

SUPPLEMENTARY NOTES ON THE AMERICAN SPECIES

OF STRYCHNOS. XIII.

B. A. Krukoff⁽¹⁾ and R. C. Barneby⁽²⁾

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Introduction

Since the last of this series of papers was submitted for publication 112 new collections became available. Specimens from Herbier du Centre Cayenne (CAY) and Centro de Pesquisas do Cacao, Bahia, Brazil (UB) were of particular interest. We have suggested on several occasions that French Guiana and the State of Bahia in Brazil are the regions where new species of *Strychnos* could be expected.

The newly examined collections contribute to our knowledge of some species; extensions of ranges are noted for eight; and three, *S. cayennensis* Krukoff & Barneby, *S. recognita* Krukoff & Barneby and *S. alvimiana* Krukoff & Barneby, are described as new.

(1) Consulting Botanist of Merck Sharp & Dohme Research Laboratories, Rahway, New Jersey.

(2) Honorary Curator of Western Botany, The New York Botanical Garden.

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

Costa Rica: Puntarenas: Osa Peninsula, across from TSC Field Station "Agua Buena", Helen Kennedy 1919A (MO). Panama: San Blas: mainland opposite Playón Chico, 0-3 miles from Caribbean, Al. Gentry 6386 (frts-Oct.) (MO).

This is the first record of the species from Panama.

5. Strychnos romeu-belenii Krukoff & Barneby, Mem. N. Y. Bot. Gard. 20(1):22. 1969.

Brazil: Bahia: Itabuna, Mello Filho 3004 (R).

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

Colombia: Amazonas-Vaupés, Rio Apaporis, García-Barriga 14060 (US).

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

Colombia: Amazonas-Vaupés, Rio Apaporis, García-Barriga 14021 (US).

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

Brazil: Rio de Janeiro: D. Sucre 3232 (RB), 4699 (RB), coll. undesign. s.n. (372-1970) (RB).

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

Panama: Chiriqui: P. Busey 700 (MO); Canal Zone: Barro Colorado Island, Dwyer et al. 8453 (MO), Silvestre Aviles 13b (MO), Croat 5429 (MO), 10229 (MO), 12595 (MO); Panama: Taboga Island, Al. Gentry 5750 (MO). Venezuela: Zulia: Sierra de Perija, alt. 1470-1560 m, Steyermark & Dunsterville 105653.

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

Mexico: Veracruz: 3 kms NE of El Palmar, Comisión de Dioscóreas P84 (MEXU); Tabasco: near Villahermosa, Comisión de Dioscóreas 4010 (WIS); Oaxaca: Comisión de Dioscóreas 5644 (Temazcal) (MEXU), Mario Souza 1528 (Tuxtepec) (MEXU).

15. Strychnos bahiensis Krukoff & Barneby, Mem. N. Y. Bot. Gard. 20(1):29. 1969.

Brazil: Bahia: Marau a Ubaitaba, J. Almeida & T. S. Santos 128 (UB).

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

French Guiana: Tumuc Humac, de Granville 1284 (CAY).

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

Panama: San Blas: Al. Gentry 6392 (MO); Canal Zone: Barro Colorado Island, Croat 10339 (MO). Brazil: Bahia: Ipiáu, estrada a Jequie, T. S. Santos 1250 (UB).

This is the first record of this species from Bahia.

20. Strychnos tomentosa Benthams, Jour. Linn. Soc. 1: 104. 1856.

Brazil: Roraima: Justino Gomes s.n. (Jard. Bot. Rio 24104 (RB)).

The collector notes on the label: "Região do Alto Rio Branco, fronteira da Guiana Inglesa, fornece curare".

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

Peru: Loreto: Coronel Portillo, Schunke 5433.

