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Flora of Espírito Santo, Brazil

Flora of Rio Preto National Forest: Salicaceae

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Abstract

Salicaceae (Malpighiales) has a pantropical distribution, with 58 genera and ca. 1,200 species, and the Neotropical region is its center of diversity. In Brazil, 20 genera and 104 species can be found, of which 35 species are endemic. Holding almost half of Salicaceae diversity of the Atlantic Forest domain, Espírito Santo state has registered 23 species and four genera. Facing a large number of unidentified vouchers from the north of the state and challenging diagnostic characters for specific delimitation, this work aims to provide a taxonomic survey of Salicaceae of the Rio Preto National Forest. To do so, monthly field expeditions were carried out from January/2018 to March/2020. Salicaceae of Rio Preto National Forest is represented by four genera and nine species, where the genus *Xylosma* (*X. glaberrima*) and the species *Banara serrata* are new records to Espírito Santo state. *Casearia* is the richest genus with six species. Characters such as thorns, stipules, leaf punctations, type of venation and leaf margin, position and morphology of the leaf glands, position and morphology (sessile or pedunculate) of the inflorescences, number of floral whorls and position of the disc lobes are the most important characters for specific recognition.

Key words: Atlantic Forest, Espírito Santo state, Malpighiales, southeastern Brazil, taxonomy.

Resumo

Salicaceae (Malpighiales) tem distribuição pantropical, com 58 gêneros e ca. 1.200 espécies, sendo a região Neotropical o centro de diversidade. No Brasil, são registrados 20 gêneros e 104 espécies, sendo 35 espécies endêmicas. Com quase metade da diversidade de Salicaceae do domínio da Mata Atlântica, no estado do Espírito Santo está por 23 espécies e quatro gêneros. Diante de um grande número de vouchers não identificados do norte do estado e de caracteres diagnósticos desafiadores para delimitações específicas, este trabalho tem como objetivo fornecer um levantamento taxonômico de Salicaceae da Floresta Nacional do Rio Preto. Foram realizadas expedições de campo mensais no período de janeiro/2018 a março/2020. Salicaceae na Floresta Nacional do Rio Preto está representada por quatro gêneros e nove espécies, sendo o gênero *Xylosma* (*X. glaberrima*) e a espécie *Banara serrata* novos registros para o estado do Espírito Santo. *Casearia* é o gênero mais rico com seis espécies. Caracteres como espinhos, estípulas, pontuações foliares, tipo de venação e margem foliar, posição e morfologia das glândulas foliares, posição e morfologia (séssil ou pedunculada) das inflorescências, número de verticilos florais e posição dos lobos do disco são os caracteres mais importantes para o reconhecimento específico.

Palavras-chave: Mata Atlântica, Espírito Santo, Malpighiales, sudeste brasileiro, taxonomia.

Introduction

Salicaceae is inserted in Malpighiales and is subdivided into three subfamilies (Samydoideae, Scyphostegioideae and Salicoideae) with about 1,000 species and 55 genera distributed pantropically, whose center of diversity is in the Neotropics (Sleumer 1980; APG IV 2016). The family has nine tribes, of which only Bembicieae and

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Scolopieae (Salicoideae) have no representatives in the Neotropical region, while Flacourtieae (14 genera) is the most representative (Sleumer 1980; Chase *et al.* 2002). Brazil is home to about 108 documented species, of which 35 are endemic, and 20 genera, with *Macrothumia* being endemic to the country (BFG 2018). The phytogeographic domains of the Amazon and Atlantic Forest are the most diversified, with 62 and 47 species, respectively (BFG 2018).

The state of Espírito Santo is fully inserted in the Atlantic Forest domain, and has registered four genera (*Abatia*, *Banara*, *Casearia* and *Macrothumia*) and 47 species of Salicaceae, of which 15 are endemic to Brazil, including *Banara trinitatis* Sleumer (1980: 22) and *Casearia espiritosantensis* Marquete & Mansano (2010: 20), which have until now confirmed occurrence only for Espírito Santo (BFG 2018).

Due to the inclusion of most species of Flacourtiaceae in Salicaceae, the taxonomy of this group is quite complex, especially considering the fact that Flacourtiaceae was a family where taxa with uncertain relationships and identities were inserted (Chase *et al.* 2002). However, Chase *et al.* (2002) separated the species of Flacourtiaceae into two groups, Achariaceae and Lacistemataceae, considered the "cyanogenic Flacourtiaceae", and a larger group, the "non-cyanogenic Flacourtiaceae", which was transferred to Salicaceae.

Most of the taxonomic studies carried out for Salicaceae have taken place in the Southeast region of Brazil, of which we highlight those carried out in the Atlantic Forest: Guimarães (1971), monographed 17 species of Flacourtiaceae for Flora da Guanabara (= Rio de Janeiro), including those that are currently circumscribed in Achariaceae and Lacistamataceae; Marquete & Vaz (2007) carried out a taxonomic study of *Casearia* for Rio de Janeiro, where they treated 12 species, and Torres & Ramos (2007), cataloged seven genera and 23 species for Flora of São Paulo, in vegetation in the Cerrado and Atlantic Forest domains.

This work is part of the project "Rediscovering endangered species in protected areas of Atlantic Forest: bases for management, conservation and access to information" and aimed to carry out a taxonomic treatment of Salicaceae species occurring in the Rio Preto National Forest, municipality of Conceição da Barra, contributing to and updating the knowledge of the geographic distribution of species and diversity of the flora of Espírito Santo.

