

***Sertulum Ternstroemiacearum*, V. Taxonomy of the *Ternstroemia dentata* complex,
including one new species**

Sertulum Ternstroemiacearum, V. Taxonomía del complejo *Ternstroemia dentata*,
incluyendo una nueva especie

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ABSTRACT

Ternstroemia Mutis ex L.f. (Ternstroemiaceae) presents its greatest center of diversity in northern South America, where *T. dentata* (Aubl.) Sw., one of the most common species, occurs. As a result of a critical review of herbarium specimens of this and most related taxa, a new taxonomic concept (*T. ostracophylla* J.R. Grande, *sp. nov.*), is proposed. A complete description of the new entity and a table where it is compared with *T. dentata*, *T. laevigata* and *T. urophora* are provided. Illustrations, distribution maps, conservation status, and a discussion of the affinities and ecology of these four species are provided along with a key and a complete list of specimens. *Published online www.phytologia.org Phytologia 104(3): 27-39 (September 20, 2022). ISSN 030319430.*

KEY WORDS: Brazil, Colombia, Guayana Shield, South America, Taxonomic novelty, Ternstroemiaceae, Venezuela.

RESUMEN

Ternstroemia Mutis ex L.f. (Ternstroemiaceae) presenta su mayor centro de diversidad en el norte de Sudamérica, donde una de sus especies más comunes es *T. dentata* (Aubl.) Sw. Como resultado de la revisión crítica de muestras de herbario de este y los taxones más relacionados, se propone un nuevo concepto taxonómico (*T. ostracophylla* J.R. Grande, *sp. nov.*). Se proporciona una descripción completa de la nueva entidad y una tabla donde se compara con *T. dentata*, *T. laevigata* y *T. urophora*. Se proporcionan ilustraciones, mapas de distribución, estado de conservación y una discusión sobre las afinidades y la ecología de estas cuatro especies junto con una clave y una lista completa de especímenes.

PALABRAS CLAVE: Brasil, Colombia, Escudo Guayanés, Sudamérica, Novedad taxonómica, Ternstroemiaceae, Venezuela.

Ternstroemia Mutis ex L.f. (Ternstroemiaceae or Pentaphylacaceae s.l.) includes *ca.* 100-150 species from tropical America, continental tropical Africa, India, Sri Lanka, China, Southeast Asia, Australia, the Korean peninsula, and Japan (Kobuski 1942a, b, 1943; Barker 1980; Stevens 2001–onwards; Luna and Ochoterena 2004; Weitzman et al. 2004; Min and Bartholomew 2007; Cheek et al. 2017; Grande 2019; POWO 2022). One of them, *Ternstroemia gymnanthera* (Wight & Arn.) Bedd., is cultivated and has become naturalized in the U.S.A. (Christman 2008 [2015]; Serviss and Peck 2008). The genus is characterized by having a bushy or arboreal habit, glabrous (except in *Ternstroemia pubescens* Kobuski), alternate, and coriaceous or chartaceous leaves, with serrate, toothed or sub-entire margins, showing corky warts on the abaxial surface. Its flowers are axillary and solitary, with a quincuncial perianth, fleshy petals with membranous margins, more or less fused towards the base, and numerous stamens, subequal to dimorphic, arranged in one to several series. The anthers are bilocular and apiculate, with basal insertion, and the pistil differentiates into a superior ovary, 1–3 (–4–8) locular, with 1-numerous ovules per locule, a

styloid (consisting of a short style, entire or 2–3-divided, plus the prolonged apex of the ovary) and one to several stigmata, which may be punctiform, capitate (referred as “subpunctiform” in Rodríguez-Duque et al. 2021) or peltate. The fruits are cartilaginous, with circumscise or subvalvular dehiscence, and seeds are relatively large (usually greater than 4 mm long), covered by a fleshy testa that turns red or fuchsia when ripe (Metcalf and Chalk 1957; Weitzman et al. 2004; Grande 2018, 2019, 2020 [2021]).

Taxonomy of *Ternstroemia* has received increasing attention in recent years, with new species descriptions and regional revisions mainly from the Neotropics (e.g., Santamaría et al. 2014; Grande 2019; Vieira 2020) and Africa (Cheek et al. 2017, 2019). After a recent Ph.D. dissertation on Guayana Shield species (Grande 2019), probably the region with the highest diversity in the genus, several species complexes were proposed. One of them, widespread through northern South America, is formed by *Ternstroemia dentata*, *T. laevigata*, *T. urophora* and an additional undescribed species. In advance to the revision of the tribe Ternstroemieae, in progress since 2009 (<https://www.researchgate.net/project/Systematics-of-tribe-Ternstroemieae-worldwide>), the taxonomy and distribution of the *Ternstroemia dentata* complex is updated.

MATERIALS AND METHODS

Approximately 1000 collections (for a total of *ca.* 1500 dried specimens) from northern South America, including loans from herbaria B, F, G, MY, NY, U, and UOJ, visits to MER, MERC, MERF, MY, MYF, and VEN, photographic material available at Re flora-Virtual Herbarium (2022), the virtual herbaria of New York (NYBG-Steere Herbarium 2022), Paris (P Herbarium-Vascular Plants 2022), and Rio de Janeiro (JABOT 2022), plus photographic material from INPA, MA, PORT and UEC have been studied and identified. The type material was examined directly and/or through Jstor-Global Plants (2022). Samples were examined with a Leica MZ6 stereoscopic microscope, and the images of the specimens through measurement tools available in virtual sites or directly with the aid of a rule and comparing to the available scales. If there is more than one herbarium registration number, the most recent is chosen (for those with associated barcodes “bc” is added between herbarium acronym and herbarium registration number); for F, however, original registration number is maintained, since the number which is associated with a barcode is not visible in the specimens consulted. The term “*n.v.*” (*non visus*) is included for those duplicates that were not seen. Herbarium acronyms are cited according to Thiers (2022).

For the description of the new species, the criteria established by Grande (2018, 2019) are followed, including the differentiation of the different parts of the pistil, where the styloid corresponds to the styliform extension of the apex of the ovary (pseudostyle) plus the style itself. The interpretation of the glandular emergences of the foliar margins and of sepals as colleters, according to Thomas (1991). The inflorescences are solitary, although they are sometimes grouped into brachyblasts, and the axis includes a hypopodium (corresponding to the peduncle), a mesopodium and an epipodium, the latter two forming the pedicel and usually inconspicuous. The fruits are classified, according to the type of dehiscence, into subvalvular and circumscised. In some references, the subvalvular fruits are described as “indehiscent” or “irregularly dehiscent”, depending whether fruit opening is delayed or the valves cannot be clearly distinguished (*cf.*, Grande 2019; perhaps only *Ternstroemia washikiatii* really indehiscent —*cf.*, Cornejo and Ulloa 2016—). Leaves (more properly nomophylls) are usually of three types: those normally developed along main branchlets, those disposed in secondary minor branches (arising from the former), and reduced nomophylls (around floriferous sections of branchlets, alternating with hypsophylls). Only the normally developed nomophylls are included in the description. Colors are reported as found in dry material; for those structure with information on living material (according to herbarium labels), *in vivo* coloration is reported. Biogeographical areas follow the most recent system of Morrone (2017). The map (Fig. 3) was made with the aid of SimpleMapPR (Shorthouse 2010) and reflects coordinates as they appear in the herbarium labels (when expressed as a range plotted as an average), plus those that could be inferred with the aid of Google Earth (2022). The conservation status of the new species was determined according to the criteria of the

Red List of the International Union for Conservation of Nature (IUCN 2012), based on the information available in GeoCAT (Bachman et al. 2011) Google Earth and literature. Plant names and authors follows the International Plant Names Index (IPNI 2022).