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

Brazil: Bahia: Serra do Tombador, + 22 km W. of Morro do Chapéu, ca 1000 m, Irwin et al. 30675; Goiás: Irwin et al. 25236 (Contraforte Central, ca 27 km NE of Catalão, alt. 875 m), 32044 (Serra Geral do Paraná, + 10 km S. of São João de Aliança, ca 950 m); Minas Gerais: Irwin et al. 25788 (Serra dos Oculos, ca 55 km NE of Patrocínio, ca 1050 m), 28011 (Serra do Espinhaço, ca 25 km E. of Diamantina, ca 790 m); Distrito Federal: ca 2 km E. of Lago Paranoá, DF-6, ca 1000 m, Irwin et al. 26638.

These are new records of the species for the State of Bahia and Distrito Federal.

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

Mildred E. Mathias called to our attention that the type of S. amazonica was collected by Carlos Schunke (not by J. Schunke V. as stated in 7f:227).

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

Belize: Cayo District: south of Belmopan, Al. Gentry 8456 (MO). Brazil: Bahia: Itabuna, Mello Filho 3000 (R). Peru: Huanuco: Leoncio Prado, Schunke 5219.

The first record of this species from Peru.

32. Strychnos erichsonii Richard Schomburgk, Reisen 3:1082, hyponym. 1848; Mart. Fl. Bras. 6(1):274. 1868.

Panama: Colon: ca 2-3 miles up the Rio Guanche, Helen Kennedy & Robin Foster 2159 (MO). Surinam: Matawaribo, P. J. Maas & H. Maas 552. Peru: Loreto: Rio Tacsha Curaray, Croat 20461 (MO), 20481 (MO).

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. It has been collected in Panama on two occasions, in sterile condition (Croat 16775 and Duke 8782) and on three occasions in fruit (Duke 14576, 1264 and Kennedy & Foster 2159). The collections are from San Blas, Colon and Darien. Flowers are needed to check on the above suggestion.

35. Strychnos bredemeyeri (Schultes) Sprague & Sandwith, Kew Bull. 1927:126. 1927.

Brazil: Amazonas: basin of Rio Negro, Serra do Onori, Biocca s.n. (1963) (R).

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

Costa Rica: Puntarenas: Osa Peninsula, Roy W. Lent 430 (F). Panama: Veraguas: northern tip of Coiaba Island, Robin Foster 1596 (A); Canal Zone: Barro Colorado Island, Roy W. Lent 430 (F), Foster 1465 (MO), Dwyer et al. 8436a (MO), 8439 (MO), 9111 (MO), 15079 (MO). Peru: Loreto: Rio Itaya, Croat 18854 (MO), 19648 (MO).

This is the first record of the species from province of Veraguas, Panama.

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

French Guiana: River Approuague, Oldeman B-991 (CAY).

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

Peru: San Martín: Mariscal Cáceres, Schunke 5633.

The first record of this species from Peru.

42. Strychnos bicolor Progel, Vidensk. Meddel. 1869: 31. 1869.

~ Brazil: Goiás: Serra Geral do Paraná, + 3 km of São João da Aliança, alt. 850 m, Irwin et al. 31894.

The new record for the State of Goiás.

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

Panama: Panama: Kennedy 2555 (MO); (?) Darien: Duke 8166 (MO). Peru: Loreto: Croat 19257 (MO).

- 44a. Strychnos cayennensis Krukoff & Barneby, sp. nov.

Ad sectionem Rouhamon referenda, S. guianensi affinis, sed stylo pilosulo nec glaberrimo absimilis.

Macroscopic: petioles 3-5 mm long; blades more or less elliptic, 7-14 x 2.8-4.2 cm, obtuse or acute at base, long-acuminate at apex, usually dull on both surfaces, chartaceous, usually 3-plinerved with the inner pair subopposite and diverging at 0-8 mm from base, principal nerves impressed, reticulation prominent on both surfaces. Microscopic: petioles and blades are essentially glabrous on all parts.

Inflorescences axillary, few (+ 5-9)-flowered, the primary axis minutely pilosulous up to 1 cm long, peduncles almost 0, pedicels 1-2(3) mm; sepals broadly to narrowly ovate, glabrous dorsally, ciliate, + 1.5 mm long; style 6-6.5 mm long, pilosulous to near middle, ovary hispidulous from middle up.

