Paubrasilia Artigo Original — Seção Especial Floras Locais

doi: 10.33447/paubrasilia.2024.e0136 2024;7:e0136

Taxonomic study of *Sloanea* L. (Elaeocarpaceae) in the Metropolitan Region of Belém, Pará, Brazilian Amazon

Estudo taxonômico de Sloanea L. (Elaeocarpaceae) na Região Metropolitana de Belém, Pará, Amazônia Brasileira

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Palavras-chave:
Amazônia oriental. Florística. Morfologia. Oxalidales. Taxonomia.

***Keywords*:**
Eastern Amazon. Floristic. Morphology. Oxalidales. Taxonomy.

Recebido em: 21/09/2023
Aceito em: 21/05/2024

Editor responsável: Jorge Antonio S. Costa (UFSB)

eISSN: 2595-6752

Abstract

This study aims to contribute to the knowledge of the taxonomy of *Sloanea* (Elaeocarpaceae) in the Metropolitan Region of Belém, Pará State, Brazilian Amazon. Eight species of *S. loanea* were recorded: *S. floribunda*, *S. grandiflora*, *S. granulosa*, *S. guianensis*, *S. nitida*, *S. porphyrocarpa*, *S. sinemariensis*, and *S. terniflora*. Identification keys, morphological descriptions, geographical distribution, and taxonomic comments are provided for the species treated.

Resumo

Este estudo objetivou contribuir para o conhecimento taxonômico de Sloanea (Elaeocarpaceae) na Região Metropolitana de Belém, no estado do Pará, Amazônia Brasileira. Foram registradas oito espécies de Sloanea: S. floribunda, S. grandiflora, S. granulosa, S. guianensis, S. nitida, S. porphyrocarpa, S. sinemariensis e S. terniflora. São fornecidas chave de identificação, descrições morfológicas, informações sobre distribuição geográfica e comentários taxonômicos das espécies tratadas.

Introduction

Elaeocarpaceae Juss. comprises 12 genera and approximately 600 species (Sampaio, 2020) and is placed within the order Oxalidales (Angiosperm Phylogeny Group [APG], 2016). The family is distributed in tropical and subtropical regions, with some genera occurring in temperate zones (Angiosperm Phylogeny Group [APG], 2009). In Brazil, the family is represented by 47 species of the genera *Crinodendron* Molina (1 species), *Elaeocarpus* L. (3 spp.) and *Sloanea* L. (43 spp.), 12 of which are endemic (Sampaio, 2020; Sampaio; Teixeira, 2024).

The genus *Sloanea* comprises approximately 127 species in the New World, found from northwestern Mexico to northern Argentina, and in the West Indies (Pennington; Wise, 2017; Sampaio, 2020). In Brazil, the genus can be found in all Brazilian states and most frequently in areas with more humid and preserved forest formations (Sampaio; Souza, 2016). It is represented by 43 species, 10 of which are endemic to the country (BFG, 2018; Sampaio, 2020). Among the 34 species recorded in the Amazon, 18 have been recorded in the state of Pará (Sampaio, 2020). However, taxonomic studies focused on *Sloanea* species are still few in this state.

The Metropolitan Region of Belém (MRB) is part of the Belém Center of Endemism, a region of the Brazilian Amazon characterized by a history of intense deforestation and human occupation (Amaral et al., 2012). The expansion of urban areas in the MRB constantly threatens the forest remnants. The loss of biodiversity and local extinction of species before their discovery and investigation are some of these threats. The MRB has five major conservation areas: Área de Proteção Ambiental da Região Metropolitana de Belém (APA Belém); Parque Estadual do Utinga "Camillo Vianna", inserted in the Environmental Protection Area of the MRB (APA Região Metropolitana de Belém); Refúgio de Vida Silvestre (REVIS) Metrópole da Amazônia; Área de Proteção Ambiental da Ilha do Combu (APA da Ilha do Combu); and Parque Ecológico do Gunma (Costa; Pietrobom, 2010; IDEFLOR-BIO, 2023). Despite of that, floristic studies in the MRB are still insufficient to support the management planning and conservation of plant resources, especially aimed at *Sloanea* species.

Taxonomic studies of *Sloanea* in the MRB are therefore necessary, mainly to support conservation strategies of endangered species and of the phytophysiognomies of the MRB. Here we present a taxonomic treatment of *Sloanea* species from the MRB based on the study of specimens deposited in the main Amazonian herbaria so as to increase the knowledge of this family in the Amazon region.

Material and Methods

Study area

The Metropolitan Region of Belém (MRB) was established in the 1970s through the Complementary Law 14/1973 of the Federal Constitution, is located in the northeast of the state of Pará, in the eastern portion of the Amazon, and since 2011, circumscribes seven municipalities: Belém (the capital of the state of Pará), Ananindeua, Benevides, Castanhal, Marituba, Santa Bárbara do Pará, and Santa Isabel do Pará (Pereira; Vieira, 2016) (Figure 1).

