

NEW SPECIES OF LEGUMINOSAE, LAURACEAE, AND MONIMIACEAE,
AND NEW COMBINATIONS IN BIGNONIACEAE
FROM WESTERN ECUADOR

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Among the many new species from the Rio Palenque Biological Station are several in groups for which no specialist is available. Some of these are represented by incomplete material, but three of them are adequately distinguished for species description. These are an *Inga* (Leguminosae), a *Persea* (Lauraceae) and a *Siparuna* (Monimiaceae).

LEGUMINOSAE

Inga riopalenquensis A. Gentry sp. nov. (Plate 12:A).

A *Inga caldasiana* Britton & Killip corolla glabra et calyce parvo, in illa, a *I. coruscans* Willd. foliis 8-foliolatis recedit.

Medium-sized to large tree. Branchlets subterete but slightly angular, striate, puberulous, with scattered pale lenticels. Leaves (6-)8(-10)-foliolate, the rachis unwinged, the leaflets elliptic, the base rounded, apex acute, slightly puberulous only along main veins above and below, otherwise glabrous, chartaceous, 15-25 cm long, 8-10 cm wide, the petiolules ca. 2 mm long. Inflorescence narrowly spicate, to 14 cm long, the flowering portion much longer than peduncle, the calyx 1 mm long, puberulous, cupular, 5-denticulate, the corolla 5-6 mm long, puberulous, the flowers white, 7-9 mm long (with stamens). Fruit elongate-oblong, flattened, 19-36 cm long, 3-4.5 cm wide, the margins slightly raised, also with a raised projection over each seed.

TYPE: ECUADOR: LOS RÍOS: Río Palenque Science Center, km 47 between Santo Domingo de los Colorados and Quevedo, alt. ca. 200 m, wet forest; tree 10 m, flowers white, 6 March 1974, *Dodson 5463* (HOLOTYPE: MO; ISOTYPE: SEL, US, Río Palenque Science Center).

ADDITIONAL COLLECTIONS EXAMINED: (both from type locality): *Dodson 5228* (SEL), *Gentry 9961* (MO).

The tiny flowers and spicate inflorescence ally this plant with section *Bourgonia*. It is quite unmatched at MO. It is none of the species listed for section *Bourgonia* in Pittier's (1916) synopsis of the genus nor does it agree with any subsequently described species. In Leon's monograph (1966) it keys out with *Inga coruscans* Willd. on account of its open elongate floral rachis, unwinged petiole and large leaflets. None of the other species of section *Bourgonia* with elongate evenly floriferous rachises have 8-foliolate leaves with an unwinged rachis. Perhaps its closest relative is *Inga caldasiana* Britton & Killip which has a similar inflorescence 6-8 cm long but a glabrous corolla and smaller (0.7-0.8 mm long) calyx.

Persea theobromifolia A. Gentry, sp. nov. (Plate 12:B).

A congeneribus foliis oppositis, triplinervis multum differt.

Large canopy tree 30-40 m tall. Leaves uniformly opposite, elliptic, obtuse at base and apex, 3-veined from base, 10-22 cm long, 4-12 cm wide, glaucous beneath with a dense minute whitish scale, minutely lepidote-punctulate, otherwise glabrous or sparsely subpuberulous along main veins below, the petiole 1-2.5 cm long. Inflorescence axillary, paniculate, rather few-branched, to 8 cm long, puberulous. Flowers gray-green, the 3 sepals much

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smaller than petals, ca. 1 mm long, puberulous outside, perianth tube not developed, the 3 petals ca. 2.5 mm long, densely pilose inside, puberulous outside, the stamens with short (0.5 mm long) sparsely pilose filaments, the anthers 4-celled, ca. 0.5 mm long, the cells arranged in an arc, the inner series sterile, the pistil 1 mm long, the ovary globose, puberulous. Fruit large, obovoid, 8.5-10 cm long, 5.5 cm wide, with fleshy mesocarp and a single large seed ca. 5 cm long.