Fruits (immature) with thin shells, 1 or 2 seeded.

French Guiana: Montagne Boeuf Mort, Saul, Oldeman
1988 (CAY-holotype).

No tendrils are available on the specimens examined and the collector describes the plant as "arbre, env. 9 m de haut". This may be an error as we suspect that this is a liana with tendrils.

Of the 4 species of Sect. Rouhamon with pilose style, S. hirsuta, unlike ours, has hirsute leaves, S. cogens and S. goiasensis have glabrous ovary, while S. melinoniana has leaves with principal nerves raised above (not deeply impressed).

S. guianensis, to which our species is closely related, is extremely polymorphic in vegetative characters but it always has a glabrous style and ovary. Pubescence of its leaves is variable; they may be universally puberulent with very short, adpressed, straight hairs, or pubescent with much longer erect, curved hairs, or with any or several intermediate states. Furthermore the pubescence is more dense in axils of the inner principal nerves, thus occasionally giving a barbate appearance, and not essentially glabrous on all parts.

Mr. Oldeman wrote as follows on July 1973 concerning Montagne Boeuf Mort and Saul where the new species was discovered: "Montagne Boeuf Mort is the hill which is nearest to the field station in Saul... The whole Saul region is extremely interesting floristically; there are reasons to believe that it forms part of one of the South-American "forest refuges" in geological periods with a drier climate. Menispermaceae and Strychnos are not the only ones giving rise to surprises in this region but also plants of other groups. There are also other indicators for this hypothesis".

49. Strychnos parviflora Spruce ex Benth, Jour. Linn. Soc. 1:107. 1856.

Peru: Loreto: Rio Tacsha Curaray, Croat 20469 (MO).

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

Venezuela: Bernardi 2467 (MER), 2501 (MER).

54. Strychnos atlantica Krukoff & Barneby, Mem. N. Y. Bot. Gard. 20(1):61. 1969.

Brazil: Bahia: Itabuna, Mello Filho 3002 (R).

56. Strychnos parvifolia DC., Prodr. 9:16. 1845.

Brazil: Bahia: Itabuna, Mello Filho 3001 (R).
Rio de Janeiro: Goes & Dionisio 978 (RB).

57. Strychnos fulvotomentosa Gilg, Bot. Jahrb. 25 (Beibl. 60):40. 1898.

Brazil: Bahia: Itacaré, beira-mar, T. S. dos Santos 727 (UB). Rio de Janeiro: A. P. Duarte 6448 (RB).

- 57a. Strychnos recognita Krukoff & Barneby sp. nov.

Juxta S. fulvotomentosam Gilg ponenda, sed ab ea foliorum adultorum venationibus primaria ac secundaria valde impressis necnon inflorescentia arcte conferta absimilis.

Macroscopic: branchlets with tendrils; petioles 4-10 mm long; blades more or less elliptic, 4-14 x 2-4 cm, rounded or obtuse at base, gradually acuminate at apex, shining above, dull and pale beneath, subcoriaceous to coriaceous, 5(3)-plinerved with the inner pair subopposite or alternate and diverging at 0-8 mm from base, principal nerves and secondaries deeply impressed above, reticulation prominulous on both surfaces. Microscopic: petioles pubescent with rusty hairs; blades glabrescent or glabrous in age, barbate with rusty subhirtellous hairs in axils of principal nerves below, above puberulent to pubescent on midrib, otherwise glabrous.

Peduncles terminal to branchlets, 1.5-3 cm long; inflorescence compactly cymose, + 1-1.5 cm diam, the calyces contiguous even at late anthesis; flowers 4-merous; sepals ovate-acuminate, 2.5-2.7 x 0.7-0.8 mm, hispidulous dorsally and ciliolate, the tips recurved; corolla densely minutely hispidulous externally, 2.5 mm long, the internally glabrous tube 1.2 mm, the ovate lobes 1.3 mm long, + 1 mm wide, within barbate in an ascending arc; filaments inserted at sinuses of corolla, 0.4 mm long; anthers 0.9 mm long, barbate at base; ovary and style glabrous.