Material and Methods

Area of study

Rio Preto National Forest (RPNF) is a federal conservation unit belongs to the municipality of Conceição da Barra, northern Espírito Santo state (Fig. 1). RPNF is crossed by many water bodies, especially the Rio Angelim and the homonymous Rio Preto, and is fully inserted in the Atlantic Forest domain with approximately 2,830 ha (IBAMA 1999). According to IBGE (2012) and Garbin *et al.* (2017), the vegetation of the RPNF is classified mainly as Dense Ombrophilous Forest of low altitudes (lowlands), occupying the formations of Pleistocene coastal shelves of the Barreiras Group. It is noteworthy that within the perimeter of RPNF two phytophysiognomies are found, the high forest which is composed of large trees with large trunk diameters and a high canopy, growing in clay soils, and an enigmatic type of vegetation locally called *mussununga*, which comprises large open areas of sandy soils within the dense, low-altitude ombrophilous forest, where the herbaceous and shrub strata, and even small trees, predominate. Historically, RPNF has undergone vegetation suppression by grazing, logging, human fires, and monoculture cultivation such as eucalyptus. Despite comprising continuous or even well-linked remnants, the vegetation of RPNF presents different levels of environmental recovery depending on local past human impacts.

Field expeditions and laboratory studies

Field expeditions were carried out monthly from January/2018 to March/2020 and samples were dried according to the usual fieldwork and herborization procedures (Bridson & Forman 1998). Vouchers were incorporated into the VIES collection (Thiers, continuously updated) with duplicates distributed to other herbaria (especially RB, SAMES). In addition, specimens from CVRD, MBML, SAMES, and VIES were analyzed. For identification, the specialized literature (*e.g.*, Sleumer 1980; Torres & Ramos 2007; Marquete & Mansano 2016; Nepomuceno & Alves 2020) and protologs were consulted. Morphological terminology follows Harris & Harris (2001) and for authors' nomenclature, IPNI (2021).

Results and Discussion

Salicaceae in the RPNF is represented by four genera and nine species: *Banara serrata*

(Vellozo 1829: 232) Warburg (1893: 3), *Casearia aculeata* Jacquin (1760), *C. arborea* (Richard 1792: 109) Urban (1910: 4), *C. commersoniana* Cambessèdes (1830: 2), *C. javitensis* Kunth (1823: 5), *C. souzae* Marquete & Mansano (2013: 51), *C. sylvestris* Swartz (1798: 2), *Macrothumia kuhlmannii* (Sleumer 1950: 248) Alford (2006: 16) and *Xylosma glaberrima* Sleumer (1980: 22). The latter and *Banara serrata* constitute first records for Espírito Santo state. Among the species occurring in the study area, only *X. glaberrima* is evaluated for its conservation, being classified as Near Threatened (NT).

Banara serrata, *Casearia commersoniana*, *C. souzae*, *Macrothumia kuhlmannii* and *Xylosma glaberrima* are endemic to Brazil (BFG 2018). Despite the RPNF being severely impacted by anthropic pressures, more than half (55.5%) of the Salicaceae species occurring in the RPNF are endemic to Brazil, including *M. kuhlmannii* and *X. glaberrima*, which are found only in the Atlantic Forest domain. Among the species of Salicaceae endemic to Brazil that are recorded in the state of Espírito Santo, 33.3% occur in the RPNF. In addition, *B. serrata* presents an Amazonian-Atlantic geographical disjunction (BFG 2018), while *Casearia souzae* is also registered in areas of the Caatinga domain (Nepomuceno & Alves 2018), which help elucidate a better understanding of the evolutionary processes of Brazilian vegetation.

Casearia commersoniana, *C. javitensis*, *C. souzae* and *C. sylvestris* were most frequently found, while the rarest were *B. serrata*, *C. aculeata*, *C. arborea*, *M. kuhlmannii* and *X. glaberrima*. *Casearia* species are often heliophytes or semi-cyophytes, commonly found along the edges of remnants. *Banara*, *Macrothumia* and *Xylosma* species are cyophytes and occur associated with water bodies inside forest remnants.

The most important characters for distinguishing species of the RPNF are the following: thorns, stipules, leaf punctations, apicules, type of venation and leaf margin, position and morphology of the leaf glands, position and morphology of the inflorescences, floral whorls and position of the disc lobes.

Taxonomic treatment

Salicaceae[1] Mirb., Elem. Physiol. Veg. Bot. 2: 905. 1815.

[1] Description of the family and species based on specimens occurring in the Rio Preto National Forest.

