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Three new species of *Sloanea* (Elaeocarpaceae)

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Abstract

This work is part of a study of the genus *Sloanea* in the extra-Amazonian region of Brazil. Based on a consultation of Brazilian and European herbaria collections, and collection expeditions to areas in which *Sloanea* occurs, we describe three new species: *Sloanea filiformis*, *S. subsessilis*, and *S. uniflora*.

Key words: Brazil, Amazon, Cerrado

Introduction

Sloanea Linnaeus (1753: 512) is a genus that occurs in both the Old and New World, and comprises 150 species (Mabberley 2008). About 70 of these species are found in a variety of vegetation types within the Neotropics. The genus revision carried out for the extra-amazonian region of Brazil (Sampaio 2009) led to the recognition of three new species that occur mainly in the Amazon region in gallery forests of Brazilian savannas ('cerrado'). We classify them according to the subgeneric divisions proposed by Smith (1954). *Sloanea uniflora* and *Sloanea subsessilis* belong to *Sloanea* subgenus *Quadrisepala* Smith (1954: 76), based on the complete coverage of the floral organs by the sepals in bud just before anthesis. In *Sloanea filiformis*. the sepals do not fully cover the floral organs in bud just before anthesis, leaving the stamens exposed while still immature, this species is therefore included in *Sloanea* subgenus *Sloanea* (Smith 1954).

Taxonomic Treatment

Sloanea filiformis* D.Sampaio & V.C.Souza, *sp. nov. (Fig. 1)

Affinis Sloanea rufa stylo 4-basen versus partitus et antherarum connectivum aristatus differt.

Type:—BRAZIL. Bahia: Barreiras, margem do Rio de Janeiro, floresta de galeria, 2 November 1987, *Queiros 2105* (holotype UEC!, isotypes HUEFS!, K!).

Tree 4–5 m high. Branchlets rufous-tomentose, not lenticelate, striate; apical bud rufous-tomentose, covered by many cataphylls; axillary buds tomentose. Leaves alternate to subopposite, concentrated or not at the apex of the branches; stipules ca. 5 mm long, 2–3 mm wide, rufous-tomentose, ovate or lanceolate, persistent on young branches; petioles 1–6 cm long, densely rufous-pubescent, striate, finely caniculate on the upper portion; leaf blade 8–20 cm long, 5.5–12 cm wide, rufous-tomentose on the abaxial surface, sparsely puberulent on the adaxial surface, elliptical or obovate, base obtuse, apex obtuse or rounded, margin finely serrate; venation craspedodromous, midrib grooved on the adaxial surface, prominent on the abaxial surface;

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FIGURE 1. *Sloanea filiformis*. **A)** Flowering branch; **B)** Open flower; **C)** Detail of stamen; **D)** Detail of the flower; **E)** Detail of ovary (*Queiroz et al. 2105*); **F)** Detail of the branch with fruits (*Amorim et al. 574*).

domatia absent. Inflorescences axillary or cauliflorous botryoids; peduncle 1–2.5 cm long, sparsely tomentose, laterally flattened, striate; bracts deciduous, not observed; bracteoles 2–3 mm long, ca. 1 mm wide, rufous-tomentose, ovate, entire or lacerated, persistent; pedicels 1–4 mm long, sparsely tomentose, flattened, striate. Flowers with 6–8 sepals, not covering the reproductive organs in the floral bud just before anthesis, 3–4 mm long, ca. 1 mm wide, densely rufous-pubescent on both surfaces, lanceolate, variable in size and shape, uniseriate, apex acuminate, margin flat; filaments ca. 1.5–2 mm long, pubescent; anthers ca. 1–1.5 mm long, pubescent, elliptical or ovate; connective prolonged into a long aristate awn, 3–3.5 mm long, glabrous; ovary ca. 2 mm long, rufous-tomentose, elliptical, sessile; style ca. 4–6 mm long, glabrous, deeply 4-divided to the base; floral receptacle pubescent. Fruit with 4 valves, 1.5–3 cm long, 0.4–0.5 cm wide, elliptical, pubescent to densely pubescent, covered by pubescent bristles with setulose apex, 3–4 mm long. Seed 1, ca. 20 mm long, ca. 7 mm wide, elliptical, aril red or orange.

