437 (MO) (±25 mi NE of Cerro Azul on Rio Piedras) (mature frts Nov. 20); Darien: Narciso Bristan 1264 (MO) (La Boca de Pierre) (imm. frts Oct. 13), Duke 8190 (MO), 8782 (MO) (Rio Balsa), 14576 (MO) (±1 mi SE of Rio Tuira) (fruit of this collection is not of Strychnos), Mori & Kallunki 5387 (north slopes of Cerro Pierre) (mature frts Apr. 4). Colombia: Choco: Forero, Jaramillo & McElroy 1251 (Carretera Quibdo - Guayabal, alt. 40 m), Jaramillo & McElroy 1310 (Rio Serrano, afluente del Rio Atrato), Forero et al. 1489 (COL) & 1524 (Rio Munguido).

Several collections of this species were previously placed provisionally under the related S. erichsonii. We quote Phytologia, 27:100. 1973: "Fruits of Kennedy & Foster 2159 are unusually large for the species (up to 7.5 cm in diam) and it is conceivable that it is a new species."

Two excellent new collections in mature fruit with several duplicates cited above show clearly that it is a new species.

It is distinguished by its larger fruits, up to 8 cm in diam, not up to 3.5 cm in diam as in S. erichsonii. The leaf laminas of S. erichsonii have dots, sometimes obscure, and are usually universally puberulent with very short adpressed hairs; above they are usually tuberculate to blistered, whereas in S. croatii the laminas have no dots, are essentially glabrous in all parts (occasionally puberulent on principal nerves near the base below), and are usually not tuberculate to blistered above. It is very likely that the ranges of the two species do not overlap, as S. croatii is probably confined to Panama (below the Canal Zone) and the adjacent Chocó region of Colombia.

It is named in honor of Thomas B. Croat who made two fruiting collections and who is making a determined effort to obtain flowering material.

33. Strychnos gardneri A. DeCandolle in DeCandolle, Prodr. 9:14. 1845.

Brazil: Goias: W. R. Anderson 6601.

35. Strychnos bredemeyeri (Schultes) Sprague & Sandwith, Kew Bull. 1927:128. 1927.

Venezuela: Amazonas: orillas de los Rios Manapiare y Ventuari, Getulio Agostini 1525 (VEN), 1526 (VEN).

36a. Strychnos mitscherlichii Richard Schomburgk var. mitscherlichii, Reisen 2:451. 1848.

Brazil: Para: basin of Rio Trombetas, km 72, access road from cachoeira Porteira to Perimetral do Norte, along river bank, Prance et al. 22260. Peru: Amazonas: alt. 250 m, Berlin 1716.

This is the first record of this variety from Peru.

38. Strychnos darienensis Seemann, Bot. Voy. Herald 166. 1854.

Panama: Canal Zone: Montgomery 97 (MO), Colon: 10 mi SW of Puertobelo, R. L. Liesner 1037. Peru: Loreto: Maynas, Croat 20419 (Rio Tacsha Curarey), F. Ayala 704 (MO), McDaniel & Rimachi 18403 (Iquitos, Rio Nanay), Rimachi 786 (Iquitos).

This is the first record of this species from the province of Colon.

39. Strychnos guianensis (Aublet) Martius, Syst. Mart. Med. Bras. 121. 1843.

Brazil: Para: basin of the upper Tapajos, varzea of Rio Cururu, alt. +130 m, W. R. Anderson 10805, 10879, 11038; Amazonas: Prance et al. 21832, 21937 (Rio Cuieiras), Al. Gentry 13222 (near Manaus), basin of the upper Rio Negro: M. F. Silva et al. 1368, 1442, 1673, 3869; basin of Rio Solimoes: Albuquerque et al. 517, 529, 534; Mato Grosso: W. R. Anderson 8356, 9873, Prance et al. 18402 (Rio Aripuaná); Rondonia: road Porto Velho - Humaitá, Prance et al. 19452; Roraima: Murca Pires et al. 13984 (Rio Xeriuini, catinga seca, alagavel), Prance et al. 21618 (terra firme, vicinity of Auaris), Pena 336 (IAN) (Auai), Murca Pires 13984 (IAN) (Rio Xeriuini), Ribeiro 381 (IAN) (Pista da Anana). Colombia: Chocó: Forero et al. 1489.