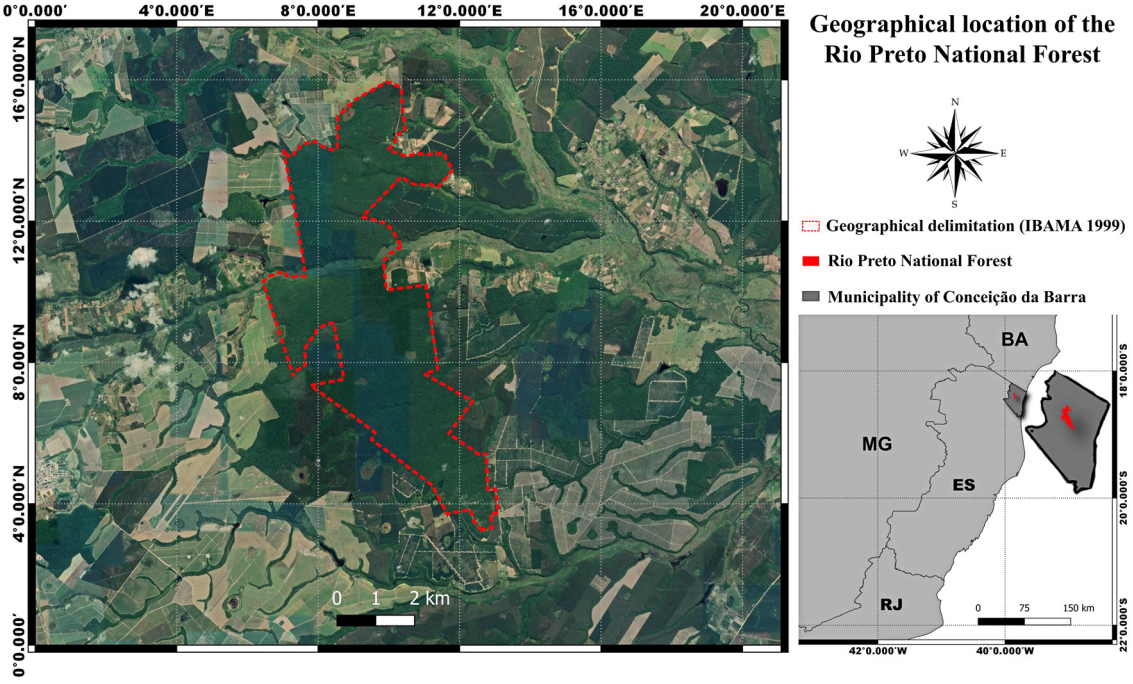

Figure 1 – Geographical location of the Rio Preto National Forest.

Trees, unarmed or armed with thorns. Stipules absent or present, when the latter, lanceolate to linear-lanceolate, caducous. Leaves alternate, petiolate, simple, leaf blade elliptical, wide-elliptical to elliptical-lanceolate, apex acute, cuspitate to acuminate, attenuated, base cuneate to rounded, chartaceous, with translucent punctations and lines present or absent, margin entire or usually glandular-serrated. Inflorescences umbels, fascicles or panicles, terminal or axillary; flowers bisexual or unisexual, actinomorphic, monochlamydeous or dichlamydeous; sepals free, aestivation valvate; petals isomerous of the sepals, when present; stamens 8-numerous, filaments free, anther dehiscence rimose; lobes of the nectariferous disc, when present, alternate between the stamens or positioned between the ovary and the stamens; ovary superior, unilocular, placentation parietal, bi-pluri-ovulate. Fruit capsules or berries. Seeds arillate or not.

Key of Salicaceae of Rio Preto National Forest, Espírito Santo, Brazil

1. Plants armed with thorns.
   2. Plants dioecious, armed with simple thorns on the branches and branched on the trunk, stipules absent, translucent punctations and traces absent in the leaf blade ..... 9. *Xylosma glaberrima*
   2'. Plants hermaphordites, armed only on branches with simple thorns, stipules present, translucent punctations and lines present in the leaf blade.....2. *Casearia aculeata*

1'. Plants unarmed.
   3. Inflorescences terminal to subterminal, flowers dichlamydeous and homochlamydeous.
      4. Leaves 5-nerved, glands-2, prominent, sessile, at the base of the leaf blade, margin entire .. .. 8. *Macrothumia kuhlmannii*
      4'. Pseudotrinverved leaves, glands-2, superficial, sessile, in the lower left third of the leaf blade, margin glandular-serrated .....1. *Banara serrata*
   3'. Inflorescences axillary, flowers monochlamydeous.
      5. Inflorescences pedunculate.....3. *Casearia arborea*
      5'. Inflorescences sessile.
         6. Translucent punctations and lines absent on leaf blade; disc lobes positioned between the stamens and the ovary.
            7. Leaf apex acute to short-acuminate; flowers with tomentose sepals; stigma pilose .....4. *Casearia commersoniana*
            7'. Leaf apex long-acuminate to caudate; sepals pilose; stigma glabrous..... ..... 5. *Casearia javitensis*
         6'. Translucent punctations and lines present on leaf blade; disc lobes alternating between the stamens.
            8. Leaf apicule present .....6. *Casearia souzae*
            8'. Leaf apicule absent.....7. *Casearia sylvestris*

1. *Banara serrata* (Vell.) Warb., Die Natürlichen Pflanzenfamilien 3(6a): 32. 1893. Fig. 2a-b

Trees, unarmed, 4–6 m tall, hermaphordites. Branches pubescent, trichomes brownish. Stipules 2–3 × 1–1.5 mm, lanceolate, pubescent. Leaf blades 4–8 × 3–5 cm, elliptical, translucent punctations and traces absent, chartaceous, glabrous on both surfaces, base asymmetrical, obtuse, glands-2, superficial, sessile, in the lower left third of the leaf blade, apex acuminate, apicule absent, margin glandular-serrated, pseudotrinerved, secondary veins 5–7 pairs; petiole 4–8 mm long, pubescent. Inflorescences 4–8 cm long, terminal to subterminal, racemose, peduncle 2–3 cm long, pubescent, bracts triangular. Flowers bisexual, dichlamydeous and homochlamydeous, pedicel 3–6 mm long, pubescent; calyx 3(–4)-merous, sepals 6–8 × 3–4 mm, elliptical, pubescent; petals isomeric to sepals; stamens 20-numerous, glabrous, anthers globose, nectariferous disc absent; ovary 3–5 × 2–3 mm, ovoid, pubescent, style 3–5 mm long, entire, glabrous, caducous, stigma glabrous. Berries and seeds not seen.

Material examined: trilha do Paliteiro, 7.II.2019, *A. Nepomuceno et al. 659* (VIES).