Habitat:—Savanna and Amazonian forests.

Distribution:—*Sloanea filiformis* occurs in Brazil, and it was collected in gallery forests of Bahia State, north of Mato Grosso State, as well as in the Amazon Rainforest of Rondônia State.

Etymology:—From the Latin *filiformis*, meaning thread-like, referring to the connective which is prolonged into a long aristate awn.

Observations:—*Sloanea filiformis* is characterized by the connective which is prolonged into an aristate awn, and by the style which is deeply 4-fid to the base. This species is considered to be similar to *Sloanea rufa* Planch. ex Bentham (1861: 68) due to its rufous hairs that cover the vegetative and reproductive structures, and also due to the shape (elliptical or obovate) and size (8–20 cm long) of the leaf blade. However, *S. filiformis* has stipules with entire margins which are deciduous on older branches. *Sloanea rufa* has the style divided into four only at the apex, its connective is prolonged up to 1.5 mm long, and its stipules are fimbriate and persistent on mature branches. *Sloanea filiformis* flowers from August to November, and fruits from June to September.

Paratypes:—BRAZIL. Bahia: Barreiras, margem do Rio de Janeiro, floresta de galeria, *Queiros 2105* (HUEFS, UEC, K); Barreiras, estrada para Brasília, BR 242, Cachoeira do Acaba Vida no Rio de Janeiro, mata de galeria, *Amorim et al. 574* (CEPEC, K). Mato Grosso: Alta Floresta, ca. 3 km N of road from Alta Floresta to River Apiacá, *Thomas et al. s.n.* (INPA, K, MG, NY); Sinop, 7 km E of BR 163, N of Rio Celeste, *Thomas et al. s.n.* (INPA, K, MG, NY); Xavantina, ca. 6 km of Xavantina, *Argent et al. s.n.* (K). Rondônia: Porto Velho, UHE Samuel, dique da margem esquerda, ramal do desmatamento da Pedreira, solo argiloso, *Dionizia et al. s.n.* (INPA, K).

Sloanea subsessilis **D.Sampaio & V.C.Souza,** ***sp. nov.*** (Fig. 2)

Affinis Sloanea floribunda sed ovario sessili, folio subsessili et stylo apice 4-partitus differt.

Type:—BRAZIL. Mato Grosso: Barra do Bugres, Fazenda Ochsenfeld, mata de galeria, 23 October 1995, *Hatschbach et al. 63790* (holotype MBM!).

Tree 6–8 m high. Branchlets puberulent, sparsely lenticellate, finely striate; apical bud not observed; axillary buds puberulent. Leaves opposite to alternate, concentrated at the apex of the branches; stipules early deciduous, not observed; petioles 2–4 mm long, puberulent to glabrous, striate; leaf blade 7–23 cm long, 3.5–11 cm wide, glabrous on both surfaces, elliptical or obovate, base cordate or cuneate, apex acuminate to cuspidate, margin entire; venation brochidodromus, midrib flat or slightly prominent on adaxial surface, prominent on abaxial surface; domatia absent. Inflorescences axillary or terminal, botryoid; peduncle 1–5 cm long, puberulent, not lenticelate, striate; bracts 2–2.5 mm long, ca. 2 mm. wide, pubescent, ovate, entire, persistent; bracteoles 2–2.5 mm long, ca. 0.5 mm wide, puberulent, filiform, entire, persistent; pedicels 6–20 mm long, puberulent, striate. Flowers with 4 sepals, covering the reproductive organs in the bud just before

anthesis, 5–8 mm long, 2–4 mm wide, pubescent or puberulent on both surfaces, lanceolate, equal, entire, rarely ovate, uniseriate, apex acuminate; margin revolute, densely pubescent to tomentose on both surfaces; filaments 2–4 mm long, hirsute; anthers 2–3 mm long, pubescent, oblong; connective prolonged into a short acuminate awn, ca. 1 mm long, puberulent to glabrous; ovary ca. 2 mm long, short-pubescent, globose, sessile; style ca. 5 mm long, short-pubescent, straight, 4-fid at the apex; floral receptacle short-pubescent. Fruits not observed.