According to IBGE (2022), the MRB has an estimated population of 2.5 million inhabitants, which represents almost a third of the population of the Pará concentrated in an area that corresponds to less than 1% of the territory of the state. Due to urban sprawl, the original forest cover of the MRB has been decimated (Amaral et al., 2009). Humid equatorial climate predominates in the MRB, with an average temperature of 25 °C, small thermal amplitude, and relative humidity around 85%. The rainfall regime has an average of 2,500 - 2,800 mm/year, with heavy rainfall from January to April. Altitudes in the MRB are low, varying from 4 to 75 m, with lower areas (e.g. in Belém) subjected to frequent flooding due to the influence of high tides, and areas with higher altitudes in Castanhal. Formed by continental and insular areas, the MRB has terra firme (upland), várzea (white-water floodplain), and igapó (black-water floodplain) forests. The vegetation in the study area is mainly characterized by secondary forests (IDESP, 2023).

Taxonomic treatment

Physical voucher material and digital images of specimens from herbaria with relevant collections of Amazonian plants, namely, ALCB, FLOR, IAN, INPA, MFS, MG, R, and RB [acronyms according to Thiers (continuously updated)], were examined. The specimens were examined under a stereomicroscope and the vegetative and reproductive structures were measured with the aid of a digital caliper and a ruler. The flowers were rehydrated, stored in 70% ethanol, dissected, measured with graph paper, and described by examination under a stereomicroscope.

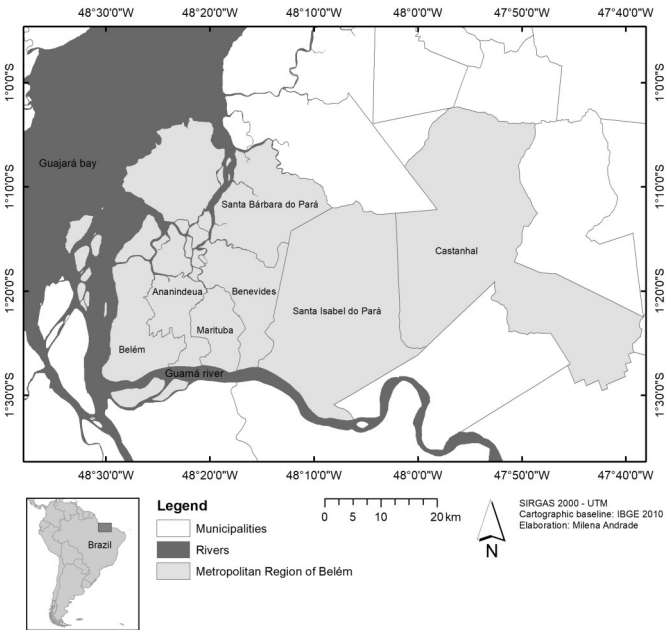


Figure 1. Map of the Metropolitan Region of Belém (MRB).

The terminology used for the morphological characterization was based on Smith (1954) and Sampaio and Souza (2016) for vegetative and reproductive organs; Gonçalves and Lorenzi (2011) for trichomes and indumenta, leaf apex, base and margins; Ellis et al., (2009) for venation; and Barroso et al., (1999) for fruits and seeds. Author names are abbreviated in accordance with Brummitt and Powell (1992). Geographic distribution data follow Pennington and Wise (2017) and Sampaio (2020). Information on habitat and phenology was obtained from herbarium voucher labels.

Results and Discussion

The present literature survey and the study of herbarium specimens resulted in the record of eight species of *Sloanea* from the MRB.

Sloanea L., Sp. Pl. 1: 512, 1753.

Trees or shrubs, 1.2–30 m in height. Branchlets usually lenticellate. Leaves alternate, opposite or subopposite, distributed along the branches or concentrated at the apex of the branches; leaf blades elliptical, lanceolate, obovate or oblong, apex acuminate, acute or obtuse, base acute, cordate, cuneate, obtuse or rounded, margin entire, irregular, serrated, undulate or slightly undulate; venation brochidodromus or craspedodromous. Inflorescences axillary or terminal, racemose, thyrsoid, botryoid, ramiflorous. Sepals equal or unequal, usually free. Petals absent. Connective prolonged, acute or aristate. Ovary sessile or with stipe; style entire or parted. Fruit a loculicidal capsule, variable shape and size, with 3–5 valves, woody, armed with flexible or rigid bristles, straight or curved. Seeds 1–many per capsule, covered up to the mid region or entirely by an aril.