RESULTS AND DISCUSSION

Ternstroemia dentata is a widespread species in northern South America. Three additional taxa, (*viz.*, *T. laevigata*, *T. urophora* and an undescribed species from upper Río Negro and upper Orinoco rivers) are closely similar and have been mixed or misidentified. All of them have coriaceous larger leaves, more or less urceolate corollas, punctiform stigmata, 2 or 4-locular ovaries (when bilocular with two ovules in each cell, if tetralocular just one), and fruits more or less globose, ovoid or conical, with a conspicuous rostrum (at least ½ the length of fruit body).

In the following paragraphs the new species is described, illustrated, and compared with most similar taxa. Further information on morphology, distribution, nomenclature and classification for the *Ternstroemia dentata* complex is available in Grande (2019, 2020 [2021]). A complete list of studied specimens is available in Appendix 1.

Ternstroemia ostracophylla J.R. Grande, *sp. nov.* **TYPE: BRAZIL. Amazonas:** mun. Barcelos, platô da Serra Aracá, serra N, 6 h O do campo de pouso, 00° 51' N, 63° 22' W, 1150 m, 20 II 1984. *do Amaral 1637* (Holotype: NY bc 1183331; isotype: RB bc 435987). Figs. 1, 2C, 3.

Arbuscula vel arbor parva *Ternstroemiam dentatam* aemulans, foliis percrassis, sepalis subaequalibus ac fructibus parvis tenuibusque (0.9–1 cm non 1,2–2 cm diam., pericarpio < 1 cm non 1–2.5 cm crasso) ab ea discrepat.

Shrub or small tree, 1–4 m tall, with erect or procumbent branches; **branchlets** (1–)2–5 per node. **Leaves** alternate or more or less grouped throughout branchlets (*i.e.*, pseudo-whorled); petioles 0.6–1.8 cm long; leaf blades 3.8–10 cm × 1.9–5.7 cm, adaxially brown, abaxially ochraceous, sometimes greenish (and then also darker on the upper side), thickly coriaceous, elliptic, obovate-elliptic or (seldom) narrowly elliptic; base cuneate; margin slightly revolute and subentire towards base, discretely and widely toothed towards apex; apex discretely acuminate, sometimes obtuse or rounded, seldom emarginate (in reduced leaves); midvein impressed on the adaxial face and keeled on the abaxial surface, secondary venation obscure. **Inflorescences** solitary, axillar, spaced along branchlets or, more frequently, grouped in floriferous sections, where they are subtended by hypsophylls or reduced nomophylls; peduncles 0.6–2.3 cm long; hypsophylls early caducous, not seen; bracteoles deltoid to ovate, subopposite, keeled, the lower 0.6–0.7 × 0.6–0.7 mm, upper ones *ca.* 1.1 × 0.6 mm. **Flowers** hanging at anthesis; flower buds pinkish (*in vivo*); calyx greenish with pinkish or reddish tints (*in vivo*); sepals erect or patent, widely ovate, pointed at apex; outer sepals 0.5–0.6 × 0.5 cm; inner sepals 0.5–0.7 × 0.5 mm; corolla urceolate, whitish (*in vivo*) *ca.* 0.8 cm long, forming a tube *ca.* 0.4 mm long; sepals lobes triangular-ovate, membranaceous along margins. Androecium containing *ca.* 40 stamens *ca.* 5 mm long; filaments linear, *ca.* 2.5 mm long, with (*in vivo*); anthers oblong, *ca.* 2.5 mm long, yellow (*in vivo*), flattened dorsiventrally and with a conspicuous apicule *ca.* 0.7 mm long. Pistil *ca.* 1 cm long, scarcely exceeding the corolla; ovary ovoid, 4-locular, with a single ovule per locule, greenish (*in vivo*); stigma punctiform, bilobate. **Fruit** globose or subconic, 1.1–1.2 × 0.9–1 cm, with the styloid concrescent, forming a rostrum of *ca.* 0.4 cm long, green when immature, yellow or orange at its maturation (including the persistent sepals and peduncle; *in vivo*); pericarp thin, <1 mm width. **Seeds** subreniform, laterally flattened, 6–7 × 4 mm, 4 per fruit, bearing a red sarcotesta (*in vivo*).

Additional material (paratypes): BRAZIL. Amazonas: Barcelos. Serra do Aracá, Acampamento do fosso, Parque Estadual da Serra do Aracá, 19 IV 2014. *Barbosa-Silva 263* (RB bc 873536); Barcelos. Serra do Aracá, trilha do acampamento do fosso para a cachoeira do Eldorado, passando pelo mirante, Parque

Estadual da Serra do Aracá, 20 IV 2014. *Barbosa-Silva* 282 (RB bc 873555); serra do Aracá, platô (ou encosta?), 200 km ao N de Barcelos, III 1984. *da Silva* 7170 (NY bc 1183447, NY bc 1279962); mun. Barcelos, platô da Serra Aracá, parte E da serra N, 00° 51' N, 63° 22' W, 1150–1250 m, 12 II 1994. *do Amaral* 1505 (NY bc 1183330); Barcelos. Parque Estadual da Serra do Aracá. Vegetação arbustiva com afloramentos e alagados, 29 IX 2011. *Forzza* 6556 (RB cb 715502); Barcelos. Parque Estadual da Serra do Aracá, 01 XI 2011. *Martinelli* 17284 (RB bc 686695); serra Aracá, 1000 m, 10 XII 1974. *Pires* 15038(59) (NY bc 1183393); plateau of N massif of serra Aracá, S side of N mountain, 00° 51–57' N, 63° 21–22' W, 1200 m, 12 II 1984. *Prance* 29006 (NY bc 1183385, RB bc 435937, U bc 283444); encosta da serra Aracá, 600 m, 31 I 1978. *Rosa* 2328 (NY bc 1183439); platô da serra Aracá, parte SE da serra N, 00° 51' N, 63° 22' O, 1150–1250 m, 24 II 1984. *Tavares* 138 (NY bc 1183454); Barcelos, Serra do Aracá, fase norte, topo da encosta, 00° 57' N, 63°, 23' 30" W, 25 VIII 2001. *Vicentini* 1833 (INPA 214358); Barcelos, Serra do Aracá, face norte, topo da encosta, 00° 57' N, 63° 23' 30" W, 25 VIII 2001. *Vicentini* 1838 (INPA 214363).

COLOMBIA. Guainía: Maimachi, serranía del Naquén, cerro Minas, alrededores del helipuerto-15 y camino hasta la cima del cerro, 01° 12' N, 68° 13' W, 900 m, 07 IV 1993. *Barbosa* 8330 (NY *s.n.*); mun. Maimachi, serranía de Naquén, cerca al helipuerto 15, 02° 13' N, 68° 14' W, 730 m, 30 VII 1992. *Cortés* 187 (NY *s.n.*), 188 (NY *s.n.*).