TYPE: *ECUADOR*: LOS RÍOS: Río Palenque Science Center, km 56, Quevedo-Santo Domingo, tropical wet forest, alt. 200 m; large tree 40 m tall, leaves glaucous on underside, flowers gray green, fruit reddish brown, 1 March 1973, *Dodson 5243* (HOLOTYPE: SEL, ISOTYPES: MO, US, Río Palenque Science Center).

ADDITIONAL COLLECTION EXAMINED: Same locality, treelet 3 m, leaves opposite, *Gentry 9683* (MO, QCA).

This new species is a most remarkable plant, totally unlike any other species of *Persea*, in its perfectly opposite (not at all subopposite), glaucous, strongly 3-veined leaves. The leaves are strikingly like those of some species of *Theobroma*. *Persea theobromifolia* belongs in subgenus *Eriodaphne* where it may constitute a new section. It agrees with section *Hexanthera* in the stamens of series III being sterile but with section *Aurantaea* in the pubescent ovary. In Kopp's monograph (1966) it keys to *Persea benthamiana* Meissn. under section *Aurantaea*, a species from Amazonian Brazil which is completely different in such major characters as sericeous leaf undersurface, glabrous filaments, and pinnately-veined leaves. Vegetatively *P. theobromifolia* is somewhat reminiscent of *P. meyeniana* Nees of Chile, which has a similarly glaucous and more or less 3-nerved leaf, but is completely different in floral characteristics.

Persea theobromifolia is locally called "caoba" and is the commercial mahogany of the region. That such an important timber tree has remained undescribed is another indication of the paucity of our knowledge of the wet forest flora of Pacific South America.

MONIMIACEAE

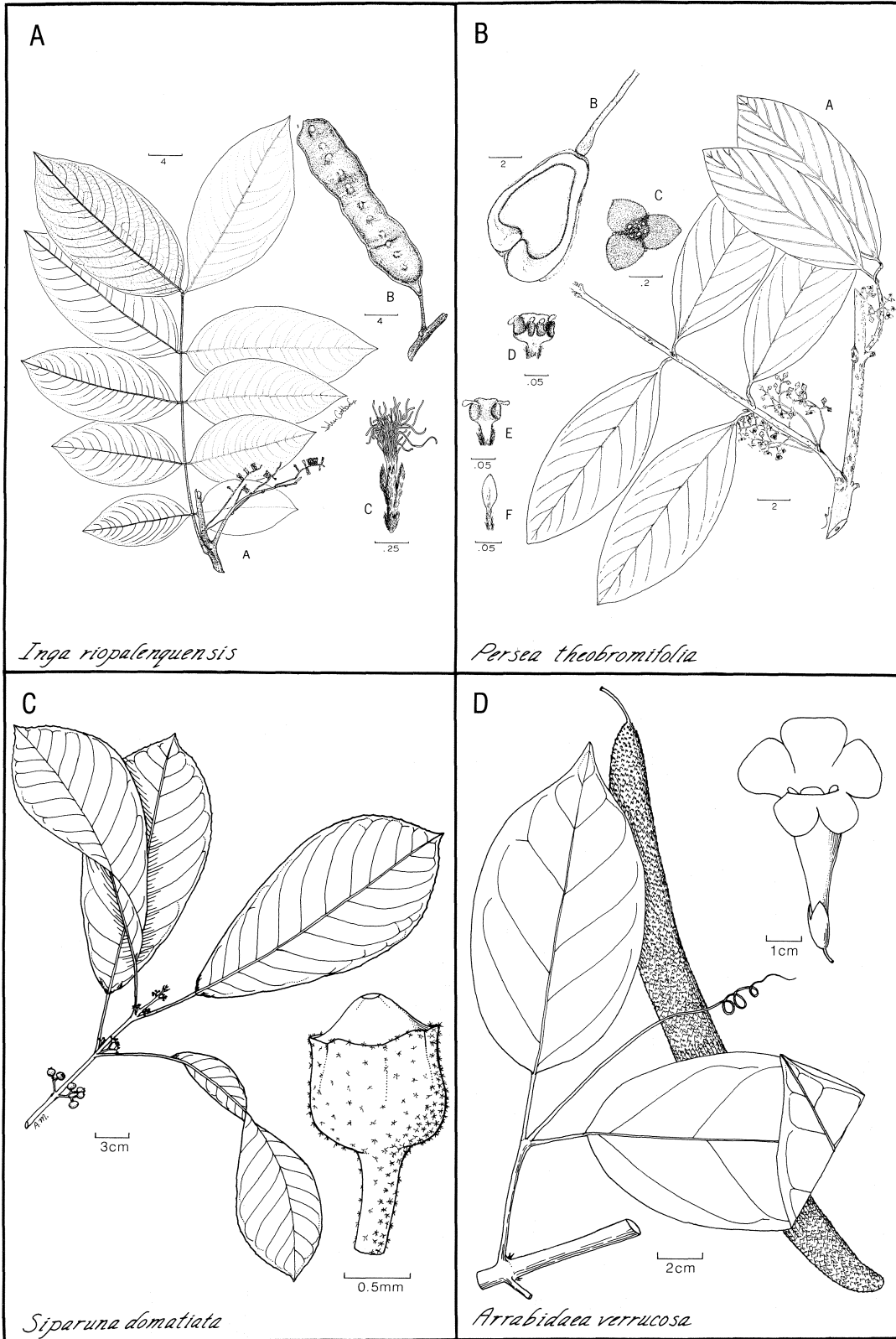
Siparuna domatiata A. Gentry, sp. nov.