Prance reports on the label of 21618 that it is an ingredient of Mayongong Curare who call the plant "Quamitea." See also under Strychnos diaboli.

This is the first record of this species from Choco.

40. Strychnos glabra Sagot ex Progel, Mart. Fl. Bras. 6(1):275. 1868.

Brazil: Para: W. R. Anderson 10598 (basin of the upper Tapajos, Rio Cururú, alt. +140 m), B. G. S. Ribeiro 116 (IAN) (Colares, terra firme); Amazonas: basin of the upper Rio Negro, Cavalcante 3099 (MG).

This is the first record of this species from the basin of Rio Tapajos.

41. Strychnos subcordata Spruce ex Bentham, Jour. Linn. Soc. 1:106. 1856.

Brazil: Amazonas: near Manaus, Prance et al. 17690.

43. Strychnos panurensis Sprague & Sandwith, Kew Bull. 1927:132. 1927.

Panama: Panama: Robin Foster 1824 (DUKE) (slopes of Cerro Jefe), Mori & Kallunki 2169 (on road past Cerro Azul), 2908 and 3058 (El Llano - Carti Road, alt. 410 m). Brazil: Minas Gerais, mun. Jaboticuba, Rio do Cipo, Hatschbach 30032. Peru: Loreto: Maynas, Iquitos, Rimachi 302.

This is the first record of this species from the State of Minas Gerais.

46. Strychnos hirsuta Spruce ex Bentham, Jour. Linn. Soc. 1:106. 1856.

Brazil: Amazonas: Prance et al. 22104 (Rio Maues), 23126 (Manaus - Itacoatiara Road, km 134), A. Loureiro et al. (10/07-73)(INPA 39519) (INPA) (near Manaus), 27/04-73 (INPA 37809), M. F. Silva et al. 163 (INPA), 733 (INPA) (estrada Manaus - Porto Velho).

47. Strychnos cogens Bentham, Jour. Bot. Hook. 3:241. 1841.

Brazil: Amazonas: basin of the upper Rio Negro, M. F. Silva et al. 1273 (INPA), 1369 (INPA).

53. Strychnos fendleri Sprague & Sandwith, Kew Bull. 1927:129. 1927.

Brazil: Roraima: between Boa Vista and Bom Fim (Guiana), Murça Pires & P. Leite 14687.

This is the first record of this species from Brazil.

Prof. G. B. Marini-Bettolo in his letter to me of February 2, 1976, writes: "it contains four new alkaloids of the strychnobrasiline and strychnosplendine group, and two known, i.e., diaboline and acetyl diaboline. One more must be identified."

55. Strychnos rubiginosa A. DeCandolle in DeCandolle, Prodr. 9:16. 1845.

Brazil: Mato Grosso: Chapada dos Guimarães (cerrado), Prance et al. 18828 (INPA).

56. Strychnos parvifolia A. DeCandolle in DeCandolle, Prodr. 9:16. 1845.

Brazil: Maranhão: Loreto, George and Liene Eiten 10522; Bahia: munic. Serra Geral de Goias (chapada, entre las Estados de Goias e Bahia), Gottsberger 122-24771; Goias: Chapada dos

Veadeiros, W. R. Anderson et al. 6426; Para: basin of Rio Tocantins, Ribeiro & Nascimento 12 (IAN).

57. Strychnos fulvotomentosa Gilg in Engler, Bot. Jahrb. 25. Beibl. 60:40. 1898.

Brazil: Guanabara: Morro da D. Marta, Duarte s.n. (J.B.R.J. 114845) (MO).

58. Strychnos acuta Progel in Mart. Fl. Bras. 6(1):280. 1868.

Brazil: São Paulo: Mondagua, no pe da Serra do Mondagua, mata virgim, J. Mattos 11810 (HB).

59. Strychnos brasiliensis (Sprengel) Martius, Flora 24. Beibl. 2:84. 1841.

Brazil: Rio de Janeiro: Sucre 4049, 4148 (Petropolis), Brade 18666 (Correias); Parana: J. C. Lindeman & Haas 582 (U), 712 (U), 842 (U), 1198 (U), 1519 (U), 1626 (U), 2005 (U), 2199 (U), 2242 (U), 2292 (U), 3471 (U), 3568 (U), 3728 (U), 4838 (U), 5338 (U). Argentina: Corrientes, Santa Tome, A. Krapovickas et al. 17041 (GH).