VENEZUELA. Amazonas: dpto. Atabapo, macizo del Marahuaca, gran altiplanicie ubicada en el piedemonte SO del sector meridional del cerro Marahuaca ("Atahua-Shiho"), 03° 40' N, 65° 32' W, 950–1000 m, 14 XII 1992. *Huber* 13466 (MYF 14329).

Etymology: the specific epithet makes reference to the hardness and general aspect of leaves (φύλλον), similar when dry to a fragment of old pottery (ᾠστρακον).

Habitat and distribution: *Ternstroemia ostracophylla* is found in the Guayana Shield, an ancient terrain of Precambrian origin encompassing eastern Colombia, southern Venezuela, northern Brazil and the Guianas (Guyana, Suriname and French Guiana). It has been collected in Brazil, Colombia and Venezuela, between 600 and 1250 m. It usually grows in shrublands on sandstone or white sand, less frequently in the nearby low forest (*Vicentini* 1833). *Ternstroemia dentata*, instead, usually thrives below 250 m, seldom reaching 400–500 m, 610 m in the Kanuku mountains, in savannas and transitional areas between forests and savannas, colonizing disturbed areas as *capoeiras* (burned, felled, or plowed places for subsistence agriculture) and roadsides. From a biogeographical point of view, species of the *Ternstroemia dentata* complex should be included in the Boreal Brazilian and South Brazilian dominia. The new species, like *Ternstroemia urophora*, is found in the Imeri province, in contrast to *T. laevigata*, which is confined to the Guayana province. *Ternstroemia dentata*, on the other hand, is distributed over a wider area, throughout the provinces of Guayana, Guayana Lowlands, Roraima, Madeira and Rondônia; although it does not overlap in its distribution area with those species, it becomes a neighbor of one of them (*viz.*, *T. laevigata*; *cf.*, Fig. 3). *Ternstroemia dentata* and *T. urophora* are more or less common species in lower Río Negro, but while *T. dentata* occupies the interfluvial space ("terra firme"), *T. urophora* is found on banks of black water rivers (*igapós*) and the nearby ecosystems on wet sand (*campinas*). Bittrich et al. (1993) cited *Ternstroemia laevigata* for that area, but after the revision of Grande (2019) it has been established that it has only been found in the upper basins of the Branco and Caroní rivers (Venezuela and Brazil). The populations from the vicinity of Manaus, cited by Bittrich et al. (1993) as of this species, correspond to *T. urophora* (Grande 2019, 2020 [2021]).

Conservation: according to the criteria of the IUCN Red List (IUCN, 2012) the new species is not endangered ("Least Concern" or LC). Extent of occurrence (89,008 km²) is large enough and localities where the species grows are either legally protected or well preserved. According to area of occupancy (16,000 km²) it could be Vulnerable (VU), but just point B1a matches. Low number of localities is probably an artifact since the area where the species grows is still poorly sampled.

Affinities: similar to *Ternstroemia dentata*, with which it shares broad and coarsely toothed leaves. That species, however, tends to have obovate blades, conspicuous teeth relatively distant from each other,

faint (but obvious) secondary venation, inner sepals with truncate to rounded apex, clearly lighter than the outer ones, and yellowish-ochraceous with a spot or macule along midvein, which is notably developed towards the base (Grande 2019). *Ternstroemia laevigata* and *T. urophora* are the other two most similar species. Both of them, however, have more or less concolorous leaves with sub-entire margins. *Ternstroemia urophora* may also be differentiated by the subequal or gradually larger (from outside to inside) sepals and *T. laevigata* by the unequal sepals and reddish coloration (for additional differences between these four species, see Table 1). Grande 2020 [2021] erroneously cites the sepals of *Ternstroemia laevigata* as subequal, but they are, actually, of two different types (as in *T. dentata*). *Ternstroemia caput-medusae* and *T. rupestris* seems to be also related, but they can be readily distinguished by the complex inflorescences (cf., Grande 2020 [2021]). Some specimens of *T. urophora* (especially *Nelson P21090*; Appendix 1) show very dense floriferous areas on branchlets, but further development apparently elongates internodes and produces additional normally developed nomophylls.

Ternstroemia ostracophylla was not considered by Boom (1989), who describes three new species from Serra do Aracá and its surroundings (where the species has been more often collected). Thence, several collections have been determined either as *T. dentata* (usually *incertae sedis*) or *T. sp. indet.* Previously available identifications include “*Ternstroemia dentata*” (det. B.M. Boom in *Prance 29006* [U!], 1989), “*Ternstroemia cf. dentata*” (anonymous det. in *do Amaral 1505* [NY!]), “*Ternstroemia aff. dentata*” (det. M. Córdoba and R. Cortés in *Cortés 187* [NY!] and *188* [NY!]) and “*Ternstroemia sp. nov.?*” (det. J.R. Grande in *Huber 13466* [MYF!]). More recently, it has been determined in RB (!) as “*Ternstroemia tepuiensis*” (*Martinelli 17284, Prance 29006, do Amaral 1637, Forzza 6556, Barbosa-Silva 263 and 282*, det. G.S. Barbosa-Silva). The last species, however, is notably different and is related, instead, to *Ternstroemia carnososa* Cambess., *T. circumscissilis* Kobuski, *T. crassifolia* Benth., *T. discoidea* Gleason, *T. distyla* Kobuski, and *T. unilocularis* Kobuski & Steyerl., whose fruits are circumcisedly dehiscent (cf. Grande, 2018, 2019, 2020 [2021]).

Key to the species of the *Ternstroemia dentata* complex

- 1a. Inner sepals conspicuously larger and/or wider than outers, discolorous, apically rounded 2
 1b. Sepals subequal or gradually becoming smaller from outside to inside, concolorous; apex of inner sepals pointed 3
- 2a. Leaf blades conspicuously toothed, obovate, elliptic-obovate or obovate-lanceolate, acuminate or rounded at apex (seldom retuse), usually ochraceous; inner sepals ochraceous to yellowish towards margins and brownish towards base and along midvein *T. dentata* (Aubl.) Sw.
 2b. Leaf blades subentire, elliptic to elliptic-obovate, apically obtuse, rounded or, seldom, subacute, ochraceous or reddish-ochraceous; inner sepals reddish-ochraceous towards margins and reddish-brown towards center and along midvein..... *T. laevigata* Wawra
- 3a. Leaf blades subentire or coarsely and inconspicuously serrate-dentate, coriaceous, generally ochraceous, brownish to dark brown when dry, concolorous, with secondary venation (usually) forming an angle of 45°–60° to midvein, conspicuous or not *T. urophora* Kobuski
 3b. Leaf blades conspicuously and widely toothed, thickly coriaceous, usually brownish in the upper side and ochraceous abaxially, sometimes greenish (and then –also– conspicuously darker by the upper side); secondary venation forming an angle of *ca.* 45° to midvein *T. ostracophylla* J.R. Grande

Table 1. Comparative morphology of the species from the *Ternstroemia dentata* complex (*T. dentata* (Aubl.) Sw., *T. laevigata* Wawra, *T. ostracophylla* J.R. Grande and *T. urophora* Kobuski).