(Plate 12:C).

Species foliorum basibus auriculatis domatiis a congeneribus diversa.

Small dioecious tree 2-4 m tall. Branchlets terete, stellate-puberulous. Leaves opposite, the blades membranaceous, elliptic to obovate, subentire, short acuminate, the base more or less auriculate with the saccate auricles forming hollow domatia, to 29 by 15 cm, rather glabrescently appressed stellate below and almost completely glabrescent above, secondary veins prominent above and below, petiole stellate puberulous, 2.5-6 cm long. Inflorescence of few-flowered axillary cymes, stellate-puberulous, the pedicels of male flowers ca. 1 mm long, the flowers with the receptacle obconic, 2-3 mm in diameter, the tepals obsolescent, fused and leaving only a minute orifice, the stamens ca. 6. Female flowers fewer per inflorescence, the receptacles obovoid, ca. 3 mm in diameter, the tepals fused leaving a minute orifice with a short cylindrical neck, the ca. 6-8 stigmas clearly exerted. Fruits globose when fresh, ca. 1.2 cm in diameter, light pink.

Plate 12:A-D. A, *Inga riopalenquensis* (after *Dodson 5463*). a, habit; b, fruit; c, flower. Dimensions in centimeters; B, *Persea theobromifolia* (after *Dodson 5243*). a, habit; b, fruit (longitudinal section); c, flower; d, stamen of series I; e, stamen of series II (2 additional valves not visible); f, staminode of series III. Dimensions in centimeters. C, *Siparuna domatiata*; D, *Arrabidaea verrucosa*.



TYPE: PANAMA: PANAMA: Primary forest along El Llano-Cartí Road ca. km above Pan-Am Hwy., alt. 200-500 m, "flowers" first green, then becoming yellow above, finally becoming orange, 26-27 March 1973, *Liesner 1198* (HOLOTYPE: MO; additional duplicates distributed as *S. nicaraguensis*).

ADDITIONAL COLLECTIONS EXAMINED: ECUADOR: LOS RÍOS: Río Palenque Science Center, km 56 Quevedo-Santo Domingo, 150-200 m; scandent shrub to 2 m, buds white, 18 March 1974, *Dodson 5508* (SEL, US, Río Palenque Science Center), treelet 3 m, off trail 3, 2 Oct. 1975, *Dodson & Gentry 6331* (MO, QCA, SEL). Mature forest on other side of Río Palenque from field station after crossing Río Bimbe and Río Waija, 170 m; shrub 2 m, fruits light pink, 7 Oct. 1976, *Dodson & Gentry 6532* (MO, QCA, SEL).