Brazil: Jard. Bot. Rio Jan. 46321. Bahia: Froes (field number 90) Krukoff Herbarium 12734 (renumbered at IAN as Froes 19930), (collected on March 15, 1943); (field number 104) Krukoff Herbarium 12715 (renumbered at IAN as 20033) (March 16, 1943); (field number 106) Krukoff Herbarium 12712 (renumbered at IAN as 20034) (all collected near Bom Gosto, Ilheos); Froes 20036 (Ilheos, estrada para Olivença) Romeu P. Belem 3503 (Marau, mata litorânea, margeon de Igarapé) 3703 (Una, fazenda São Raphael, margeon do Rio Una, mata costeira); J. Almeida & T. S. Santos 165 (NY-holotype, UB) (Itacaré, ramal da barragem, collected on Oct. 17, 1968), 19 (Saida Itabela-Guaratinga, collected on Sept. 13, 1969). Espírito Santo: Vale do Rio Doce, km 30 a 40 da Rod. Linhares a povoação ao Linhares, T.S. Santos 2055 (UB) (collected May 10, 1971).

In the diagnosis S. recognita is compared to S. fulvotomentosa, which it resembles in its terminal inflorescence and short style, characters common to members of sect. Breviflorae. The new species differs from S. fulvotomentosa in its densely congested inflorescence and in the deeply impressed primary and secondary nerves of the mature leaf-blades. Leaves of this type are unknown elsewhere in sect. Breviflorae but are very closely matched by leaves of S. solimoesana, an allopatric (Amazonian) member of sect. Longiflorae with the axillary inflorescences of its group. The resemblance is so close that sterile material of S. recognita (4 collections) have for more than 30 years lain in the herbarium under the name S. solimoesana, although there has always been some question as to their identity. The type-collection of S. recognita is the first flowering specimen to come to hand and the description is based primarily on this material.

A curious feature of the type is the disposition of the tendrils, some of which are opposed to developed leaves, while others are modified from one of the first branches of the cymose inflorescence.

Label on 3503 reads: "cipo algo erecto caule espinhosa", on 3703 - "cipo sobre arvore de 30 m de altura, tronco com 10 cm de diam.", on 165 - "arbusto de 2 m de altura, infl. creme, gavinhas no ramos terminais".

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

Brazil: Espirito Santo: Linares, vale do Rio Dulce, T. S. dos Santos 1489 (UB); Rio de Janeiro: D. Sucre 4703.

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

Brazil: Fritz Muller 23 (WIS); Paraná: Mello Filho 3145; Hatschbach 15489 (US), 16581; Santa Catarina: Reitz & Klein 14483 (US), (Anita Garibaldi), 16900 (US) (Liso Guaraciaba), Klein 3384 (US) (Rio dos Patos), 4238 (US), 4277 (US) (Lacerdopolis), Klein & Broselin 6593 (US) (Pantano do Sol), 7722 (US) (Morro Costa da Lagoa); Rio Grande do Sul: Rosengurtt et al. 9458 (F). Argentina: Misiones: Posadas, F. M. Rodriguez 30/2031 (F).

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

Mexico: Puebla: Mesa Metate, Sarukhan et al. 3510 (MEXU), 3642 (MEXU). Belize: Cayo District: Gentry 23595 (MO), Al. Gentry 7717 (MO), 7765 (MO); Toledo District: Al. Gentry 8114 (MO). Panama: Canal Zone: Barro Colorado Island, Croat 14474 (MO).

64. Strychnos nigricans Progel, Mart. Fl. Bras. 6(1):280. 1868.

Brazil: Rio de Janeiro: Mello Filho 1113 (R).

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

Brazil: Bahia: Itacaré, T. S. Santos 1062. Peru: Loreto: Croat 17776 (MO), 19648a (MO).