63. Strychnos brachistantha Standley, Field Mus. Publ. Bot. 12:412. 1936.

Belize: Toledo: Croat 24384; Cayo: Croat 23713, Al. Gentry 8590.

65. Strychnos mattogrossensis S. Moore, Trans. Linn. Soc. II. 4:392. 1895.

Brazil: Amazonas: Albuquerque et al. 976 (Furo do Castanha-Mirim), A. Loureiro et al. s.n. (INPA 37570). Peru: Loreto: Maynas, Indiana, McDaniels & Rimachi 17328.

66a. Strychnos alvimiana Krukoff & Barneby, Phytologia 27:105. 1973.

Brazil: Bahia: km 7 da rodovia Itacare-Taboquinhas, T. S. Santos 2683.

Fruits of this species are described for the first time.

Mature fruits subglobose, 2.5-3 cm diam, mucronate at apex; shell ±5 mm thick, hard, dull, tuberculate; seeds discoid, ±18 x 14 mm, the testa separating from the shrunken endosperm and enclosing it as a sac; fruiting pedicels ±2 mm in diam.

67. Strychnos schultesiana Krukoff, Mem. N. Y. Bot. Gard. 12(1):78. 1965.

Venezuela: Merida: ±5 km NNE of La Azulita, valley of Capaz River, cult., J. de Bruijn 972 (MER).

69. Strychnos poeppigii Progel in Mart. Fl. Bras. 6(1):282. 1868.

Brazil: Amazonas: basin of Rio Purus, Lago Marraha, varzea, Prance et al. 21208. Peru: Loreto: McDaniel & Rimachi 17810 (maynas, Mazan), 17828 (Maynas, Indiana), Rimachi 681 (Maynas, Iquitos), 1086 (Nauta).

70. Strychnos tarapotensis Sprague & Sandwith, Kew Bull. 1927:131. 1927.

Peru: Huanuco: Pachitea, Dtto Honoria, Schunke 2522 (F); San Martin, Mariscal Caceros, Schunke 6495, 7186, 7594, 7636; Amazonas: Rubio Kayap 375, 667, 880, 1040, 1398, Ernesto Ancuash 718, Berlin 1664, 1862.

All collections are from shrubs 1-3(6) m high, growing at elevations of (215)250-500(700) m. The common names reported are: "Sacha Chija" and "Naranjillo" (San Martin), "Jikog," "Tsacik" and "Hiikan" (Amazonas).

This is the first record of this species from Amazonas (Peru).

APPENDIX VII (SUPPLEMENT)

Changes in the identifications

	Cited originally as	Cited later as
J. Bot. Rio 86670 (Markgraf 10058)	parvifolia 8 suppl.:64	brasiliensis 8 suppl.:67
Brade 18666	parvifolia 8 suppl.:64	brasiliensis 14 suppl.:

LIST OF EXSICCATAE

The first List of Exsiccatae covering my papers on Strychnos, including Supplement 11, was published in Lloydia 35(3):262-270. 1972. The present List of Exsiccatae covers Supplements 12, 13, and 14. The number in parentheses corresponds with the species-number of this and other papers (Supplements 12, 13, and 14). Only numbered collections and those of which the dates of collection are recorded have been listed. Collections identified with doubts are not listed. If a collector gathered his collection together with others, only his name is cited in this list. Collections with Dr. Prance's numbers are cited under Prance.

Agostini, Getulio, 1525 (35), 1526 (35). 534 (39),
Albuquerque, de, Byron W. P., 517 (39), 529 (39), 976 (65).
Almeida, J., 19 (57a), 128 (15), 165 (57a).
Ancuash, Ernesto, 276 (3), 718 (70).
Anderson, W. R., 6426 (56), 6601 (33), 7813 (11), 8008 (25), 8356 (39), 9034 (25), 9873 (39), 10598 (40), 10805 (39), 10879 (39), 10987 (26), 11038 (39).
Aviles, Silvestre, 13b (12).
Ayala, F., 704 (38).