Siparuna is in great need of revision rendering description of new taxa in the genus generally inadvisable. However *S. domatiata* is so distinct that there seems no doubt that it is undescribed. No other species of *Siparuna* has domatia and, in fact, the leaf base domatia of *S. domatiata*, reminiscent of those of *Tococa* (Melastomataceae), are apparently unique in Monimiaceae. I have examined all material of this genus at F, MO, NY, and US and find only two species, *S. auriculata* DC. and *S. uleana* Perk., of Amazonian Peru with noticeable basal auricles. These species have more bullate hispid leaves and shorter more pubescent petioles than *S. domatiata* as well as being non-domatiate. The Ecuadorian collections, all female or in immature bud, have smaller, less developed domatia than the type and the leaf base is much less conspicuously auriculate. They could prove specifically distinct but additional material of the same sex and developmental stage is needed.

BIGNONIACEAE

Three new combinations are needed for Pacific Ecuadorian species of Bignoniaceae. Only one of these is known from Río Palenque but the other two might also be expected at the field station.

Schlegelia pandurata (Moldenke) A. Gentry, comb. nov.

Dermatocalyx panduratus Moldenke, *Phytologia* 2: 131. 1946. TYPE: ECUADOR: ESMERALDAS, 2 km S of San Lorenzo, *Little 6317* (NY).

It has been realized for some time that *Dermatocalyx* (described as Scrophulariaceae) and *Schlegelia* (generally considered Bignoniaceae) are identical, but the necessary transfer of poorly known *Dermatocalyx panduratus* to *Schlegelia* was never made. Described by its collector as a tree but probably a hemiepiphytic vine to judge from the reported vernacular name "mata palo" and the habit of its congeners, *S. panduratus* is unique in *Schlegelia* in having conspicuously auriculate leaf bases and its ribbed calyx is also very unusual. This species is now known from two collections, the Ecuadorian type and a second collection from adjacent Colombia [*Romero-Castaneda 5377* (COL) from Monte Alto, Nariño Dept.], both from the coastal wet forest.

Cydista decora (S. Moore) A. Gentry, comb. nov.

Anemopaegma decorum S. Moore, *Trans. Linn. Soc. London*, ser. 2,4: 421. 1895. TYPE: BRAZIL: MATO GROSSO, *S. Moore 980* (HOLOTYPE: BM, ISOTYPE: NY).

Clytostoma decorum Bur. & K. Schum., *Fl. Bras.* 8(2): 151. 1896. TYPE: BRAZIL: MATO GROSSO, *S. Moore 980* (BM, NY).

Arrabidaea decora (S. Moore) Hassl., Fedde Rep. 9: 49. 1910.

Clytostomanthus decorus (S. Moore) Pinchon, Bull. Soc. Bot. France 92: 224. 1945.

Although this species was described from Mato Grosso, Brazil, it has been collected most commonly from a range disjunction in western Ecuador. In Ecuador it is known from Guayas, Chimborazo, Manabi, and Los Ríos Provinces. Sandwith, who had not seen fruiting material ["fructus adhuc desideratur" sub *Gilmartin* 663 (US), det. 1965], retained the species in *Clytostoma* where it is somewhat anomalous in a smooth (not warty-muriculate) ovary, large foliaceous pseudostipules, and an interrupted pollen reticulum. Earlier Hassler (1910) transferred it to *Arrabidaea* citing a linear, smooth-surfaced fruit totally unlike the oblong, echinate fruit of *Clytostoma*, but Pichon (1945) rejected placement with *Arrabidaea* in which both its pollen type and foliaceous pseudostipules were out of place. Pichon's solution was a monotypic genus, *Clytostomanthus*, the major difference from *Clytostoma* being the *Arrabidaea*-like fruit cited by Hassler but not seen by Pichon. Hassler's fruiting collection [*Rojas s.n. (Hassler 10022)* (NY) from Paraguay] is now at hand proving both the accuracy of his description and the impossibility of retention of the species in *Clytostoma*. However, a new genus is unnecessary: the species belongs in *Cydista* where it is extremely close to *C. diversifolia* (HBK) Miers.