	<i>T. dentata</i>	<i>T. laevigata</i>	<i>T. ostracophylla</i>	<i>T. urophora</i>
Number of branchlets per node	1–2(3–5)	1–3	(1–)2–5	1–2(3–4)
Petiole length	1–2 cm	0.9–1.8 cm	0.6–1.8 cm	(0.4–1)1.3–2.5 cm
Leaf blade texture	coriaceous	coriaceous	thickly coriaceous	coriaceous
Leaf blade shape	obovate, obovate-elliptic or obovate-lanceolate	obovate or obovate-elliptic	elliptic, obovate-elliptic or (seldom) narrowly elliptic	elliptic or obovate-elliptic
Leaf blade margin	coarsely and remotely toothed (seldom subentire)	subentire	slightly revolute and subentire towards base, discretely and remotely toothed towards apex	subentire to finely and discretely toothed
Leaf blade apex	acuminate, rounded or, seldom, retuse	rounded to discretely acuminate	discretely acuminate, sometimes obtuse or rounded, seldom emarginate (in reduced leaves)	acuminate to caudate
Secondary venation (to midvein)	ca. 45°	ca. 45°	ca. 45°	45°–60°
Leaf blade coloration (<i>in sicco</i>)	ochraceous to reddish-ochraceous, seldom greenish	reddish-ochraceous, seldom greenish	adaxially brown, abaxially ochraceous, sometimes greenish (and then also darker adaxially)	ochraceous, brown or dark brown, seldom slightly purple (especially in lower side) or adaxially greenish
Peduncle length	0.7–1.2 cm	ca. 2 cm	(0.1–)0.6–2.3 cm	(0.1–)0.6–1.7
Sepals	dimorphic, inner sepals noticeably larger, discoloured; the apex rounded	dimorphic, inner sepals noticeably larger, discoloured; the apex rounded	subequal, gradually smaller from outside to inside, concolorous; the apex pointed	subequal, gradually smaller from outside to inside, concolorous; the apex pointed
Sepal apex	rounded	rounded	pointed	pointed
Outer sepal length	5–6 mm	ca. 6 mm	(4.5–)5–6 mm	ca. 5 mm
Outer sepal coloration (<i>in sicco</i>)	Brown	reddish-brown	ochraceous	reddish-ochraceous to dark brown
Inner sepal length	7–9 mm	8–9 mm	5–7 cm	5–7 cm
Inner sepal coloration (<i>in sicco</i>)	ochraceous to yellowish, with a central brown spot	reddish-ochraceous, with a central reddish-brown spot	ochraceous	reddish-ochraceous to dark brown
Corolla tube relative length	1/2	1/2	1/2	1/3
Fruit shape	globose, ovoid or subconic	ellipsoid to ovoid	globose or subconic	globose, ovoid or conic
Fruit size (excluding rostrum)	1.4–1.7 × 1.2–2 cm	ca. 1.6 × 1.4 cm	1.1–1.2 × 0.9–1 cm	1.4–3 × 1.3–2.3 cm
Pericarp thickness	1–2.5 mm	ca. 1 mm	< 1 mm	< 1 mm

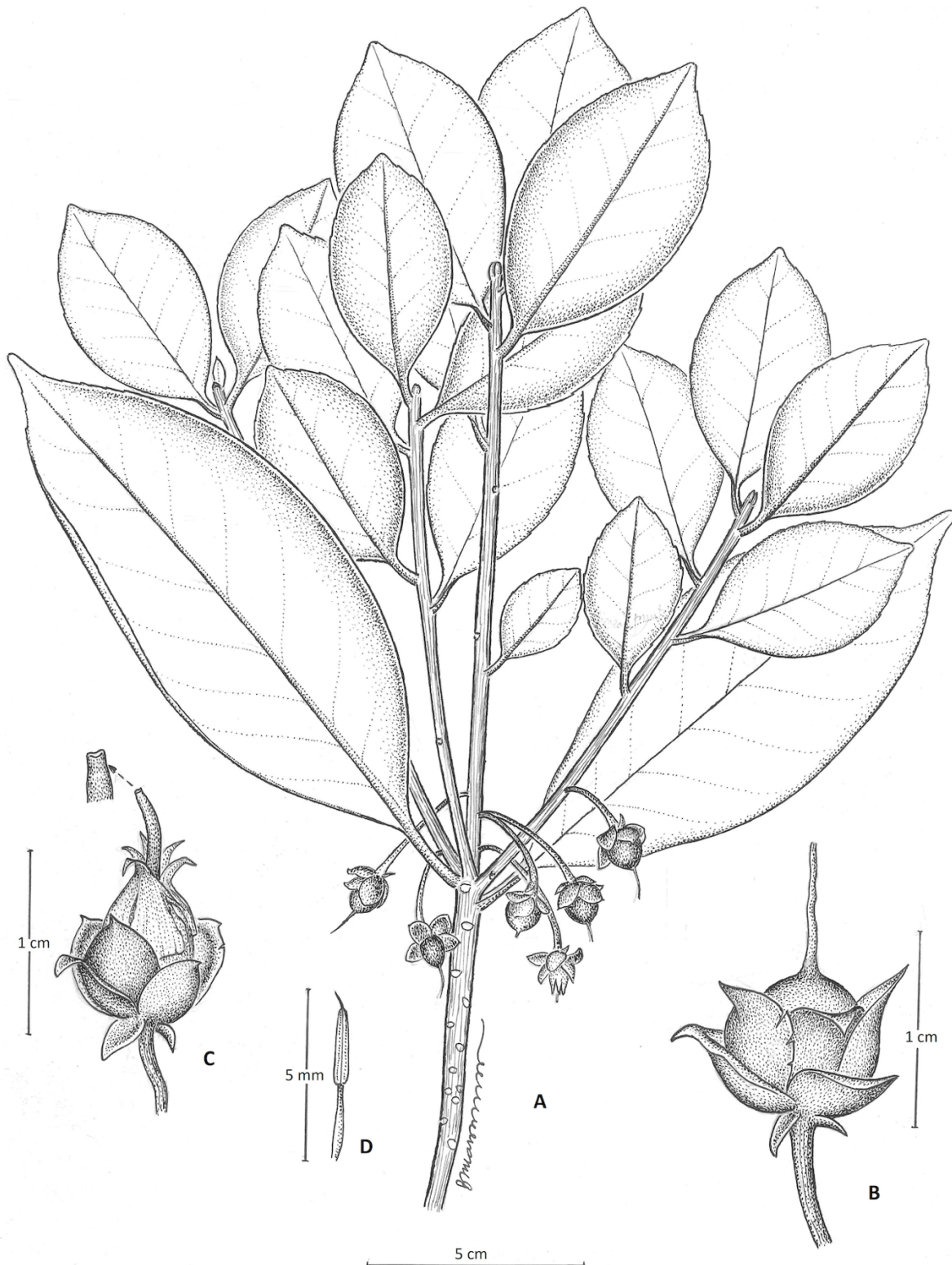


Figure 1. Line-drawing of *Ternstroemia ostracophylla* J.R. Grande, *sp. nov.* A. Habit, showing a flower, immature and submature fruits. B. Submature fruit. C. Immature fruit, with corolla still attached; detail of stigma (magnified). D. Stamen. A–B from holotype (*do Amaral 1637* [NY bc 1183331]); B–D from *Prance 29006* (U bc 283444).



Figure 2. Species from the *Ternstroemia dentata* complex: A. *T. dentata* (Aubl.) Sw. (Maguire 24685 [NY 927187]). B. *T. laevigata* Wawra (Maguire 40280 [NY 1183469]). C. *T. ostracophylla* J.R. Grande, sp. nov. (Prance 29006 [NY 1183385]). D. *T. urophora* Kobuski (Prance 18055 [NY 1183381]).