- 66a. Strychnos alvimiana Krukoff & Barneby sp. nov.

Juxta S. mattogrossensem, S. nigricantem, ac S. cerradoensem inserenda, ab omnibus calycis lobis longissimis anguste lanceolatis cito distincta.

Macroscopic: branchlets armed with small (+ 5 mm long) curved spines; petioles + 1.4-1.8 mm long; blades usually elliptic, 7.5-9 x 4.5-5 cm, rounded to obtuse at base, acuminate at apex, dull on both surfaces, chartaceous to subcoriaceous, 3-plinerved with the inner pair subopposite or alternate and diverging at 0-7 mm from base, principal nerves impressed, reticulation faint on both surfaces. Microscopic:

branchlets, petioles and blades essentially glabrous in all parts; leaf-blades not verrucular above or beneath and without a membranaceous pocket beneath in axils of the inner principal nerves.

Peduncles 2.5-4.5 cm long, terminal to branchlets; inflorescence openly branched, 3.5-5 cm diam, the ultimate cymules dense; lower bracts narrowly lanceolate, up to 7-12 mm long, the upper ones progressively shorter; calyx 4-4.5 mm long, the tube ± 0.8 mm, the lobes narrowly lance-acuminate, $\pm 3-3.5 \times 0.4-0.6$ mm, minutely puberulent along margins, otherwise glabrous; ovary and style glabrous, the latter ± 2 mm long.

Corolla and fruits are not known.

Brazil: Bahia: T. S. Santos 1757 (UB-holotype) (lvs & flrs past anthesis, 13/7-71) (Itacaré Rod. Barragem), Froes 12735/91 (Bom Gosto, Ilheos), Belem 3512 (Marau, mata litorânea, margem de Igarapé), 3708 (Una, saída para Olivença, mata Costeira).

Until the fruit of S. alvimiana becomes known the systematic position of the species within sect. Breviflorae will remain somewhat precarious, but it appears on other grounds to resemble the three members of subsect. Eriospermae. All of these have comparatively short calyx-lobes, the longest, in S. cerraodensis, reaching 1.6-1.8 (not 3-3.5) mm in length. Other sympatric Breviflorae differ greatly in either pubescent (or verrucular) foliage, or small leaf-blades, or in compactly cymose inflorescences, or in a shrubby habit of growth, or in some combination of these characters. S. alvimiana is a liana with comparatively large, fully glabrous leaves, its branchlets armed with short curved spines. A feature common to S. alvimiana and the three Eriospermae but absent from other Breviflorae is the tetragonal section of young shoots arising from old stumps.

The collector states on the label of the type collection: "trepadeira sobre arvore fl. verde adulta. Mata".

Of the four collections cited above only the type collection is fertile.

This species is named in honor of Dr. Paulo de T. Alvim who extended to us the privilege of studying the important collection of Strychnos made in the State of Bahia.

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

Peru: Loreto: Mathias 3584 (F) and 5998 (F) (near Aguaytia); Croat 17921 (M) (Rio Paranapura above Yurimaguas).

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

Peru: Loreto: Coronel Portillo, Schunke 2611 (F), 5434: San Martín: Furdo Correviento, 527 m, Schunke 6512 (F).

APPENDIX VII (SUPPLEMENT)

Changes in the identifications

	Cited originally as	Cited later as
Garcia-Barriga 14021(sterile)	<u>erichsonii</u> (7d:181)	<u>brachiata</u> (13th Suppl.)
" " 14060(sterile)	<u>peckii</u> (7b:42)	<u>barnhartiana</u> (13th Suppl.)

BIBLIOGRAPHY

(In order to conserve space, we are citing here only the papers which are not cited in Supplements VII-XII).

- 7f. Krukoff, B. A. American species of Strychnos. Lloydia 35:193-271. 1972.

- 7g. Krukoff, B. A. Supplementary notes on the American species of Strychnos XII. Phytologia 25:49-54. 1972.



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