As is so often the case with such monotypic genera of Bignoniaceae, even specific recognition becomes questionable when the true generic affinities of a species are understood. *Cydista diversifolia*, which ranges from southern Mexico and Cuba to northern Venezuela, differs from *C. decora* in smaller flowers, a shorter, more broadly campanulate calyx, the ovules 2-seriate in each locule, gland fields in axils of basal secondary veins beneath, and usually a much larger inflorescence. The two are best considered specifically distinct. While the trans-Andean disjunction of *C. decora* is unusual, the more conspicuously bracteate inflorescence of the Ecuadorian population is too inconstant to support its specific segregation from the Paraguay/Mato Grosso form.

Arrabidaea verrucosa (Standl.) A. Gentry, comb. nov. (Plate 12:D).

Paragonia schumanniana Loes., Bot. Jahrb. Syst. 23: 130. 1897. TYPE: NICARAGUA, Matagalpa, *Rothschuh 230* (not seen), not *Arrabidaea schumanniana* Huber.

Adenocalymma verrucosum Standl., Publ. Field Mus. Bot. Ser. 4:323. 1929. TYPE: HONDURAS, Atlantida, *Standley 54891* (A, F, US).

Arrabidaea belizensis Standl., Publ. Field Mus., Bot. Ser. 8: 48. 1930. TYPE: BELIZE, Middlesex, *Schipp 284* (BM, F, K, MO, NY, US).

Martinella verrucosa (Standl.) Standl., Contr. Arnold Arbor. 5: 138. 1933.

Scobinaria verrucosa (Standl.) Seib., Carnegie Inst. Washington Publ. 522: 408. 1940.

S. amethystina Dugand, Caldasia 7 (31): 24. 1955. TYPE: COLOMBIA, Bolivar, *Romero-Castaneda 1735* (COL).

This is the type species of *Scobinaria* which Sandwith (1968) merged with *Arrabidaea*, but which I have previously (1973a, 1973b) retained as generically distinct. *Scobinaria* has been separated from *Arrabidaea* by its echinate-verrucose capsule, large bilabiate calyx, uniformly 2-foliolate leaves, small axillary inflorescence, large stem diameter, orange-lenticellate bark, and large dorsally compressed corolla. I have now seen more species of this

alliance in the field and examined much additional material in the herbarium. Some species of *Arrabidaea* prove to have similar stems and bark [e.g. *A. corallina* (Jacq.) Sandw.], uniformly 2-foliolate (or simple) leaves [e.g. *A. monophylla* A. Gentry, *A. patellifera* (Schlecht.) Sandw.], reduced inflorescences [e.g. *A. oxycarpa* Urb., *A. triplinervia* (DC.) Baill. ex Bur., *A. craterophora* (DC.) Bur.], and bilabiate calyces [*A. bilabiata* (Sprague) Sandw.]. The fresh flowers of *A. triplinervia*, the species of *Arrabidaea* most like *Scobinaria*, are just those of *Scobinaria* except for less pronounced dorsal compression. Most important, the echinate-verrucose fruit which was originally considered diagnostic for *Scobinaria* turns out not to be constant, even within what has been regarded as a single species.

Relationships within *Arrabidaea* sect. *Macrocarpaea* (including *Scobinaria*) are difficult to define taxonomically. Two truncate-calyxed Brazilian species are readily separable but the several bilabiate and spathaceous-calyxed forms have been thought to represent a single, very polymorphic species. *Arrabidaea egensis* Bur. & K. Schum. of upper Amazonia is characterized by its hirsute leaves and branchlets; its fruits are unknown. Although it could be a mere pubescence variant, it is easily recognized and may be retained as provisionally distinct. *Arrabidaea oligantha* Bur. & K. Schum. of the Guianas and lower Amazonian Brazil has reduced inflorescences of one or two white flowers with strongly bilabiate calyces and slightly rough-surfaced fruits. Like *A. egensis*, it seems specifically distinct.