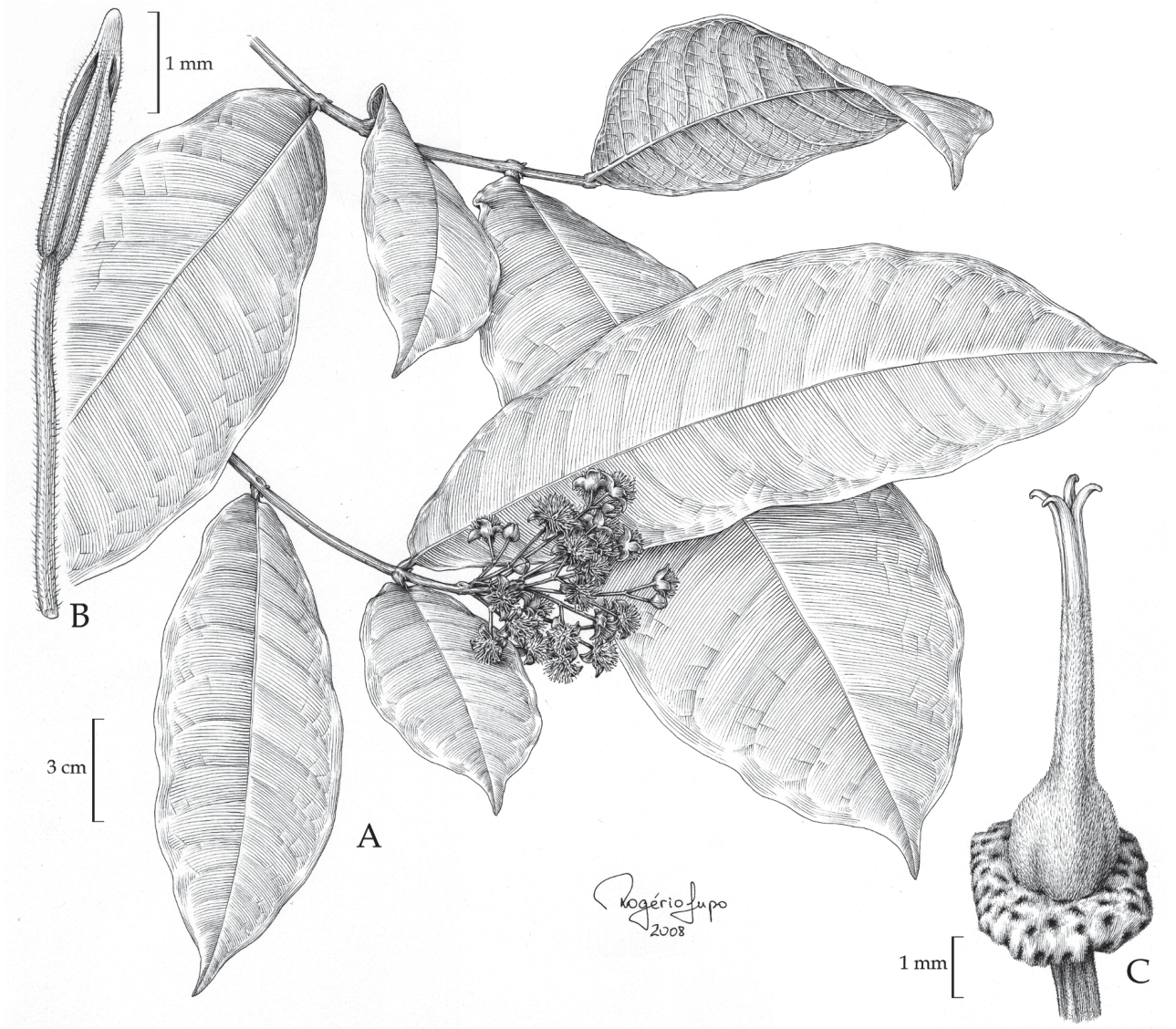

FIGURE 2. *Sloanea subsessilis*. **A)** Flowering branch; **B)** Detail of stamen; **C)** Detail of ovary (*Hatschbach et al. 63790*).

Habitat:—Savanna and Amazonian gallery forests.

Distribution:—*Sloanea subsessilis* occurs in Mato Grosso State, Brazil and in Bolivia.

Etymology:—From the Latin *sub-*, meaning not completely, a little; and from the Latin *sessilis*, meaning stalkless or apparently so, referring to the very short petioles (2–4 mm long).

Observations:—*Sloanea subsessilis* may be confounded with *Sloanea floribunda* Spruce ex Bentham (1861: 66) due to vegetative similarities such as entire leaf margins and blades completely glabrous on both species. It is also possible to point out some similarities between their leaf blade: obovate shape in *S. floribunda,* and elliptical or obovate shape in *S. subsessilis*; 7.5–20 cm long in *S. floribunda* and 7–23 cm long in *S. subsessilis*; base cordate or obtuse in *S. floribunda* and cordate or cuneate in *S. subsessilis*; apex

acuminate in *S. floribunda* and acuminate or cuspidate in *S. subsessilis*. However, these two species can be easily distinguished by the following characteristics: type of inflorescence (thyrsoid in *S. floribunda* vs. botryoid in *S. subsessilis*), position of the ovary (stipitate in *S. floribunda* vs. sessile in *S. subsessilis*), shape of the style (entire in *S. floribunda* vs. 4-fid at the apex in *S. subsessilis*), and the size of the petiole (1.2–3.5 cm long in *S. floribunda* vs. 2–4 mm long in *S. subsessilis*). *Sloanea subsessilis* has been collected in flower in October and February.

Paratype: BOLIVIA. Beni: Arroyo just N of Guayaramerin, Rio Mamor, *Anderson 12078* (K, NY).

Sloanea uniflora **D.Sampaio & V.C.Souza, *sp. nov.*** (Fig. 3)

Affinis Sloanea garckeana sed inflorescentis uniflora et ovario trichomatibus brevibus ramosis differt.

Type:—BRAZIL. Mato Grosso: São Félix, beira do Rio das Mortes, 17 March 1997, *Souza et al. 14379* (holotype ESA!, isotype SPSF!).