Key to the species of *Sloanea* occurring in the Metropolitan Region of Belém

1. Venation brochidodromous, tertiary veins mixed percurrent…..2
   Venation craspedodromous, tertiary veins percurrent……...…..3
2. Leaves alternate, base of leaf blade cordate or obtuse; inflorescence thyrsoid; sepals apex acuminate, margin revolute, covering the reproductive organs in the floral bud; connective aristate, hirsute; ovary globose, stipitate; style 2 mm long, apex entire; fruit globose.....***S. floribunda*** Spruce ex Benth.
   Leaves opposite, base of leaf blade acute; inflorescence racemose; sepals apex acute, margin entire or dentate, not covering the reproductive organs in the floral bud; connective acute, glabrous; ovary elliptical, sessile; style 4–7 mm long, 4–parted at the apex; fruit elliptical.....***S. guianensis*** (Aubl.) Benth.
3. Primary and secondary veins grooved on the adaxial surface…….……...…***S. granulosa*** Ducke
   Primary and secondary veins flat on the adaxial surface..…...…..4
4. Fruit globose……...…….……..5
   Fruit ellipsoid……..…….……...……6
5. Leaves alternate, distributed along the branches; leaf blade elliptical, apex obtuse, base obtuse, margin irregular, serrated, glabrous on the adaxial surface, puberulous on the abaxial surface; fruit covered by stiff, contorted bristles; fruits with 6 seeds.....***S. grandiflora*** Sm.
   Leaves subopposite, concentrated at the apex of the branches; leaf blade obovate, apex acute, base cuneate, margin entire to undulate on the upper third of the blade, glabrous on both surfaces; fruit covered by flexible bristles; fruits with 1 seed.....***S. porphyrocarpa*** Ducke
6. Leaf blade lanceolate; seeds ovoid…….....***S. nitida*** G. Don.
   Leaf blade elliptical or obovate; seeds ellipsoid……..……..7
7. Tree up to 10 m in height; leaf blade glabrous on the adaxial surface except for the puberulous veins, puberulous on the abaxial surface; fruit bristles 4–7 mm long.....…...***S. sinemariensis*** Aubl.
   Tree 19–30 m in height; leaf blade glabrous on both sides, except for the veins; fruit bristles 2 mm long.....***S. terniflora*** (DC.) Standl.

1. *Sloanea floribunda* Spruce ex Benth., J. Proc. Linn. Soc., Bot. 5 (suppl.2): 66 (1861). (Figures 2a-b)

Tree, 10–26 m tall. Leaves alternate, distributed along the branches; leaf blade elliptical or oblong, 6–19.5 × 2.5–8 cm, apex acuminate, base cordate or obtuse, margin entire, glabrous on both sides, slightly leathery; venation brochidodromous, flat to slightly prominent on the adaxial surface, prominent on the abaxial surface; tertiary veins mixed percurrent. Inflorescence axillary or terminal, thyrsoid. Sepals 4, ovate or lanceolate, apex acuminate, margin revolute, pubescent on both sides, covering the reproductive organs in the floral bud. Filaments 1–2 mm long, pubescent; anthers 2–3 mm long, lanceolate, pubescent; connective aristate, 1–2 mm long, hirsute. Ovary 2 mm long, globose, pubescent, stipitate; style 2 mm long, straight, apex entire, glabrous. Fruit 2.6–3 × 2.3–2.5 cm, globose, glabrous, with 4 valves. Seeds 1, ovoid, 9–16 mm long, completely covered by the aril.

Material examined: BRAZIL, Pará: Belém, IPEAN, Igapó do Catú, 07/VI/1967, fl., *J.M. Pires & N.T. Silva* 10532 (IAN); *loc. cit.*, 22/X/1966, fr., *J.M. Pires & N.T. Silva* 10265 (IAN); Reserva Mocambo, 31/VII/1968, fl., *J.M. Pires & N.T. Silva* 11905 (IAN); *loc. cit.*, *J.M. Pires & N.T. Silva* 11901 (IAN). Marituba, Mata da Cia. Pirelli, Fazenda Uriboca, VIII/1958, fl., *J.M. Pires* 7072 (IAN).

Sloanea floribunda occurs in Bolivia, Costa Rica, Ecuador, French Guiana, Honduras, Panama, Peru, and Venezuela (Pennington; Wise, 2017). In Brazil, it is recorded in the states of Amapá, Amazonas, Maranhão, Mato Grosso, Pará, and Rondônia (Sampaio, 2020). In the MRB, *S. floribunda* was found in terra firme forest. Specimens with flowers were collected from June to August and with fruits in October.

Sloanea floribunda may be confused with *S. guianensis*, however, it can be distinguished by the alternate leaves (vs. opposite in *S. guianensis*), cordate or obtuse leaf base (vs. acute), thyrsoid inflorescence (vs. racemose), sepals with acuminate apex and revolute margins, covering the reproductive organs in the floral bud (vs. acute apex, entire or dentate margins, not covering the reproductive organs in the floral bud), aristate, hirsute connective (vs. acute, glabrous), globose, stipitate ovary (vs. ellipsoid, sessile), style measuring 2 mm in length, with entire apex (vs. 4–7 mm long, 4–parted at the apex), and globose fruits (vs. ellipsoid).

2. *Sloanea grandiflora* Sm., In Ress, Cycl. 33: 146 (1819). (Figures 2c, 3a-c)

Tree, 5–17.3 m tall. Leaves alternate, distributed along the branches; leaf blade elliptical, 17–39 × 16.5–22.5 cm, apex obtuse, base obtuse, margin irregular, serrated, glabrous on the adaxial surface, puberulous on the abaxial surface; venation craspedodromous, primary and secondary veins prominent on the abaxial surface, flat on the adaxial surface; tertiary veins percurrent. Inflorescence axillary, botryoid. Sepals forming a cup-shaped calyx, apex acute, margin entire, pubescent on both sides, not covering the reproductive organs in the floral bud. Filaments 2–3 mm long, pubescent; anthers 3–5 mm long, lanceolate, pubescent; connective acute, 1–2 mm long, glabrous. Ovary ovoid, 3–5 mm long, velutinous, sessile; style 9–12 mm long, straight, entire at the apex, velutinous at the base, glabrous at the apex. Fruit 2–3 × 1.3 cm, globose, pubescent, with 4 valves, covered by stiff, contorted, sparsely pubescent bristles, 15–30 mm long. Seeds 6, elliptical, 13–17 × 6–8 mm, completely covered by the aril.