Additional material: BRAZIL. ESPÍRITO SANTO:

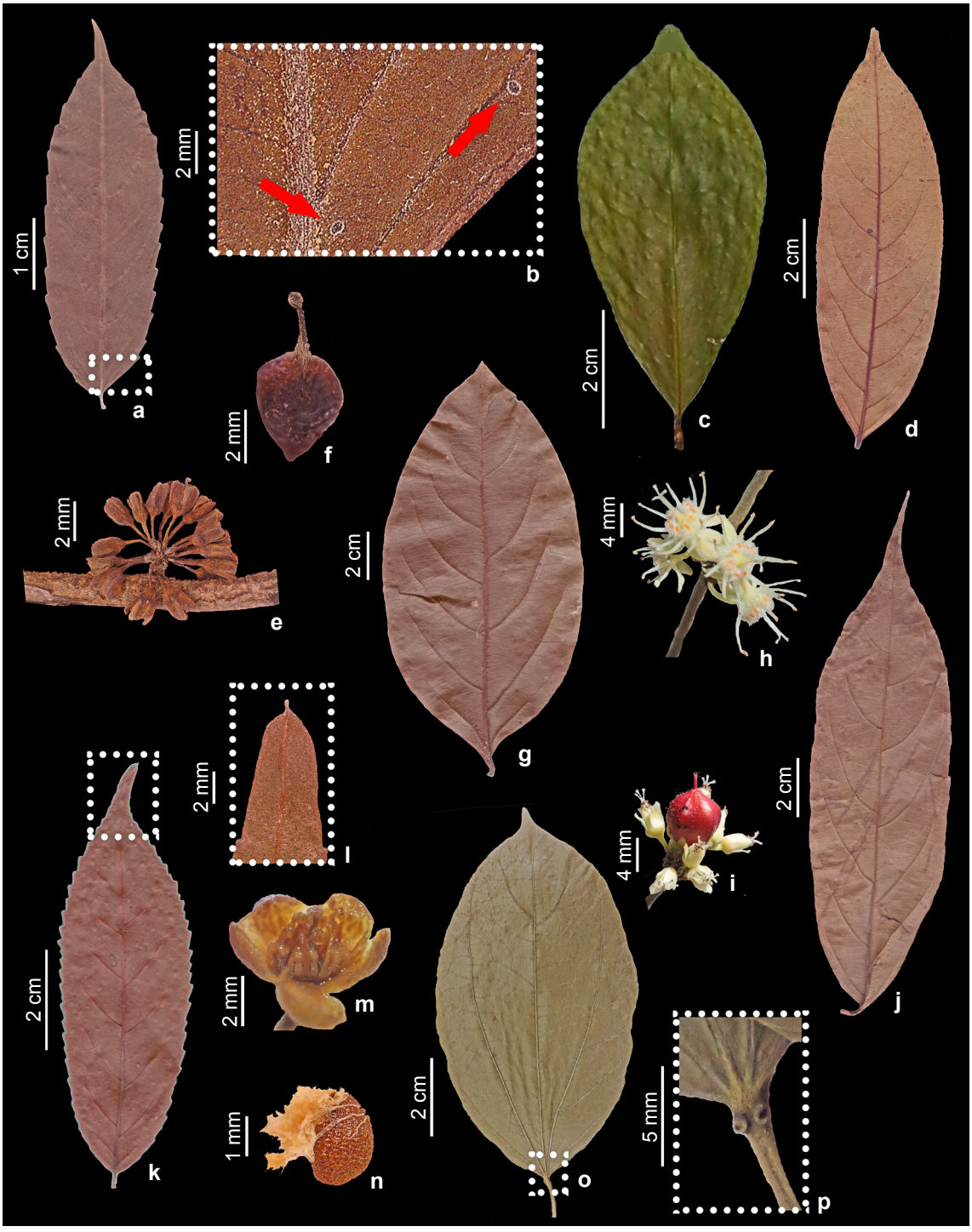

Figure 2 – a-p. Morphological characters of Salicaceae species occurring in Rio Preto National Forest. a-b. *Banara serrata* – a. leaf blade adaxial view; b. glands (red arrows); c. *Casearia aculeata* – leaf blade; d-f. *Casearia arborea* – d. leaf blade; e. inflorescence; f. gynoecium; g-i. *Casearia commersoniana* – g. leaf blade; h. inflorescence (*in vivo*); i. capsule and flowers (*in vivo*); j. *Casearia javitensis* – leaf blade; k-n. *Casearia souzae* – k. leaf blade; l. detail of apex with apicule; m. flower; n. seed with aril; o-p. *Macrothumia kuhlmannii* – o. leaf blade; p. detail showing two glands at the leaf base.

Santa Teresa, Parque Museu de Biologia Mello Leitão, I.1989, fl., *W. Boone 1287* (MBML).

Banara serrata is endemic to Brazil, occurring disjunctly in the domains of the Amazon and Atlantic Forest. According to the data presented in BFG (2018), this is a new record for Espírito Santo, although in other online databases there have been materials for some time that refer to the occurrence of the species in the state. Despite this, the species does not have an assessment for its conservation status. *Banara serrata* is similar to *B. umbraticola* Arechavaleta (1899: 2) due to vegetative and most reproductive morphological characters, however, they can be differentiated by *B. serrata* having yellow flowers, while *B. umbraticola* has white flowers. In addition, *B. umbraticola* is registered only to Argentina. In the study area, few individuals of the species were found, occurring in shaded areas in the interior of forest fragments.