Tree or shrub, 2–12 m high. Branchles sparsely pubescent to tomentose, scarcely glabrous, lenticellate, striate; apical bud tomentose, covered by many cataphylls; axillary buds tomentose. Leaves alternate to sub-opposite, concentrated at the apex of the branches; stipules 2.5–5 mm long, ca. 1 mm. wide, pubescent, lanceolate, persistent on young branches; petioles 1–3 cm long, pubescent to tomentose on the upper portion, scarcely glabrous, striate; leaf blade 5.5–16.3 cm long, 2.5–7.7 cm wide, sparsely pubescent on the abaxial surface, glabrous on the adaxial surface, elliptical to obovate, base cordate or obtuse, apex acute or acuminate, margin entire or undulate; venation brochidodromous or semi-craspedodromous only on upper portion of leaf blade, midrib prominent on abaxial surface, flat on adaxial surface, domatia absent. Inflorescences axillary, unifloral; peduncle 2–4.3 cm long, sparsely tomentose, glabrous or puberulent, striate; bracts early deciduous, not observed; bracteoles ca. 3 mm long, ca. 1 mm wide, puberulent, lanceolate, entire, early deciduous; pedicels 1–1.5 cm long, puberulent, striate. Flowers with 4 sepals, covering the reproductive organs in bud just before anthesis, 9–12 mm long, 5–7 mm wide, tomentose on both surfaces, ovate, entire, equal, uniseriate, apex acuminate, margin revolute and white-velutinous on inner surface; filaments 3–4 mm long, densely pubescent; anthers 2–4 mm long, pubescent, elliptical or lanceolate; connective prolonged into an aristate awn, 1–2 mm long, pubescent on the lower third, glabrous on the upper portion; ovary ca. 4 mm long, short-pubescent, oval, with branched trichomes, rare simple trichomes, sessile; style 3–4 mm long, twisted or straight, apex entire, pubescent on basal portion, glabrous on the apical portion; floral receptacle pubescent. Fruit with 4 (5) valves, 2–4 cm long, 1.5–2.5 cm wide, ellipsoid or orbicular, pubescent and externally covered by setulose bristles, 1–2 mm long. Seed 1, ca. 10 mm long, ca. 0.5 mm wide, elliptical, aril not observed.

Habitat:—Savanna and Amazonian forests.

Distribution:—*Sloanea uniflora* occurs in the Amazon rainforest of Bolivia and Brazil, in the states of Amazonas, Roraima, Par, Maranhão, and Tocantins, it also occurs in gallery forests, often at waterlogged sites or close to watercourses in the states of Mato Grosso, Mato Grosso do Sul, and Goiás.

Etymology:—From the Latin *uniflora*, meaning one flower, referring to the single-flowered inflorescences.

Observations:—*Sloanea uniflora* is a species similar to *Sloanea garckeana* Schumann (1886: 177), but can be distinguished from it by its single-flowered inflorescences (triads in *S. garck*eana); shortpubescent indument, with branched trichomes on the ovary (velutinous in *S. garckeana*), connective prolonged into a short aristate awn, 1–2 mm long (aristate, 2–4 mm long in *S. garckeana*); leaf blades with a cordate base (acute or cuneate in *S. garckeana*), and fruit densely covered by red, extremely stinging bristles, 1–2 mm long (brown bristles, not stinging, 3–5 mm long in *S. garckeana*). *Sloanea uniflora* flowers from March to June, and fruits from May to September.

FIGURE 3. *Sloanea uniflora*. **A)** Flowering branch (*Souza et al. 14379*); **B)** Branch with mature fruits (*Santos & Rodrigues 918*); **C)** Detail of ovary; **D)** Detail of the trichome that covers the ovary; **E** and **F)** Detail of stamen (*Souza et al. 14379*).

Paratypes: BOLIVIA. Santa Cruz: Prov. Velasco, Estación Flor de Oro, margem del Rio Itenez, fronteira com Rondônia, *Peña 189* (K, SCZ); Prov. Velasco, Reserva Ecológica el Refugio, empalme dos rios Tarbo e Paraguá, *Guillén 1897* (K, MO); Reserva Ecológica el Refugio, *Guillén & Chore 3290* (K, MO); Reserva Ecológica el Refugio, *Guillén & Chore 2925* (K, MO); Reserva Ecológica el Refugio, *Guillén & Coria 1340* (K, MO); Reserva Ecológica El Refugio, *Guillén & Roca 3294* (F). BRAZIL. Amazonas: Rio Marupi, margens do Rio, projeto RADAM, quadricula NA–21–YA, *Pena 375* (IAN); Rio Utuxi, vicinity of Boca do