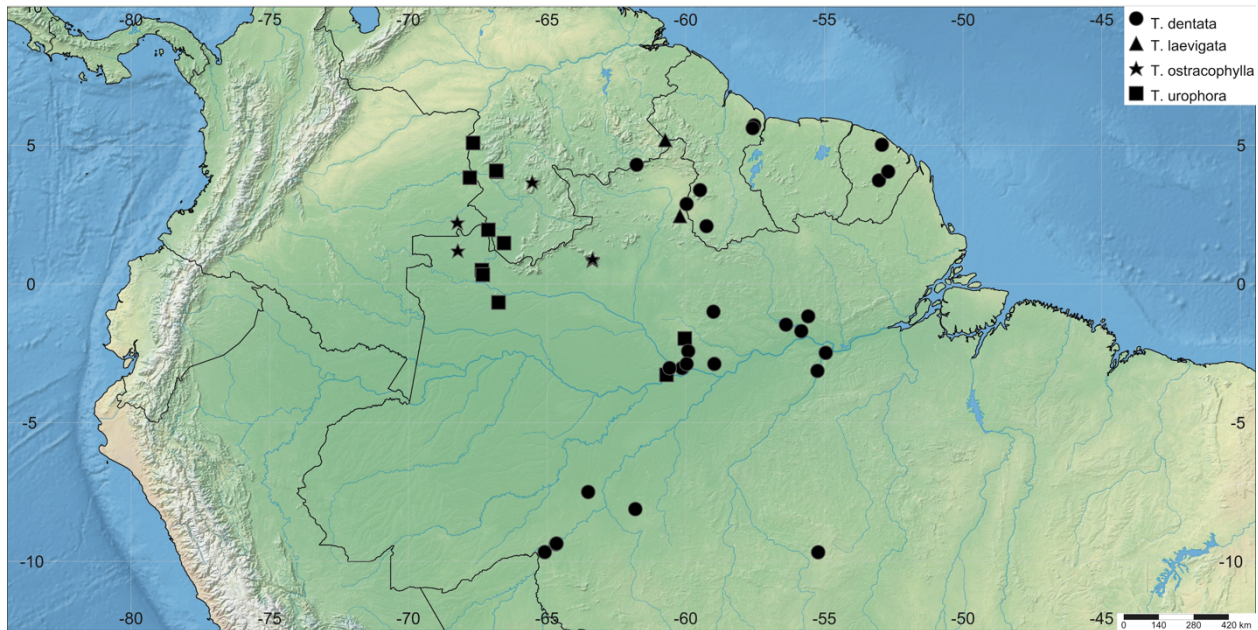


Figure 3. Distribution map of *Ternstroemia dentata* (Aubl.) Sw., *Ternstroemia laevigata* Wawra, *T. ostracophylla* J.R. Grande, *sp. nov.*, and *T. urophora* Kobuski.

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Appendix 1. Voucher specimens included in map (excluding those of *Ternstroemia ostracophylla* J.R. Grande, *sp. nov.*, which are cited in text).

Ternstroemia dentata (Aubl.) Sw., Prodr. [O. P. Swartz] 81. 1788, *non* Spreng. ex DC., *nom. illeg.*, Mém. Soc. Phys. Genève 1: 411. 1821. *Taonabo dentata* Aubl., Hist. Pl. Guiane 1: 569, 4: tab. 227. 1775. *Ternstroemia dentata* var. *typica* Wawra, Fl. Bras. (Martius) 12(1): 279. 1886, *nom. inval.* *Mokof dentata* (Aubl.) Kuntze, Revis. Gen. Pl. 1: 63. 1891, *sub* Mokofua dentata (Aubl.) Kuntze. **LECTOTYPE (designated by Vieira et al. 2021): [FRENCH GUIANA]:** Habitat in sylvis supra montem Serpent dictum, “Guyane”, *s.d.*, *Aublet s.n.* (BM bc 41973; isolecotype: S bc 1115324).

Ternstroemia dentata var. *α. multiflora* Choisy, Mem. Soc. Phys. Hist. Nat. Genève 14: 106. 1855. *Ternstroemia multiflora* Spruce ex Choisy, *ibid.*, *nom. nud.* LECTOTYPE (designated by Grande 2020 [2021]): BRAZIL. Pará: in vicinibus Santarem, 09/1850, *Spruce s.n.* (F 686545; isolecotype: BM bc 41938, E bc 296781, FI bc 6035, G bc 366238, G bc 366274, GH bc 306606, K bc 687881, NY bc 1239903, NY bc 1239904, P bc 780884).

Ternstroemia dentata var. *γ. oblongifolia* Choisy, Mem. Soc. Phys. Hist. Nat. Genève 14: 106. 1855. *Ternstroemia dentata* var. *α. opaca* Wawra, Fl. Bras. (Martius) 12(1): 279. 1886. LECTOTYPE (designated by Vieira et al. 2021): BRAZIL. Amazonas: in sylvis primaevis ad Ega [presently Tefé], 1831, *Poeppig 2667* (F 875286; isolecotype: F 686248, G bc 366278, HAL bc 77007, NY bc 1239923).

Ternstroemia dentata var. *β. latifolia* Wawra, Fl. Bras. (Martius) 12(1): 279. 1886. LECTOTYPE (designated by Grande 2020 [2021]): BRAZIL. Amazonas: in vicinibus Barra, *Spruce 1045* (NY bc 127665; isolecotype: M bc 165337).

Ternstroemia megaphylla J.A. Vieira & D. Sampaio, Neodiversity 14: 8, figs. 2–3. TYPE: BRAZIL. Amapá: mun. Macapá, 7 km NW of Riozinho on highway Perimetral Norte (BR210), ca. 01°21' N, 53°15' O, 31 XII 1984, *Rabelo 3120* (holotype: NY bc 1183432; isotype: HAMAB *n.v.*, US 3433327 *n.v.*).

Additional material: BOLIVIA. La Paz: prov. Iturralde, Luisita, O del río Beni, zona inundada del río Muqui, 13° 05' S, 67° 15' W, 180 m, 1 III 1984, *Beck 10149* (NY *s.n.*). **BRAZIL. Amapá:** estrada até Matapi, atrás Porto Grande, 17 X 1979, *Austin 7068* (NY bc 1183315, UEC 21137); mun. Macapá, 7 km NW of Riozinho on highway Perimetral Norte (BR210), ca. 01° 21' N, 53° 15' W, 31 XII 1984, *Rabelo 3120* (NY cb 1183432); 02 IV 1982, *Rosa 4126* (NY bc 1183438). **Amazonas:** Reserva Florestal Ducke, Manaus-Itacoatira, km 26, 02° 53' N, 59° 58' W, 10 VIII 1995, Assunção 213 (UEC 11311, VEN 298791); estrada Manaus-Itacoatiara km 9, 2 III 1956, *Coelho s.n.* (NY *s.n.*); mun. Tefé, rio Solimões, margem direita, lago Tefé, Vila Nogueira, 12 X 1982, *do Amaral 23* (NY bc 1183327); Manáos, estrada do Paredão, 8 IV 1943, *Ducke 1216* (NY bc 1183324); Tarumã Grande, 1 km N from the junction of rio Negro and igarape Tarumã, 03° 02' S, 60° 08' W, 23 XI 1977, *Keel 307* (NY *s.n.*, NY bc 1183414); basin of rio Madeira, Mun. Humayta, *pr.* Livramento, on rio Livramento, 12 X–6 XI 1934, *Krukoff 6779* (B bc 10 0423788, G bc 374638, G bc 374638, NY *s.n.*, U bc 283440); basin of rio Madeira, mun. Humayta, on plateau between rio Livramento and rio Ipixuna, 7–18 XI 1934, *Krukoff 7087* (B bc 10 0423789, G bc 374585, G bc 374585, NY *s.n.*, U bc 283441); basin of rio Madeira, mun. Humayta, on plateau between rio Livramento and rio Ipixuna, 7–18 XI 1934, *Krukoff 7287* (NY *s.n.*); mun. Manaus, along road to Aleixo, 12 VIII–1 IX 1936, *Krukoff 8036* (G bc 374589, NY *s.n.*); rio Negro, margem direita, 50 km acima de Manaus,