Material examined: BRAZIL, Pará: Ananindeua, margem direita do Rio Aurá, Sítio do Sr. Evangelista, mata de várzea, 14/IV/2003, fr., *J. Oliveira & M.C. Nascimento* 627 (MG); Igarapé Aurá-cumbú, solo argiloso, mata de várzea, 25/V/2001, fl., *E.S.C. Gurgel & M.R. Cordeiro* (IAN 178479). Belém, Beira do Rio Guamá, UFPA, solo dumoso, várzea, 3/VI/2010, fl., *M.R. Cordeiro* 4970 (FLOR, IAN, MFS); "Museu" [Museu Paraense Emílio Goeldi], 3/II/1947, fl., *A. Ducke* 2062 (IAN, MG, R); Horto do Museu Goeldi, 15/VIII/1976, fl. & fr., *M.G. Silva* 2861 (MG); 16/VII/1957, fl., *P.B. Cavalcante* 231 (MG); Caraparú, 24/X/1957, fl., *W.A. Egler* 621 (MG); IPEAN, na mata de capoeira do igarapé Água Preta, terreno

de várzea margem da estrada da Bomba do Utinga, 27/III/1967, fr., *J.M. Pires & N.T. Silva* 10350 (IAN); Reserva Aurá, 1/VII/1968, fl., *J.M. Pires & N.T. Silva* 11852 (IAN); 10/VII/1968, fl., *J.M. Pires & N.T. Silva* 11874 (IAN); 9/VIII/1967, fr., *J.M. Pires & N.T. Silva* 10702 (IAN); Igarapé do Aurá, in APEG Reserve, 12/VI/1969, fl., *D.F. Austin* 4194 (IAN); Fazenda Aurá, 16/XII/1949, fr., *G.A. Black* 49-8622 (IAN). Marituba, Fazenda Pirelli, mata de várzea a 2,5 km do rio Oriboca, 31/VII/1997, fr., *S.V. Costa Neto* 188 (MG). Santa Isabel do Pará, Frechal, solo argiloso, mata de várzea, 19/VIII/2001, *M.R. Cordeiro* (IAN 175388).

This species is distributed in Bolivia, Ecuador, French Guiana, Guyana, Panama, Suriname, and Venezuela (Pennignton; Wise, 2017). In Brazil, it occurs in the states of Acre, Amazonas, Amapá, and Pará (Sampaio, 2020). In the study area, it was found in várzea forests. Specimens with flowers were collected from October to June and with fruits from June to July.

Sloanea grandiflora is similar to *S. porphyrocarpa*, but it is distinguished by the alternate leaves which are distributed along the branches (vs. subopposite and concentrated at the apex of the branches in *S. porphyrocarpa*), elliptical leaves with obtuse apex and obtuse base, irregular, serrated margins, glabrous adaxial surface and puberulous abaxial surface (vs. obovate leaves with acute apex and cuneate base, entire to undulate margins on the upper third of the blade, and glabrous adaxial and abaxial surfaces), and fruits covered by stiff, contorted bristles (vs. covered by flexible bristles) with 6 seeds (vs. 1 seed).

3. *Sloanea granulosa* Ducke, Bol. Tecn. Inst. Agron. N. 19: 13 (1950).

Tree. Leaves alternate, concentrated at the apex of the branches; leaf blade elliptical or obovate, 8–11.5 × 4.5–7 cm, apex acute or obtuse, base acute, margin undulate, glabrous on the adaxial surface, pubescent on the abaxial surface; venation craspedodromous, primary and secondary veins grooved on the adaxial surface, prominent on the abaxial surface; tertiary veins percurrent. Inflorescence axillary, botryoid. Sepals 4–5, ovate, apex acute, margin entire, pubescent on both sides, not covering the reproductive organs in the floral bud. Filaments 2 mm long, pubescent; anthers 1 mm long, elliptical, pubescent; connective acute, less than 0.5 mm long, glabrous. Ovary globose, 2 mm long, sessile, pubescent; style 3–4 mm long, straight, 4-parted at the apex, pubescent at the base and glabrous at the apex. Fruits not seen.

Material examined: BRAZIL, Pará: Belém, mata do Catu, 22/XI/1944, fl., *R.L. Fróes* 20783 (IAN).

Sloanea granulosa occurs in French Guiana, Amazonian Brazil (Pará), and Amazonian Peru (Pennington; Wise, 2017; Sampaio, 2020). In the MRB, it was found in non-flooded areas. Specimens with flowers were collected in November.

It can be easily differentiated from the other species of the genus that occur in the MRB by the primary and secondary veins which are grooved on the adaxial surface and prominent on the abaxial surface.

4. *Sloanea guianensis* (Aubl.) Benth., J. Proc. Linn. Soc., Bot. 5 (Suppl. 2): 69 (1861).