As interpreted by Sandwith, *Arrabidaea japurensis* (DC.) Bur. & K. Schum. ranges from Amazonian Brazil south to Bolivia and north through Central America. It is characterized by \pm racemose inflorescences of several magenta flowers with bilabiate to subspathaceous calyces and verrucose-prickly fruits. In Central America this plant has been generally known as *Scobinaria verrucosa* (Standl.) Seibert. A similar plant but with smooth-surfaced white-dotted viscid fruit has also been identified with *A. japurensis* by Sandwith; this viscid-fruited form occurs in Amazonia and the Guianas and apparently includes the types of both *A. japurensis* and *A. lenticellosa* Bur. & K. Schum. In treating both *A. oligantha* and *S. verrucosa* as synonyms of *Arrabidaea (Scobinaria) japurensis* (Gentry, 1973b), I had not seen the smooth-surfaced viscid fruit of typical *A. japurensis*.

Another species of this complex is *A. nicotianaeflora* Kränzl. which was considered distinct by Sandwith (in herb.) and which differs from its relatives in a more open, mostly terminal inflorescence and a 5-denticulate, noticeably 5-ribbed subtruncate or subspathaceous split calyx. Its fruit is unknown and I have previously treated it as a variant of the polymorphic *A. japurensis*. *Arrabidaea nicotianaeflora* is known from Amazonian Colombia [Klug 1694, Putumayo (MO)] and Matto Grosso, Brazil and is most closely allied with the central Amazonian smooth-fruited form with which it may yet prove synonymous.

Few South American fruiting collections of the *A. japurensis* complex are extant. All known fruits from the Andean countries are verrucose; all known fruits from central Amazonia [Llewelyn Williams 15712, Alto Casiquiare, Amazonas Territory, Venezuela (VEN)] and the Guianas [Lemee A-27, Maroni, Fr. Guiana (P); Gentry & Berry 14980, east of El Palmar, Delta Amacuro, Venezuela (MO, VEN)] are smooth and viscid. Both forms occur in Venezuela where the verrucose-fruited plant is restricted to the base of the Andes and the smooth-fruited plant to Amazonia and the Guianas. Contrary to Sandwith (1968) and to my own earlier opinion (Gentry 1973a, b), two species must be recognized in this complex: a smooth-fruited Amazonian one and a verrucose-fruited Andean and Central American one.

The Amazonian species is *A. japurensis*. The oldest epithet for the verrucose-fruited plant is *Paragonia schumanniana* Loes. (1897), but a combination in *Arrabidaea* based on that epithet is precluded by the existence of *A. schumanniana* Huber. The next oldest epithet is *Adenocalymma verrucosum* Standl. (1929) which was taken as basionym for the widely disseminated name *Socbinaria verrucosa* (Standl.) Seib. The new combination *Arrabidaea verrucosa* (Standl.) A. Gentry is necessary for the verrucose-fruited species. If *Scobinaria* were retained as generically distinct, a combination based on *Paragonia schumanniana* would be necessary.

Recognition of two species in the *A. japurensis* complex does not solve all the taxonomic problems. The form which occurs in the wet forest along the Caribbean slope of Central America has a non-echinate, only slightly verrucose fruit, very similar to that of the Guianan *A. oligantha*. Since intermediate degrees of fruit echination occur elsewhere in Central America, the extreme forms are probably also best regarded as intraspecific variants. Even though some fruits of *A. verrucosa* approach those of *A. oligantha*, the latter's reduced inflorescences, white flowers, and range disjunction seem adequate for specific separation.

In summary, the Central American and western South American species should be known as *A. verrucosa* (Standl.) A. Gentry. It is distinct from the Guianan and Amazonian *A. oligantha*, *A. japurensis*, *A. nicotianae flora* and *A. egenesis*.

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