2. *Casearia aculeata* Jacq., Enum. Syst. Pl.: 21. 1760. Fig. 2c

Trees, armed, 2–5 m tall, hermaphordites. Branches tomentose, trichomes brownish. Thorns 2–5 cm long, simple, cylindrical, glabrescent. Stipules 1.5–2 × 0.5–0.8 mm, lanceolate, tomentose. Leaf blades 4–6 × 3–5 cm, elliptical, translucent punctations and traces present, chartaceous, glabrescent on both surfaces, base symmetrical, attenuated, glands absent, apex acute to cuspitate, apicule absent, margin glandular-serrated, secondary veins 4–7 pairs; petiole 2–4 mm long, glabrescent. Inflorescences 5–10 mm diam., fasciculate, sessile; bracts ovate to elliptical. Flowers bisexual, monochlamydeous, pedicel 2–4 mm long, tomentose; sepals 3–4 × 1.5–2 mm, obovate, glabrous; stamens 8, glabrous, anthers obloid, disc lobes oblong-clavate, alternating between the stamens; ovary 2–4 × 1.5–3 mm, ovoid, villous, style 3–4 mm long, whole, villous at the insertion of the ovary and glabrescent towards the apex, caducous, stigma glabrous. Capsules 8–10 × 4–6 mm, elliptical to subglobose, sparse-villous, vinaceous. Seeds not seen.

Material examined: 11.IV.2016, fl. and fr., *Grupo de Coletores do Núcleo Juçara 221* (RB).

Casearia aculeata has a wide geographical distribution in the Neotropics. In Brazil it has registered occurrence for the Amazon, Cerrado and Atlantic Forest domains (BFG 2018). Like the previous species, this species also does not have its conservation status evaluated. *Casearia aculeata* being morphologically similar to *C. oblongifolia* Cambessèdes (1830: 2), but can be distinguished by its leaves with acute apex (*vs.* subcaudate to acuminate in *C. oblongifolia*). In the study area, few individuals of the species were found, in partially shaded areas, along the edge of forest fragments.

3. *Casearia arborea* (Rich.) Urb., Symb. Antill. 4(3): 421. 1910. Fig. 2d-f

Trees, unarmed, 4–10 m tall, hermaphordites. Branches puberulous, trichomes brownish. Stipules 4–6 × 0.5–1 mm, lanceolate, velutinous. Leaf blades 5–10 × 2–4 cm, elliptical, translucent punctations and traces present, chartaceous, glabrescent on the adaxial surface and pubescent to tomentose on the abaxial surface, base symmetrical, cuneate, glands absent, apex acute to acuminate, apicule absent, margin glandular-serrate, secondary ribs 5–7 pairs; petiole 3–5 mm long, glabrescent. Inflorescences 5–8 mm diam., axillary, umbelliform, peduncle 2–5 mm long, tomentose; bracts lanceolate to wide-lanceolate. Flowers bisexual, monochlamydeous, pedicel 2–4 mm long, pubescent; sepals 3–4 × 2–2.3 mm, ovate to elliptical, puberulous; stamens 10, glabrescent, anthers ovoid, disc lobes oblong-clavate, alternating between the stamens; ovary 3–3.2 × 1.5–2 mm, obloid-ovoid, glabrous, style 2–3 mm long, entire, pilose to glabrescent towards the apex, caducous, stigma hirsute. Capsules 4–7 × 3–5 mm, ovoid, glabrous, vinaceous. Seeds 2–2.5 × 1–1.5 mm, obloid, aril yellowish, partially covering the seed.

Material examined: trilha do Paliteiro, 7.II.2019, fl. and fr., *A. Nepomuceno et al. 658* (VIES).

Casearia arborea has a wide geographical distribution in the Neotropics. In Brazil it has been registered to occur in the Amazon, Cerrado and Atlantic Forest domains (BFG 2018). Like the previous species, this species also does not have its conservation status evaluated. *Casearia arborea* belongs to *Casearia* sect. *Casearia*, and the informal group Arboreae, and has a very similar morphology to *C. grandiflora* Cambessèdes (1830: 2), being differentiated by tenuous morphological characters, such as peduncle and pedicel length (*Casearia arborea* with peduncle and pedicel ≥ 2 mm and *C. grandiflora* with peduncle and pedicel ≤ 2 mm), according to Sleumer (1980). In the study area, few individuals of the species were found, in partially shaded areas, along the edge of forest fragments.

4. *Casearia commersoniana* Cambess., *Fl. bras.* Merid. 2(16): 235. 1829 [1830]. Fig. 2g-i

Trees, unarmed, 3–8 m tall, hermaphordites. Branches glabrescent to lightly pilose, trichomes brownish. Stipules 2–4 × 1–1.3 mm, linear-lanceolate, tomentose. Leaf blades 8–18 × 3–7 cm, elliptical to ovate or lanceolate, translucent punctation and traces absent, chartaceous, glabrescent on the adaxial surface and slightly hirsute on the adaxial surface, base symmetrical, obtuse, glands absent, apex acute to short-acuminate, apicule absent, margin glandular-serrated, secondary veins 5–7 pairs; petiole 3–7 mm long, glabrous. Inflorescences 9–12 mm diam., axillary, fasciculate, sessile; bracts ovate. Flowers bisexual, monochlamydeous, pedicel 6–10 mm long, tomentose; sepals 2–4 × 2–3 mm, ovate to oblong, tomentose; stamens-10, glabrous, anthers obloid, disc lobes oblong-clavate, positioned between the stamens and the ovary; ovary 3–4 × 2–3 mm, ovoid to subglobose, pilose, style 3–4.5 mm long, tripartite at the apex, pilose, sometimes persistent in the capsule, stigma pilose. Capsules 7–12 × 5–9 mm, ovoid to sub-ovoid, pilose, vinaceous. Seeds 2–4 × 3–4 mm, globoid to obovoid, aril white, partially covering the seed.