Campo Amélia (fazenda Belo Horizonte), 03° 02' S, 60° 35' W, 18–19 VIII 1985, *Nelson 1422* (MYF 12365, NY bc 1183422); dtto. Agropecuário, fazenda Porto Alegre, Reserva 3402 (Cabo Frio) of the WWF/INPA MCS project, 02° 25' 25" S, 59° 54' 38" W, 50–150 m, 21 I 1989, *Pacheco 121* (NY *s.n.*, U bc 283443); estrada da Reserva Florestal Ducke, capoeira aberta de terra firme, solo arenoso, 19 III 1958, *Pessoal do C.P.F. s.n.* (NY bc 1183427); Ega (=Tefê), 1832, *Poeppig 2667* (NY bc 1239923); km 8, colonia Santa Antonio, 08 IX 1966, *Prance 2221* (G bc 374639, G bc 374639, NY *s.n.*, U bc 283442); Campo Amélia (fazenda Belo Horizonte), entre igarapé Acajatuba e margem direito do rio Negro, 03° 02' S, 60° 35' W, 21 IV 1986, *Prance 30041* (MYF 12595, NY bc 1183375); Manaus, SW corner of Ducke Forest Reserve, 14 km of INPA by road via Bairro de São José, 17 IX 1987, *Pruski 3272* (NY bc 1183431, VEN 401835); Reserva Florestal Ducke, Manaus-Itacoatiara, km 26, área do Projeto Copaiba, 02° 53' S, 59° 58' W, 26 IV 1988, *Ramos 1866* (U bc 61873); estrada Manaus-Itacoatiara, km 28, 22 XI 1960, *Rodrigues 1922* (NY bc 1183402); estrada Manaus-Boa Vista, km 10, 24 X 1961, *Rodrigues 2099* (NY bc 1183403); igarapé do Matrinchão, 12 IV 1961, *Rodrigues 2350* (NY bc 1183404); Manaus, igarapé do Buião, 24 IV 1963, *Rodrigues 5053* (NY bc 1183407); mun. São Gabriel da Cachoeira, alto rio Negro, próximo à boca do igarapé Tuari; lago Amaro, do lado oposto à ilha de Aparecida, 00° 20' N, 67° 19' W, 06 XI 1987, *Rodrigues 10867* (NY bc 1183413); rio Jarí, monte Dourado, planalto A, 04 X 1968, *Silva 1107* (NY bc 1183450); Reserva Florestal Ducke, Manaus-Itacoatiara, km 26, próximo a entrada da reserva, 02° 53' S, 59° 58' W, 13 II 1995, *Sothers 325* (G bc 374637, UEC 111444); Reserva Florestal Ducke, Manaus-Itacoatiara, km 26, estrada de acesso ao alojamento, 02° 53' S, 58° 58' W, 13 XII 1995, *Sothers 710* (VEN 354226); *pr.* Barra, prov. Rio Negro, XII–III 1850–1, *Spruce 1045* (NY bc 127665, [NY 19553 (photo ex M)], [G bc 374588], [G bc 374719], [G bc 374720]); *pr.* Barra, prov. Rio Negro, V 1851, *Spruce 1302* (NY bc 1183542); INPA, estrada do Aleixo, km 3, Manaus, near tracking station; 26 XII 1973, *Steward P 20130* (NY *s.n.*); [prov.] Rio Negro, Manáos, VII 1900, *Ule 5166* (G bc 374590); Reserva Florestal Ducke, Manaus-Itacoatiara, km 26, Igarapé do Acará, na trilha da divisa, 02° 53' S, 59° 58' W, 23 V 1995, *Vicentini 965* (G bc 374591, U bc 20610); rodovia do Estanho, margem da rodovia a 12 km de Humaitá, 08° 07' S, 61° 49' W, 25 II 1979, *Vieira 164* (NY bc 1183457); road Humaitá to Lábrea, 63 km W of Humaitá, 07° 30' S, 63° 31' W, 30 IX 1979, *Zarucchi 2607* (NY bc 1183460). Mato Grosso: mun. Novo Mundo, Parque Estadual Cristalino, serra de Rochedo, acesso pela fazenda AJJ, 09° 40' 23" S, 55° 13' 40,71" W, 19 VIII 2008, *Sasaki 2244* (NY bc 1146409). **Pará:** mun. Oriximiná, rio Trombetas, margem direita ao N da mineração Sta. Patricia, 11 VII 1980, *Cid Ferreira 1458* (NY bc 1280882, NY bc 1183357); mun. Oriximiná, estrada Oriximiná-Óbidos km 12, margem esquerda, 14 IX 1980, *Cid Ferreira 2494* (NY bc 1183352); mun. Oriximiná, área da mineração Rio Norte, 5 km da vila residencial, 01° 28' S, 56° 23' W, 11 XI 1987, *Cid Ferreira 9558* (NY bc 1183349); mun. Óbidos, 91 km de Oriximiná nos campos de Ariramba, entre rio Jaramacaru e igarapé Mutum, 01° 10' S, 55° 35' W, 4 XII 1987, *Cid Ferreira 9751* (NY bc 1183350); mun. Óbidos, campos do Ariramba no lugar Tabuleta, 18 km do rio Jaramacaru, 01° 10' S, 55° 35' W, 6 XII 1987, *Cid Ferreira 9794* (NY *s.n.*); mun. Oriximiná, 10 km de Oriximiná na estrada p/ Óbidos (PA-28), 01° 42' S, 55° 50' W, 10 XII 1987, *Cid Ferreira 9826* (NY bc 1183347); mun. Oriximiná, 10 km de Oriximiná na estrada p/ Óbidos (PA-28), 01° 42' S, 55° 50' W, 10 XII 1987, *Cid Ferreira 9828* (NY bc 1183346); mun. Óbidos, campos de Ariramba, campos entre o igarapé do Mutum e rio Ariramba, 4 XII 1987, *Farney 2067* (NY *s.n.*); Marabá, Carajás, serra norte, estrada do N-1, 29 km do acampamento, 7 VIII 1982, *Maciel 790* (NY bc 1183416); mun. Almeirim, monte Dourado, estrada do Parú, próximo à entrada da torre 8, 17 X 1985, *Pires 665* (NY *s.n.*); Almeirim, mount Dourado, área da Agua Azul, próximo à gleba Angelim da Reserva Genética, 17 IX 1986, *Pires 1379* (NY bc 1183430, NY bc 1279957); BR 163, Cuiabá-Santarem highway; northern foothills of serra do Cachimbo, 11 XI 1977, *Prance 25195* (NY bc 1183368); mun. Santarém, península em frente a Alter do Chão, 02° 29' S, 54° 57' W, 22 IV 1989, *Sanaiotti 18* (NY bc 1183442); *pr.* Santarém, prov. Pará, IX 1850, *Spruce 1083* (NY bc 1239904, [NY bc 1239903], [NY 21486 (photo ex C)]); Santarém, subida da serra Piroca, 15 XII 1978, *Vilhena 330* (NY *s.n.*). **Rondônia:** km 5 da rodovia Vilhena-Porto Velho, 03 I 1979, *Silva 4111* (NY *s.n.*); chapada dos Parecis, a 29 km de Vilhena, 12° 45' S, 60° 10' W, 28 X 1979, *Vieira 739* (NY bc 1183458); rodovia RO-399, a 13 km de Vilhena, km 20, base da chapada dos Parecis, 12° 45' S, 60° 10' W, 03 XI 1979, *Vieira 887* (NY bc 1183456). **FRENCH GUIANA:** pic Matécho, versant S, 03° 44' N, 53° 02' W, 450 m, 19 IX 2000, *de Granville 14281* (NY *s.n.*, U bc 64758); ¿Camopi?, Haut Oyapock, sommet O du mont St. Marcel, 450 m, 26 VII 1975, *de Granville 2566* (B bc 10 0423800, NY *s.n.*, U bc 283397); montagnes des Nouragues, bassin de l'Approuague, Arataye, 04° 03' N, 52° 42' W, 410 m, X 1989, *Larpin 668* (U bc 245881); Réserve des Nouragues, Station de Recherches, inselberg, 04° 03' N, 52° 42' W, 410 m, 7 III 2004, *Poncy 1820* (U bc 228201); Crique Plomb, 05° 01' N, 52° 55' 40" W, 110 m, 23 X 2002, *Prévost 4654* (B bc 10 0141863); route Charvein Acarounay, km 6600, 20 I 1955, *Sabatier 4785* (B bc 10 0141865, NY bc 927186); Acarouany, 1856, *Sagot 60* (U bc 283456); montagnes des Nouragues, bassin de l'Arataye, sommet, 04° 03' N, 52° 42' W, 18 II 1988, *Sarthou 212* (NY *s.n.*). **GUYANA:** Wabuwak, Kanuku mountains, 609.6 m, XI 1948, ¿*Fanshawe?* (*Forest Department of British Guiana*) *WB 424/5821* (NY bc 927185); Wabuwak, Kanuku mountains, 609.6 m, XI 1948, *Fanshawe?* (*Forest Department of British Guiana*) *WB 474/5883* (NY bc 927184); Rupununi savanna, Mora savanna, *pr.* Toroebaroe creek, 03° 23' N, 59° 29' W, 145 m, 19 XI 1987, *Jansen-Jacobs 1037* (B bc 10 0423796, NY bc 927188, U bc 223342); Gunn's, Essequibo river, 240–260 m, 3 IX 1989, *Jansen-Jacobs 1430* (B bc 10 0423790, NY bc 927189, U bc 223341); Rupununi Kuyuwini landing, Kuyuwini river, 02° 05' N, 59° 15' W, 150–250 m, 28 IX 1992, *Jansen-Jacobs 3139* (NY bc 927182); East Berbice-Corentyne, S Awara savanna, 56.33 km S of Torani canal, on Canje river, 4.83 km SE of Digitima creek, 05° 43' N, 57° 32' W, 1–25 m, 18 XII 1986, *Pipoly 9340* (NY *s.n.*); East Berbice-Corentyne, W bank of Canje river, Cow savanna, *ca.* 1 km N of Digitima creek, 05° 37' N, 57° 35' W, 0–20 m, 14 IV 1987, *Pipoly 11564* (NY *s.n.*, [VEN] *s.n.*); East Berbice-Corentyne, W bank of Canje river, Cow savanna, *ca.* 1 km N of Digitima creek, 1–20 m, 14 IV 1987, *Pipoly 11566* (NY *s.n.*); East Berbice-Corentyne, W bank of Canje river, Cow savanna, *ca.* 1 km N of Digitima creek, 05° 37' N, 57° 35' W, 0–20, 14 IV 1987, *Pipoly 11571* (NY *s.n.*, [VEN] *s.n.*); East Berbice-Corentyne, W bank of Canje river, Cow savanna, *ca.* 1 km N of Digitima creek, 1–20 m, 14 IV 1987, *Pipoly 11581* (NY *s.n.*, [VEN] *s.n.*). **SURINAM:** Sectie O, 28 I 1906, *Gongrijp 64* (U bc 2834--, U bc 283458); *pr.* Jodensavanne (fluv. Suriname), 24 V 1957, *Heyligers 500* (U bc 283453); *pr.* Jodensavanne (fluv. Suriname), 30 X 1956, *Heyligers 503* (U bc 283454); *pr.* Jodensavanne (fluv. Suriname), 17 XII 1956, *Heyligers 529* (U bc 283445); *pr.* Jodensavanne (fluv.