Barquero, Humberto, s.n. (13/11-1973) (1), s.n. (13/11-1973) (13).
Barrett, Geo., Jr., 3437 (32a).
Belem, Romeu P., 3503 (57a), 3512 (66a), 3703 (57a), 3708 (66a).
Berlin, Brent, 1664 (70), 1716 (36a), 1862 (70).
Bernardi, A. L., 2467 (53), 2501 (53), 7230 (36a), 7339 (36a), 7687 (12), 7697 (65).
Biocca, s.n. 1963 (35).
Blanco C., Carlos A., 1085 (39).
Brade, A. C., 18666 (59).
Bristan, Narciso, 1264 (32a).
Bruijn, de, J., 972 (67).
Busey, P., 700 (12).

Cavalcante, P. B., 3099 (40).
Comision de Dioscorea, P. 84 (13), 2721 (13), 3704 (13), 4010 (13), 5644 (13).
Croat, T. B., 5429 (12), 10229 (12), 10339 (19), 12595 (12), 14474 (63), 15073 (12), 16775 (32a), 17776 (65), 17921 (69), 18854 (38), 19257 (43), 19648 (38), 19648a (65), 20419 (38), 20461 (32), 20469 (49), 20481 (32), 22757 (32a), 23713 (63), 24206 (31), 24384 (63), 27113 (19).

Duarte, A. P., 6448 (57).
Duke, J. A., 8166 (43), 8190 (32a), 8782 (32a), 11095 (12), 14576 (32a).
Dwyer, John D., 8436a (38), 8439 (38), 8453 (12), 9111 (38).

Eiten, George, 10522 (56).

Forero, Enrique, 1251 (32a), 1489 (32a), 1524 (32a).
Foster, Robin, 535 (12), 1089 (19), 1465 (38), 1596 (38), 1824 (43), 1946 (19), 1970 (12), 2153 (19).
Froes, R., 12712 (57a), 12715 (57a), 12734 (57a), 12735/91 (66a), 20036 (57a), 33638 (6).
Fuchs, H. P., 21814 (12), 22273 (3).

Garcia-Barriga, H., 14021 (10), 14060 (8).
Gentry, Al., 5750 (12), 6386 (1), 6392 (19), 7717 (63), 7765 (63), 8114 (63), 8456 (31), 8590 (63), 12893 (6), 13222 (39), 13229 (27), 23595 (63).
Goes, O. C., 978 (56).
Gottsberger, Ilse S., 65RI (25), 122-24771 (56), s.n. (11/2-1971) (25).
Granville, de, 753 (52), 1284 (18), B3847 (40).

Harley, R. M., 10842 (31).
Hatschbach, G., 15489 (59), 16581 (59), 30032 (43).

Irwin, H. S., 25236 (25), 25788 (25), 26638 (25), 28011 (25), 30675 (55), 31894 (42), 32044 (25), 34715 (25).

Jaramillo, 1310 (32a).

Kayap, Rubio, 179 (24), 375 (70), 667 (70), 880 (70), 1040 (70), 1230 (24), 1398 (70).
Kennedy, Helen, 1223 (12), 1919A (1), 2159 (32a), 2159a (3), 2555 (43).
Klein, R., 3384 (59), 4238 (59), 4277 (59), 6593 (59), 7722 (59).
Krapovickas, A., 17041 (59).

Lanjouw, J., 638 (32).
Lent, Roy W., 430 (38).
Lescure, 18 (18).
Liesner, R. L., 1037 (38).
Lindeman, J. C., 582 (59), 712 (59), 842 (59), 1198 (59), 1519 (59), 1626 (59), 2005 (59), 2199 (59), 2242 (59), 2292 (59), 3471 (59), 3568 (59), 3728 (59), 4497 (55), 4838 (59), 5338 (59).
Lisboa, P., 571 (31).
Lizot, Jacques, 106 (32).

Loureiro, A., s.n. (27/04-1973) (46), s.n. (10/07-1973) (46).
Luteyn, James L., 921 (12).