Tree or shrub, 1.2–10 m tall. Leaves opposite, distributed along the branches; leaf blade elliptic, 5.5–12.2 × 2.3–4.5 cm, apex acuminate or acute, base acute, margin entire, glabrous on the adaxial surface, except for the veins, glabrous on the abaxial surface; venation brochidodromous, primary and secondary veins flat on the adaxial surface, prominent on the abaxial surface; tertiary veins mixed percurrent. Inflorescence axillary, racemose. Sepals 4–7, lanceolate, apex acute, margin entire or dentate, pubescent on both sides, not covering the reproductive organs in the floral bud. Filaments 2–3 mm long, hirsute; anthers 0.5–1 mm long, lanceolate or linear, pubescent; connective acute, 0.5–1 mm long, glabrous. Ovary ellipsoid, ca. 2 mm long, dense pubescent, sessile; style 4–7 mm long, straight or contorted, 4–parted at the apex, pubescent at the base, glabrous at the apex. Fruit 0.8 × 0.4 cm, ellipsoid, pubescent, with 4 valves, covered by pubescent bristles, ca. 5 mm long. Seeds not seen.

Material examined: BRAZIL, Pará: Belém, 15/XI/1947, fl. & fr., *G.A. Black* 830 (IAN); Bosque Municipal, 5/IV/1947, fr., *J.M. Pires & G. A. Black* 1428 (ALCB, IAN); *loc. cit.*, 16/VII/1947, fl., *N.T. Silva* 52 (IAN, INPA); mata da terra firme, 31/VIII/1948, fl., A. *Ducke* 2160 (IAN); On lands of Instituto Agronomico do Norte, 4 km SO of administration building, VI/1944, fr., A. *Silva* 349 (IAN); South woods, I.A.N., 24/XII/1942, fr., W.A. *Archer* 8059 (IAN).

Sloanea guianensis is distributed in Bolivia, the Caribbean, Colombia, Costa Rica, Ecuador, French Guiana, Guyana, Nicaragua, Peru, Suriname, and Venezuela (Pennington; Wise, 2017). In Brazil, it occurs throughout the country (Sampaio, 2020). In the study area, *S. guianensis* was found in terra firme forest. Specimens with flowers were collected from July to November and with fruits from April to December. *Sloanea guianensis* resembles *S. floribunda* and their affinity is discussed in the comments of the latter.

5. *Sloanea nitida* G. Don, Gen. Hist. 1: 555 (1831). (Figures 3d-e)

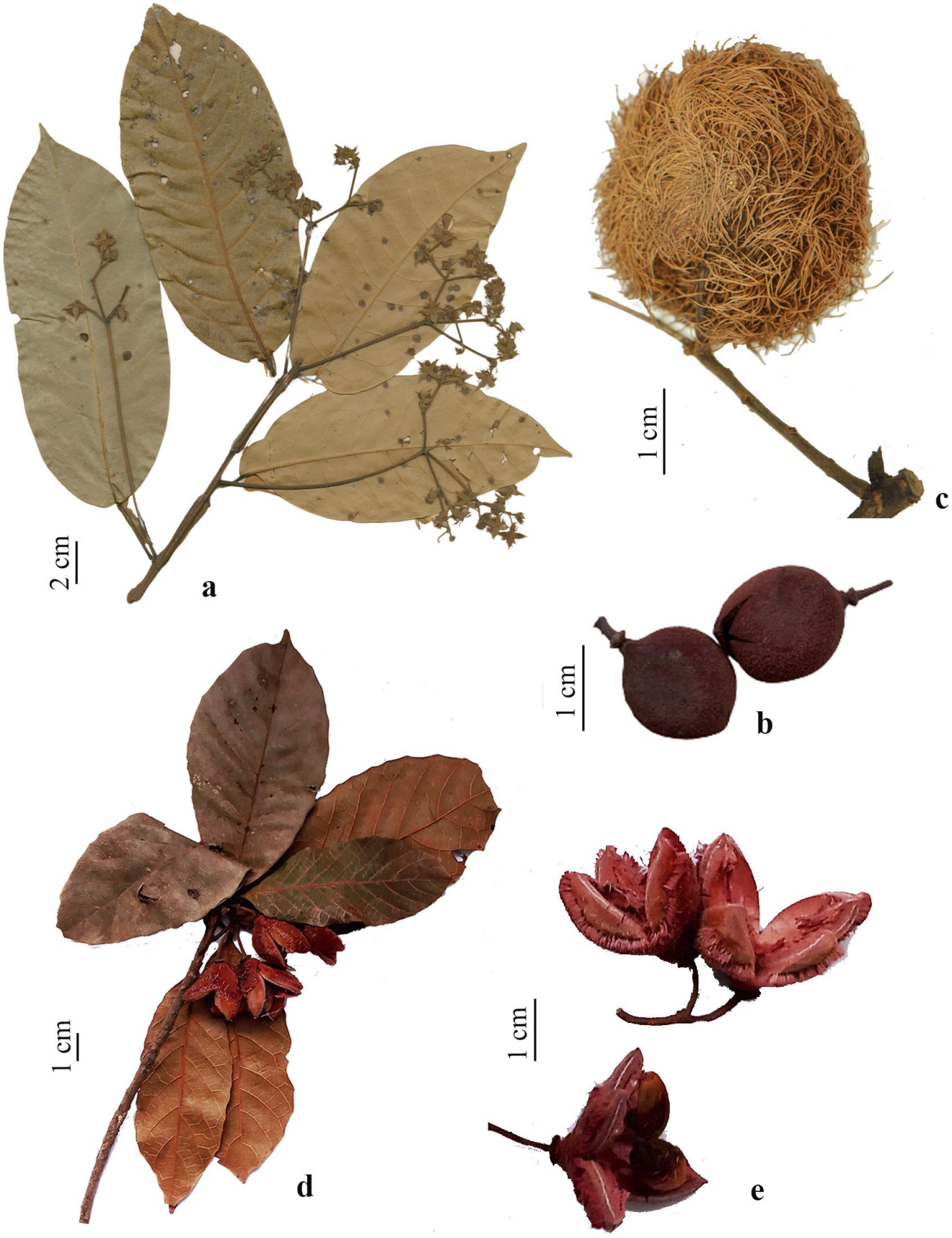
Tree, tall (fide Ducke 1660). Leaves alternate, distributed along the branches; leaf blade lanceolate, 6–15 × 3.5–8.5 cm, apex acute, base acute or cuneate, margin entire to slightly undulate, glabrous on the adaxial surface, glabrous to puberulous on the abaxial surface; venation craspedodromous, primary and secondary veins prominent on the abaxial surface, flat on the adaxial surface; tertiary veins percurrent. Flowers not seen. Fruit 2.1–2.5 × 1.8–2 cm, ellipsoid, pubescent, with 4 valves, covered by straight, puberulous bristles, 7–13 mm long. Seeds 1, ovoid, 10 × 5 mm, aril not seen.