Curuquete, *Prance et al. 14149* (K, NY). Goiás: Alvorada, coletado às margens do rio Canabrava, vegetação Floresta de Galeria, *Dambios 752* (RB, HRB); Macaúba, Ilha do Bananal, Parque Nacional do Araguaia, *Ratter et al. s.n.* (UB); Margem do Rio Araguaia, floresta aluvial, solo arenoso, *Mileski 109* (HRB). Maranhão: Ilha de São Luiz, terra firme, *Froes 11582* (K, NY). Mato Grosso: Barra do Garça, Serra do Roncador, 50 km da Base Camp, *Eiten & Eiten 8925* (UB, SP, P); Cocalinho, *Rozza et al. 457* (ESA); Garapu, 3 Km de Garapu, Serra do Roncador, margem do Rio Sete de Setembro, *Prance & Silva s.n.* (UB); Gaúcha do Norte, margem alta do Rio Tuatuari, *Andrade-Lima s.n.* (ESA, IPA, RB); Juruena, beira do Rio Juruena, floresta aluvial, *Souza et al. 18607* (ESA, MT); Porto dos Gaúchos, beira do Rio Arinos, floresta aluvial, *Nave et al. 1875* (ESA, MT); Posto indígena Cap. Vasconcelos, margem alta do Rio Tuatuari, *Lima s.n.* (K); Região de Cocalinho, *Árbocz et al. 4586* (ESA); Rio Juruena, Mata de Igap, *Silva & Maria 3352* (INPA, K, MG, NY, RB); margem direita da Cachoeira Salto Augusto, *Rosa & Santos 2026* (IAN, INPA, MO, NY); Rio Xingu, *Becker s.n.* (HRB); Sui Missu ferry, about 40 km NW of base camp, *Harley et al. 10227* (BHCB, CESJ, HFC, HUEFS, M, P, RB, UB); São Félix, Fazenda Patizal, swampy forest by old river course (Lagoa Morte), *Richards 6503* (K, UB); São Félix do Araguaia, beira do Rio das Mortes, *Souza et al. 14379* (CTES, ESA, MBM, MT, PORT, RB, SPSF); Serra do Roncador, banks of Rio Sete de Setembro, *Prance & Silva 59255* (K, NY); Sinop, estrada BR-163, junção do Rio Caiubi com Telles Pires, *Nave et al. 1668* (ESA, MT); Vila Bela da Santíssima Trindade, Rio Guapor, *Hatschbach et al. 67019* (MBM); Rio Guapor, *Hatschbach et al. 67025* (MBM); Xavantina, 290 Km N de Xavantina, próximo ao Rio Suiamiçu, *Ratter & Castro s.n.* (P, UB); 1,5 Km W do Rio Suiamiçu, 290 Km N de Xavantina, *Ratter et al. s.n.* (P, UB). Mato Grosso do Sul: Rio Negro, Rio Anhuma, sub-região de Aquidauana, Pantanal, próximo ponte, *Pott et al. 3624* (CPAP). Par: Conceição do Araguaia, beira do rio, terreno alagável, *Fróes 29724* (IAN); Maracan, Campo de Martius Pinheiro, *Silva s.n.* (K, NY); Marap, dentro da água do Rio Marap, *Rosa 73* (IAN); Serra dos Carajás, near camp at Serra Norte, *Daly et al. s.n.* (INPA, K, MG, NY). Roraima: Alto Alegre, SEMA Ecological Reserve, *Hopkins et al. 519* (INPA, K, MG, NY, INPA, MG); Ilha de Marac, SEMA Ecological Reserve, *Ratter & Milliken s.n.* (K); margem esquerda da BR 402, Fazenda Surrão, *Rosa & Cordeiro 1534* (INPA, MBM, INPA). Tocantins: Lagoa da Confusão, Fazenda Lago Verde, *Leão et al. s.n.* (HRCB, HTINS); Peixe, Fazenda Agropecuária Água Branca, margem da mata de galeria, *Santos & Rodrigues 918* (HTINS, UB); Pium, Ilha do Bananal, Parque Nacional do Araguaia, próximo à ponta da Ilha, Fazenda Velha do Rio Mercês, solo arenoso, *Silva et al. 4199* (EAC, IBGE, K, NY, RB, UB, US).

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