Suriname), 18 I 1957, *Heyligers 570* (U bc 283446); *pr.* Jodensavanne (fluv. Suriname), 30 I 1957, *Heyligers 594* (U bc 283447); *pr.* Jodensavanne (fluv. Suriname), 17 VI 1957, *Heyligers 826* (U bc 283449); *pr.* Jodensavanne (fluv. Suriname), 18 VI 1957, *Heyligers 828* (U bc 283450); Saramacca, Kappel savanna, prope pedem australem montis Tafelberg, 300 m, 20 II 1961, *Kramer 3295* (U bc 283451); Tafelberg ("Table Mountain"), 485 m, 10 IX 1944, *Maguire 24685* (NY bc 927187); Tafelberg ("Table Mountain"), 485 m, 10 IX 1944, *Maguire 24685* (U bc 223343, VEN 39289); Sipaliwini savanna area on brazilian frontier, "4-Gebroeders" mountains, 450 m, 18 X 1968, *Oldenburger 307* (U bc 283452); Sipaliwini savanna area on brazilian frontier, "camp-forest" on W slope of "4-Gebroeders" mountains, 365 m, 30 XI 1968, *Oldenburger 587* (NY *s.n.*, U bc 223340); Zanderij I, X 1944, *Stahel 240* (B bc 10 0423791, NY *s.n.*, U bc 223295); achter Zanderij I, 02 III 1959, *van Donselaar 467* (U bc 283459); Coesewijne-savanna, opname 282, 16 III 1959, *van Donselaar 655* (U bc 283460); dtto. Brokopondo, 8 km ESE of village Brownsweg, afterwards lake, 16 X 1964, *van Donselaar 1690* (U bc 283461); Brinckhill (Saban Pasi) Nature Reserve, 17 X 1967, *Wildschut 11832* (NY *s.n.*); Nature Reserve Brinckheuvel, Saban Pasi savanne, 17 X 1967, *Wildschut 11832* (U bc 223294). **VENEZUELA: Bolívar:** dtto. Piar, Zapata, a 10 km al SO de Icabarú, 500 m, 12 II 1986, *Susach 1105* (NY *s.n.*, PORT 18748).