Material examined: BRAZIL, Pará: Belém, Catú, mata de terra firme à beira do igapó, 24/XI/1944, fr., *A. Ducke* 1660 (IAN, MG, R, RB); *loc cit.*, 6/XII/1944, fr., *R.L. Fróes* 20784 (IAN).

Sloanea nitida occurs in French Guiana, Guyana, and Venezuela (Pennington; Wise, 2017). In Brazil, it occurs in the states of Amazonas and Pará (Sampaio, 2020). In the study area, it was found in terra firme forest. It was collected with fruits in November.

Sloanea nitida is easily distinguished from the other species of the studied area by the lanceolate leaf blades and the ovoid seeds.

Figure 2. a-b. *Sloanea floribunda* – a. flowering branch; b. fruit. c. *Sloanea grandiflora* – c. fruit. d-e. *Sloanea terniflora* – d. reproductive branch; e. fruit. (a. *Pires & Silva* 11905; b. *Pires & Silva* 10265; c. *Oliveira & Nascimento* 627; d-e. *Cruz* 1261).



6. *Sloanea porphyrocarpa* Ducke, Arq. Inst. Biol. Veg. 2: 167 (1935).

Tree, medium-sized (fide Ducke 2034). Leaves subopposite, concentrated at the apex of the branches; leaf blades obovate, 9–18.2 × 2.5–6 cm, apex acute, base cuneate, margin entire to undulate on the upper third of the blade, glabrous on both surfaces; venation craspedodromous, primary and secondary veins prominent on the abaxial surface, flat on the adaxial surface; tertiary veins percurrent. Flowers not seen. Fruit 2.5–3 × 2–2.5 cm, globose, pubescent, with 4 valves, covered by flexible bristles, puberulous, ca. 2 mm long. Seeds 1, ovoid, 14 × 6 mm wide, completely covered by the aril.

Material examined: BRAZIL, Pará: Belém, Bosque Municipal, mata de terra firme, 04/XII/1946, fr., *A. Ducke* 2034 (IAN, MG, R).

Sloanea porphyrocarpa is recorded from Bolivia, Peru, and Venezuela (Pennington; Wise, 2017). In Brazil, it occurs in the states of Acre, Amazonas, Maranhão and Pará (Sampaio, 2020). In the MRB, it was found in terra firme forest. It was collected with fruits in December. The species has affinities with *S. grandiflora*, which are discussed in the comments of the latter.

7. *Sloanea sinemariensis* Aubl., Hist. Pl. Guiane 1: 534, tab. 212 (1775).

Tree, 10 m tall. Leaves alternate, concentrated at the apex of the branches; leaf blades elliptic or obovate, 7.5–20.5 × 5.3–8.7 cm, apex obtuse or acute, base obtuse or rounded, margin undulate, glabrous on the adaxial surface except for the puberulous veins, puberulous on the abaxial surface; venation craspedodromous, primary and secondary veins prominent on the abaxial surface, flat on the adaxial surface; tertiary veins percurrent. Inflorescence axillary, ramiflorous. Sepals 5–7, lanceolate, apex acuminate, margin entire, pubescent on both sides, not covering the reproductive organs in the floral bud. Filaments 2–2.5 mm long, bristly; anthers 1–1.5 mm long, elliptical, velutinous; connective acute, less than 0.5 mm long, glabrous. Ovary ellipsoid, ca. 2 mm long, densely pubescent, sessile; style 4–6 mm long, straight or contorted, 4-parted at the apex, pubescent at the base, glabrous at the apex. Fruit 1–2 × 0.7–1.1 cm, ellipsoid, pubescent, with 3–5 valves, covered by straight bristles, 4–7 mm long. Seeds 1, ellipsoid, 9–11 × 3–4 mm, aril not seen.