Material examined: 14.VIII.1995, fl., *A. Luzia* (VIC 17967, RB 493701); 26.X.2013, fl., *Grupo de Coletores do Núcleo Juçara 05* (RB); 10.VII.2014, fl., *Grupo de Coletores do Núcleo Juçara 105* (RB); 7.VIII.2014, fr., *Grupo de Coletores do Núcleo Juçara 112* (RB); 18.IX.2014, fr., *Grupo de Coletores do Núcleo Juçara 130* (RB); trilha da Lagoa Seca, 28.III.2019, fl., *A. Nepomuceno et al. 771* (VIES); trilha do Canastra, 21.II.2019, *R. Nichio-Amaral et al. 602* (VIES); trilha da Sede Abandonada, 30.IV.2019, fl., *J. Gurtler et al. 664* (VIES); 4.VII.2019, *B.S. Mendes et al. 222* (VIES); 17.X.2019, fl. and fr., *R. Nichio-Amaral et al. 974* (VIES).

Casearia commersoniana has endemic to Brazil, occurring in the Amazon, Caatinga, Cerrado and Atlantic Forest domains (BFG 2018). Like the previous species, this species also does not have its conservation status evaluated. *Casearia commersoniana* belongs to *Casearia* sect. *Piparea*, being similar morphologically to *C. javitensis* and *C. spruceana* Bentham ex Eichler (1871: 13), according to Sleumer (1980). However, this species can be distinguished from the former by flowers with tomentose sepals and 10 stamens (*vs.* flowers with pilose sepals and 15–17 stamens) and from the latter by presenting ovate to oblong sepals and 10 stamens (*vs.* oval-lanceolate sepals and 20 stamens). In the study area, several individuals of the species were found, in partially shaded areas, along the edge and in the interior of forest fragments.

5. *Casearia javitensis* Kunth, Nov. Gen. Sp. 5: 366. 1821. Fig. 2j

Trees, unarmed, 4–9 m tall, hermaphordites. Branches glabrous to puberulous, trichomes brownish. Stipules 2–5 × 0.5–1 mm, triangular, pilose. Leaf blades 12–18 × 5–7 cm, elliptical to lanceolate, translucent punctation and traces absent, chartaceous, glabrous on both surfaces, base symmetrical, cuneate to rounded, glands absent, apex long-acuminate to caudate, apicule absent, margin glandular-serrulated, secondary veins 5–7 pairs; petiole 7–13 mm long, puberulous. Inflorescences 10–20 mm diam., axillary, fasciculate, sessile; bracts ovate. Flowers bisexual, monochlamydeous, pedicel 6–10 mm long, pilose; sepals 3–4 × 2–3 mm, oblong, pilose; stamens 15–17, glabrous, anthers obloid, disc lobes oblong-clavate, positioned between the stamens and the ovary; ovary 2.5–5 × 2.5–3 mm, ovoid to subglobose, densely pilose, style 3–5 mm long, tripartite at the apex, sparse-pilose, sometimes persistent in the capsule, stigma glabrous. Capsules 10–13 × 6–10 mm, obloid to ellipsoid, pilose, vinaceous. Seeds 2–3 × 2–4 mm, ovoid to obloid, aril partially covering the seed.

Material examined: 15.VIII.1995, *A. Luiza* (VIC 18122); trilha da Lagoa Seca, 29.VIII.2012, fl. and fr., *T.B. Flores & G.O. Romão 1283* (MBML); 2.IV.2018, fl., *T. Souza et al. 93* (VIES); 28.III.2019, *J. Gurtler et al. 645* (VIES); 28.III.2019, fl., *A. Nepomuceno et al. 781* (VIES); trilha do Paliteiro, 20.II.2019, fl., *A. Nepomuceno et al. 715* (VIES).

Casearia javitensis has a wide distribution, from southern Mexico to Brazil, where it occurs in the Amazon, Caatinga, Cerrado and Atlantic Forest domains (BFG 2018). Like the previous species, this species also does not have its conservation status evaluated. *Casearia javitensis* also belongs to *Casearia* sect. *Piparea*, is morphologically similar to *C. commersoniana*, and can be distinguished based on the comments mentioned in the previous species. In the study area, several individuals of the species were found, in partially shaded areas, along the edge and in the interior of forest fragments.

6. *Casearia souzae* R. Marquete & Mansano, J. Syst. Evol. 51(2): 228. 2013. Fig. 2k-n

Trees, unarmed, 3–5 m tall, hermaphordites. Branches pubescent, trichomes brownish.

Stipules 2–4 × 0.5–1 mm, triangular, pubescent. Leaf blades 5–8 × 1.5–3 cm, elliptical to slightly oblong, translucent punctation and traces present, chartaceous, glabrous on both surfaces, base symmetrical, obtuse, glands absent, apex acute, apiculate, margin glandular-serrated, secondary veins 6–10 pairs; petiole 4–5 mm long, glabrous. Inflorescences 8–12 mm diam., axillary, umbelliform, sessile; bracts ovate. Flowers bisexual, monochlamydeous, pedicel 3–5 mm long, pubescent; sepals 3–4 × 2–3 mm, obovate, pubescent; stamens-10, glabrous, anthers oblong, disc lobes clavate, alternating between stamens; ovary 3–5 × 2–2.5 mm, ovoid, pubescent, style 1.5–2 mm long, whole, glabrous, caducous, stigma hirsute. Capsules 4–7 × 2.5–4 mm, ovoid, glabrous, brown. Seeds 1.5–2 × 1–1.2 mm, obloid, aril white, partially covering the seed.
Material examined: trilha do Paliteiro, 7.II.2019, fr., *A. Nepomuceno et al. 657* (VIES); 20.II.2019, fl., *A. Nepomuceno et al. 721* (VIES); 27.III.2019, fl. and fr., *R. Nicho-Amaral et al. 676* (VIES); trilha da Sede Abandonada, 23.V.2019, fl. and fr., *V.S. Miranda et al. 457* (VIES).