Ternstroemia laevigata Wawra, Fl. Bras. (Martius) 12(1): 281, tab. 55. 1886. *Mokof laevigata* (Wawra) Kuntze, Revis. Gen. Pl. 1: 63. 1891. **LECTOTYPE (designated by Grande 2020 [2021]): VENEZUELA:** Roraima, R.H. Schomburgk 573 (K bc 697496; isolectotypes: BM bc 41988, BM bc 41989, F 869787, F 686522, G bc 366231, G bc 366277, NY bc 127655, P bc 780876, P bc 780877).

Additional material: BRAZIL: Roraima: 8.05 km E of serra Sabana, 720 m, 16–18 XII 1954, *Maguire 40280* (NY bc 1183469); summit of serra da Lua, 02° 25–29' N, 60° 11–14' W, 1400 m, 24 I 1969, *Prance 9440* (NY bc 1183365). **VENEZUELA:** Roraima, *Schomburgk 573* (F 686522, F 869787, G bc 366231, K bc 697496, NY bc 127655).

Ternstroemia urophora Kobuski, J. Arnold Arbor. 32(2): 153. 1951. **TYPE: BRAZIL. Amazonas:** Manáus, Rio Tarumá-mirim, matinha marginal d'una campina arenosa, 17 VII 1943, *Ducke 1288* (holotype: A bc 306658; fragment: A 25053; isotypes: NY bc 1239901, US bc 409624).

Additional material: BRAZIL. Amazonas: along Rio Marié, at Marauná, 00° 40' S, 66° 45' W, 06 VI 1979, Alencar 470 (NY bc 1183314); Manaus-Caracarai road, km 140, 27 IX 1973, *Berg P18171* (NY *s.n.*, NY bc 1183318); Manaus-Caracarai road, *pr.* km 130, 13 XI 1973, *Berg P19546* (NY bc 1183317); mun. São Gabriel da Cachoeira, upper rio Negro, rio Cubate, tributary of rio Içana, 30 min. by motorboat *sup.* mouth, 03 XI 1987, *Daly 5563* (NY bc 1183319); *pr.* Manaus, igapó of Tarumá-mirim, *ca.* 20 min. per motorboat *sup.* rio Negro, 28 VIII 1991, *do Amaral 91/92* (NY bc 1183328); mun. Novo Japurá, rio Japurá, margem direita, lago do Mapari, 11 XI 1982, *do Amaral 433* (NY bc 1183329); Manáos, rio Tarumá-miry, 04 VII 1941, *Ducke 1212* (NY bc 1183325); mun. Presidente Figueiredo, "Campina das Pedras", ubicada en el km 115 de la rodovia BR-174 (Manaus-Caracarai), en el lado oriental del igarapé das Lajes, 01° 58' S, 60° 02' W, 100 m, 29–30 VI 1985, *Huber 10683* (NY bc 1183360); boca do rio Içana, local chamado Boa Vista (antigo Grilo), 00° 30' N, 67° 21' W, 12 XI 1987, *Kawasaki 118* (NY *s.n.*); basin of rio Solimoes, Tonantins, 03 VIII 1941, *Krukoff 12173/84* (NY bc 1183335); rio Negro, at Porto Camanaus, 19 X 1978, *Madison 6486* (NY bc 1183417); Manaus-Caracarai road, km 130, igarapé Lages, 10 V 1974, *Nelson P21090* (NY bc 1183423); rio Cuieiras, 50 km upstream, 1 IV 1974, *Ongley P21776* (NY bc 1183425); 2 km from rio Cuieiras at 2 km *inf.* mouth of rio Brancinho, 14 IX 1973, *Prance 17906* (NY bc 1183370, U bc 283510); rio Cuieiras, *pr.* Jarada, 17 IX 1973, *Prance 18055* (NY bc 1183381); Manaus-Caracarai road, km 130, igarapé Lages, 20 VI 1974, *Prance 21144* (NY bc 1183380); Manaus-Caracarai road, km 130, igarapé Lages, 20 VI 1974, *Prance 21144* (NY bc 1183380); Manaus-Caracarai road, km 130, igarapé Lages, 31 VIII 1974, *Prance 21693* (NY bc 1183373); rio Cuieiras, *sup.* mouth of rio Brancinho, 11 IX 1973, *Prance P17712* (NY bc 1183382); mun. São Gabriel da Cachoeira, alto rio Negro, próximo a boca do igarapé Tuari, lago Amaro, do lado oposto à ilha de Aparecida, 00° 20' N, 67° 19' W, 06 XI 1987, *Rodrigues 10867* (NY bc 1183413); rio Cuieiras, Tucunaré, margem direita, pouco abaixo do Repartimento, 16 IX 1964, *Rodrigues 6056* (NY bc 1183409). **COLOMBIA. Guainía:** *ca.* 5 km N of Boca de Casiquiare (where Negro, Guainía and Casiquiare rivers join), S side of caño, 01° 57' N, 67° 07' W, 120 m, 05 II 1980, *Liesner 9075* (NY *s.n.*). **VENEZUELA. Amazonas:** depto. Casiquiare, *ca.* 20 km al SE de San Fernando de Atabapo, 03° 50' N, 67° 47' W, 110 m, 16 I 1988, *Aymard 6522* (VEN 268986); mun. Atures, 75 km S de Puerto Ayacucho, 05° 05' N, 67° 40' W, 120 m, 06 IV 2005, *Aymard 12599* (VEN 394282, PORT *s.n.*); rio Negro, at base of cerro Cucuy, 02 III 1944, *Baldwin 3204* (VEN 486); depto. Casiquiare, alrededores de Yavita (rio Temi) y cerca de la carretera Yavita-Pimichín hacia el km 5 hacia Pimichín, 125–140 m, 6–19 VII 1969, *Bunting 3845* (MY 21013, U bc 283470, VEN 295452); depto. Atabapo, en los alrededores de Canaripó, en la margen izquierda (S) del bajo rio Ventuari, *ca.* 20 km al E de la confluencia con el rio Orinoco, 04° 03' N, 66° 49' W, 98 m, 01 VI 1978, *Huber 1993* (NY *s.n.*, VEN 213719); rio Ventuari, from mouth of rio Parú to Las Carmelitas, 19 II 1950, *Maguire 31572* (NY *s.n.*); rio Pasimoni, 01° 28' 40,7" N, 66° 33' 12,5" W, 28 I 2005, *Redden 3386* (PORT 94438, VEN 386123); Canaripo, lado S del rio Ventuari, 04° 05' N, 66° 50' W, 28 XII 1976, *Steyermark 112820* (U bc 283484, VEN 117884); alto Orinoco, selvas de Yavita, 128 m, 02 II 1942, *Williams 14133* (G bc 374713, VEN 11241); caño Pavón, río o caño San Miguel, rio Guainía, alto rio Negro, 125–127 m, 26 III 1942, *Williams 14902* (G bc 374601, G bc 374601, MY 58493, NY *s.n.*, VEN 284817); alto rio Negro, Guainía, Pimichín, 127 m, 01 IV 1942, *Williams 14943* (VEN 284816); alto Casiquiare, Capihuara, 120 m, 26 V 1942, *Williams 15565* (VEN 284818).