Material examined: BRAZIL, Pará: Belém, 30/VIII/1950, fl., *J.M. Pires* 2637 (IAN); I.A.N., 13/I/1951, fr., *J.M. Pires* 3134 (IAN); Floresta do Utinga, 17/XII/1948, fl. & fr., *J.M. Pires* 1433 (IAN); Arredores de Belém, adjacências do I.A.N., 6/XII/1944, fr., *R.L. Fróes* 20781 (IAN).

Sloanea sinemariensis occurs in Bolivia, Colombia, French Guiana, Guyana, Peru, Suriname, and Venezuela (Pennington; Wise, 2017). This species is widely distributed throughout Brazil (Sampaio, 2020). It is commonly found in non-flooded soils such as in terra firme forests, slope forests and plateau forests in the Amazon region and in tableland forests in the state of Espírito Santo. In Central Brazil, it is registered in gallery forests. Specimens with flowers were collected from August to December and with fruits from December to January.

Sloanea sinemariensis can be confused with *S. terniflora*, from which it can be distinguished by being smaller (10 m tall vs. 19-30 m tall in *S. terniflora*), presenting leaves with glabrous adaxial surface - except for the puberulous veins - and puberulous abaxial surface (vs. leaves with glabrous surfaces on both sides except for the veins in *S. terniflora*), and fruit bristles measuring 4–7 mm (vs. 2 mm in *S. terniflora*).

8. *Sloanea terniflora* (DC.) Standl., Trop. Woods 79: 10 (1944). (Figures 2d-e)

Tree, 19–30 m tall. Leaves alternate or subopposite, distributed along the branches or concentrated at the apex of the branches; leaf blade elliptic, 8.5–14.2 × 3.3–6.4 cm, apex acute or obtuse, base obtuse or acute, margin undulate, glabrous on both sides except for the veins; venation craspedodromous, primary and secondary veins prominent on the abaxial surface, flat on the adaxial surface; tertiary veins percurrent. Flowers not seen. Fruit 1.2–2.5 × 0.8–2 cm, ellipsoid, pubescent, with 4 valves, covered by pubescent bristles, ca. 2 mm long. Seeds 1–2, ellipsoid, 10–12 × 6–7 mm, completely covered by the aril.

Material examined: BRAZIL, Pará: Belém, Reserva do Mocambo, fr., *E.D. Cruz* 1261 (IAN); *loc. cit.*, *E.D. Cruz* 1262 (IAN).

Sloanea terniflora occurs from Mexico to Southeastern Brazil (Sampaio, 2020). In Brazil, it is found along rivers, in terra firme forests and gallery forests.

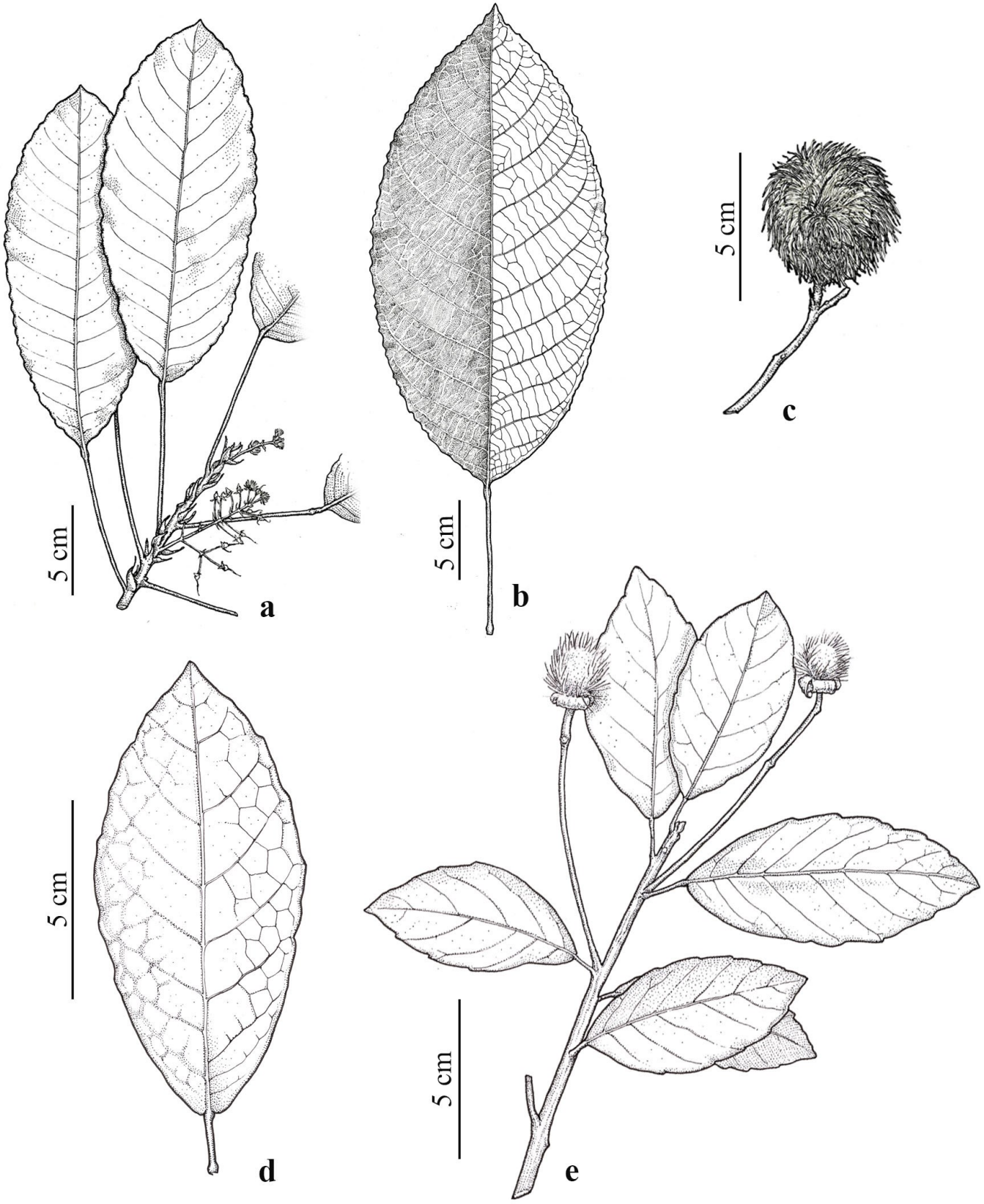
Similarities and differences with *S. sinemariensis* are presented in the discussion of the latter.