Casearia souzae has a endemic to Brazil, occurring in the Caatinga and Atlantic Forest domains (Nepomuceno & Alves 2018). Despite this, the species does not have an assessment for its conservation status. *Casearia souzae* belongs to *Casearia* sect. *Casearia*, and the informal group Arboreae and, according to Sleumer (1980), is morphologically similar to *C. ulmifolia* Vahl ex Ventenat (1808). It can be distinguished by presenting an apiculate leaf apex (*vs.* leaf apex devoid of apiculum). In the study area, several individuals of the species were found, in partially shaded areas, along the edge and in the interior of forest fragments.

7. *Casearia sylvestris* Sw., Fl. Ind. Occid. 2:752. 1798. Fig. 3a-b

Trees, unarmed, ca. 4 m tall, hermaphordites. Branches puberulous, trichomes brownish. Stipules 1–4 × 1–1.2 mm, triangular, puberulous. Leaf blades 2–13 × 1.5–5 cm, elliptical to ovate, translucent punctation and traces present, chartaceous, glabrous on both surfaces, base symmetrical, cuneate, glands absent, apex acute to acuminate, apicule absent, margin glandular-serrated, secondary veins 9–11 pairs; petiole 2–5 mm long, puberulous. Inflorescences 9–15 mm diam., axillary, fasciculate, sessile; bracts ovate. Flowers bisexual, monochlamydeous, pedicel 3–4 mm long, glabrous; sepals 1–1.5 × 0.8–1 mm, ovate, pilose; stamens-10, pilose, anthers globose, disc lobes clavate, alternating between stamens; ovary 2–3 × 1.5–2 mm, ovoid, glabrescent, style 2–2.5 mm long, apex trifid, glabrous, sometimes persistent, stigma glabrescent. Capsules 3–5 × 3–4 mm, globose, glabrous, dark brown. Seeds 1.8–3 × 1.5–2 mm, obloid, glabrous, aril orange, partially covering the seed.
Material examined: trilha da Suzano, 29.VIII.2012, fl. and fr., *T.B. Flores & G.O. Romão 1270* (VIES).

Casearia sylvestris has a wide distribution from southern Mexico, Central and South America, where in Brazil, it occurs in all phytogeographic domains (BFG 2018). Like the previous species, this species also does not have its conservation status evaluated. *Casearia sylvestris* belongs to *Casearia* sect. *Craterea* and is morphologically similar to *Casearia obliqua* Cambessèdes (1830: 2), being differentiated, according to Sleumer (1980), by presenting penninerved leaves (*vs.* 3-nerved leaves at the base). In the study area, several individuals of the species were found, in partially shaded areas, along the edge and in the interior of forest fragments.

8. *Macrothumia kuhlmannii* (Sleumer) M.H.Alford., Novon 16(3): 296. 2006. Fig. 2o-p

Trees, unarmed, ca. 7 m tall, hermaphordites. Branches glabrous, trichomes brownish. Stipules 3–4 × 1–2 mm, ovate, glabrous. Leaf blades 7–10 × 4–5 cm, elliptical to oval, translucent punctation and traces absent, chartaceous to subcoriaceous, glabrous on both surfaces, base symmetrical, attenuated to rounded, glands-2, prominent, sessile, concave, glabrous, at the base of the leaf blade, apex acute to acuminate, apicule absent, margin entire, 5-nerved, secondary veins 10–15 pairs; petiole 15–30 mm long, pubescent. Inflorescences 8–15 mm long, terminal to subterminal, racemose, peduncle 1–1.5 cm long, tomentose; bracts triangular. Flowers bisexual, dichlamydeous and homochlamydeous, pedicel 5–15 mm long, tomentose; calyx 3(–4)-merous, sepals 8–10 × 3–5 mm, elliptical, tomentose; petals isomeric to sepals; stamens-20, glabrous, anthers globular, nectariferous disc absent; ovary 3–6 × 2–4 mm, ovoid, tomentose, style 2–4 mm long, entire, tomentose, caducous, stigma glabrescent. Berries and seeds not seen.
Material examined: 14.VIII.1995, *A. Luiza* (VIC 17966).