Maas, P. J. M., 552 (32).
Mathias, Mildred E., 3584 (69), 5998 (69).
Mattos, J., 11810 (58).
McDaniel, S., 17328 (65), 17810 (69), 17828 (69), 18403 (38).
Mello Filho, Luiz Emygdio de, 1113 (64), 3000 (31), 3001 (56), 3002 (54), 3004 (5), 3145 (59).
Molina, Antonio, 24800 (13).
Montgomery, Gene, 97 (38).
Mori, S., 2169 (43), 2908 (43), 3058 (43), 3318 (1), 5387 (32a), 6228 (12).
Muller, Fritz, 23 (59).

Nee, M., 11077 (19).

Oldeman, R. A. A. T., 293 (6), B-991 (39), 1988 (44a), B-3614 (32).

Pena, Bento, S., 246 (9), 336 (39), 461 (26), 551 (6).
Pires, João Murça, 7891a (10), 12227 (32), 12287 (26), 12386 (32), 12454 (14), 12505 (26), 12614 (32), 13984 (39), 14687 (53), Maguire number series 51249 (16).
Poveda, L. J., s.n. (9/8-1975) (1).
Prance, G. T., 22506(6), 2558 (10), 11539 (7), 11578 (41), 11617 (39), 12690 (24), 12743 (39), 13099 (43), 13131 (43), 13474 (69), 13865 (6), 13929 (28), 13961 (6), 14331 (36b), 14962 (29), 15549 (39), 16362 (69), 17673 (24), 17690 (41), 18127 (24), 18402 (39), 18651 (32), 18828 (55), 19452 (39), 20581 (32), 21208 (69), 21617 (21), 21618 (39), 21832 (39), 21937 (39), 22104 (46), 22260 (36a), 22730 (2), 22731 (8), 23126 (46), 23153 (4).

Ratter, J. A., 1467 (9).
Reitz, P. R., 14483 (59), 16900 (59).
Ribeiro, B. G. S., s.n. (10/3-1971) (26), 12 (56), 116 (40), 250 (24), 381 (39).
Rimachi, 302 (43), 681 (69), 786 (38), 1086 (69).
Rodrigues, W., 9182 (27).
Rodriguez, F. M., 30/2031 (59).
Rosengurtt, 9458 (59).

Santos, de, R. R., 1753 (31).
Santos, T. S., 727 (57), 1062 (65), 1250 (19), 1489 (58), 1757 (66a), 2055 (57a), 2683 (66a).
Sarukhan, J., 3510 (63), 3642 (63).

Schunke, V., Jose, 2522 (70), 2540 (70), 2611 (70), 2900 (70), 3495 (70), 3986 (70), 4007 (70), 4332 (70), 4562 (37), 4740 (32), 4765 (70), 5018 (10), 5021 (10), 5134 (70), 5135 (3), 5216 (39), 5219 (31), 5433 (24), 5434 (70), 5633 (40), 5763 (71), 6495 (70), 6512 (70), 6658 (3), 7186 (70), 7594 (70), 7636 (70).
Silva, M. F., 60 (24), 163 (46), 733 (46), 1249 (32), 1262 (32), 1273 (47), 1368 (39), 1369 (47), 1442 (39), 1444 (32), 1551 (6), 1673 (39).
Silva, Nilo T., 3237 (27), 3534 (10), 3873 (6), s.n. (28/4-1969) (10), 3869 (39).
Smith, R. F., V4260 (53).
Soejarto, D. D., 2425 (6).
Souza, Mario, 1528 (13).
Steyermark, J. A., 101681 (12), 105653 (12).
Sucre, D., 3232 (11), 4049 (59), 4148 (59), 4699 (11), 4703 (58).

Ventura, A. F., 2984 (13), 3548 (13), 3554 (13).
Villarreal da Puga, 2935 (12).

Williams, L. O., 28692 (31).

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109p Marini-Bettolo, G. B., et al. On the alkaloids of Strychnos XXVI. The alkaloids of Strychnos medeola Sagot ex Progel. Structure and configuration of normacusine B by spectral data. Gazzetta Chimica Italiana 103:591-597. 1973.

109q Marini-Bettolo, G. B., et al. Sugli alcaloidi di Strychnos XXVIII. Gl: alcaloidi di Strychnos amazonica Krukoff e di Strychnos brachiata Ruiz and Pavon. Annali di Chimica 63:849-853. 1973.

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