Conclusion

For the Metropolitan Region of Belém (MRB), state of Pará, eight species belonging to the genus *Sloanea* were recognized. The main attributes used for the taxonomic differentiation of these species included the analysis of venation, brochidodromous and craspedodromous, observation of the characteristics of tertiary veins, phyllotaxis and leaf morphology, as well as the morphological characteristics of the fruits. The predominant vegetation typologies in the study area included floodplain forest formations and terra firme forests.

With the results obtained, it can be affirmed that the MRB, despite undergoing increasing anthropic pressure over the years, constitutes a floristically important area for the phanerogamic flora of the region. This importance is demonstrated by the richness of species, among which some are rare, such as *Sloanea granulosa*, whose nomenclatural types (holotype and paratype) originate from Belém, recorded for the last time in Pará and perhaps in Brazil, over 70 years ago. Regarding the conservation status of the species, only *S. porphyrocarpa* is categorized as a species of Least Concern (LC), requiring further research efforts to expand the available knowledge (Amorim; Jordão; Gomes, 2023). This study expands knowledge about *Sloanea* within the local biodiversity, contributing to a better understanding of the genus's diversity.

Figure 3. a-c. *Sloanea grandiflora* – a. flowering branch; b. leaf blade; c. fruit. d-e. *Sloanea nitida* – d. leaf blade; e. reproductive branch. (a-c. *Silva* 2861; d-e. *Ducke* 1660).



Acknowledgements

The first author thanks MSc. Camilo Veríssimo for his help in the examination of the botanical material, the revision of the text, and the support throughout the project, and Milena Andrade for the preparation of the map. The authors thank the staff of the Museu Paraense Emílio Goeldi (MPEG) and of the Universidade Federal Rural da Amazônia (UFRA) for offering the graduate course and the infrastructure that made it possible to carry out this study; the directors and curators of the herbaria for their help and for providing work space, especially the staff of the MG and IAN.

Funding

The CNPq (131777/2014-9) for granting the master's scholarship to the first author and for the productivity grants provided to ASBG (314271/2020-1 – CNPq). This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.

Authorship Contributions

Conceptualization: LAT, ASBG, PGD. Data curation: LAT. Formal Analysis: LAT. Funding acquisition: LAT, DS, ASBG, PGD. Investigation: LAT. Methodology: LAT. Project administration: LAT, DS, ASBG, PGD. Resources: LAT, DS, ASBG, PGD. Software: LAT. Supervision: LAT, DS, ASBG, PGD. Validation: LAT, DS, ASBG, PGD. Visualization: LAT, DS, ASBG, PGD. Writing – original draft: LAT. Writing – review & editing: LAT, DS, ASBG, PGD.

Conflict of Interest

The authors declare that there are no conflicts of interest to report.

Data Availability

The complete set of data analyzed during the current study are presented in the body of the manuscript.

Ethical Compliance

Not applicable.

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How to cite this article
Como citar este artigo

(ABNT)
TEIXEIRA, L. A.; SAMPAIO, D.; GIL, A. S. B.; DELPRETE, P. G. Taxonomic study of *Sloanea* L. (Elaeocarpaceae) in the Metropolitan Region of Belém, Pará, Brazilian Amazon. **Paubrasilia**, Porto Seguro, v. 7, e136, 2024. DOI: 10.33447/paubrasilia.2024.e0136.

(Vancouver)
Teixeira LA, Sampaio D, Gil ASB, Delprete PG. Taxonomic study of *Sloanea* L. (Elaeocarpaceae) in the Metropolitan Region of Belém, Pará, Brazilian Amazon. Paubrasilia 2024;7:e136. doi:10.33447/paubrasilia.2024.e0136.