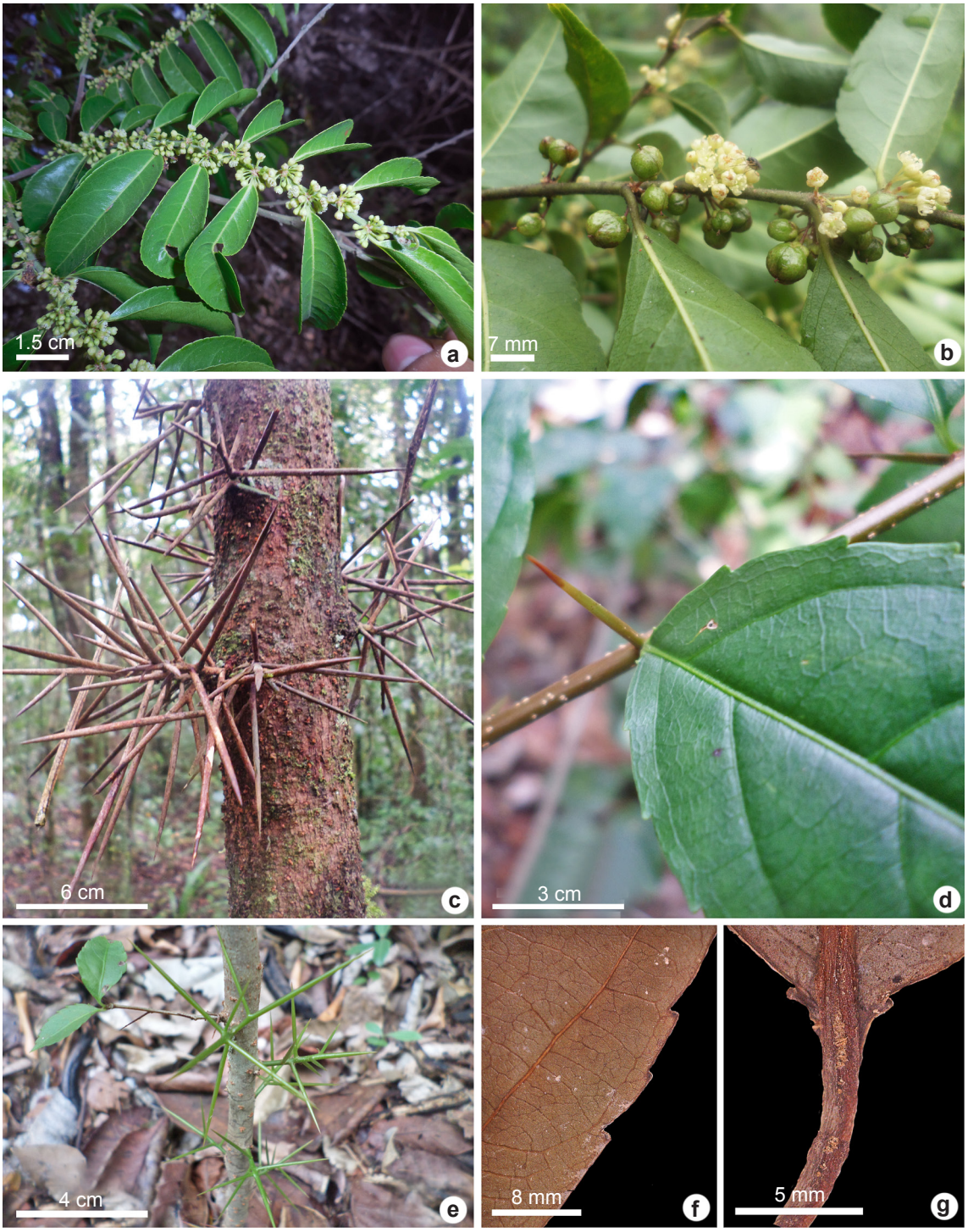

Figure 3 – a-g. Morphological characters of Salicaceae species occurring in Rio Preto National Forest – a-b. *Casearia sylvestris* – a. branch with leaves and inflorescences; b. branch with inflorescence and capsules; c-g. *Xylosma glaberrrima* – c. thorns on developed trunk; d. simple thorn on a branch; e. juvenile thorns (still green) on developing trunk; f. leaf margin detail; g. detail showing two glands at the leaf base.

Macrothumia kuhlmannii has endemic to Brazil where it occurs only in the Atlantic Forest domain (BFG 2018). Despite this, the species does not have an assessment for its conservation status. *Macrothumia* is monospecific and *M. kuhlmannii* differs from the other species of Salicaceae occurring in RPNF by having 5-nerved, glabrous leaves with two sessile glands at the base of the blade, and petiole 15–30 mm long. In the study area, few individuals of the species were found, in shady areas inside the forest fragments.

9. *Xylosma glaberrima* Sleumer, Fl. Neotrop. Monogr. 22: 175. 1980. Fig. 3c-g

Trees, armed, 4–6 m tall, dioecious. Branches glabrous, brownish, armed. Stipules absent. Thorns 4–12 cm long, glabrous, branched on the trunk and simple on the branches. Leaf blades 9–12 × 3–4.5 cm, elliptical, translucent punctation and traces absent, chartaceous to subcoriaceous, glabrous on both surfaces, base symmetrical, cuneate, glands-2 ate the base of leaf blade, slightly prominent, concave, glabrous, apex acute to short-acuminate, apicule absent, margin glandular-serrated, secondary veins 6–8 pairs; petiole 5–10 mm long, glabrous. Inflorescences 8–12 mm diam., axillary, fasciculate, sessile, bracts elliptical to ovate. Flowers unisexual; male flowers monochlamydeous, pedicel 5–6 mm long, glabrous; sepals 2–3 × 1.5–2 mm, oval, glabrous to ciliate; stamens 20, glabrous, anthers obloid; female flowers monochlamydeous, pedicel 5–8 mm long, glabrous, sepals 2.5–3 × 1.5–2.2 mm, oval, glabrous to ciliate, ovary 3–4 × 2–3 mm, ovoid, glabrous, style 0.2–0.5 mm long, entire, glabrous, persistent in the berry, stigma glabrous. Berries 5–10 mm in diam., globose, vinaceous to nigrescrente. Seeds not seen.

Material examined: trilha da Lagoa Seca, 28.XI.2018, *A. Nepomuceno et al. 552* (VIES); 28.III.2019, fl., *V.S. Miranda et al. 360* (VIES); trilha do Paliteiro, 20.II.2019, fr., *A. Nepomuceno et al. 772* (VIES); trilha da sede abandonada, 30.IV.2019, fl., *A. Nepomuceno et al. 806* (VIES).

Xylosma glaberrima is endemic to Brazil where it occurs only in the Atlantic Forest domain, being classified as a near-threatened species (NT) (BFG 2018; CNCFlora 2021). The species is morphologically similar to *Xylosma benthamii* (Tulasne 1847: 291) Triana & Planchon (1862: 17), but it can be differentiated by having flowers with glabrous pedicels (*vs.* flowers with pubescent pedicels) and 2 glands at the base of the leaf blade (*vs.* glands absent). In the study area, only a few individuals of the species were found, in shady areas inside the forest fragments.

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List of specimens examined

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