




The Flora of Paraíba State, Brazil: subfamilies Ajugoideae and Viticoideae (Lamiaceae)

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Abstract: The Lamiaceae family includes about 7,000 species allocated in 236 genera, with almost cosmopolitan distribution, currently divided into nine subfamilies. In Brazil 46 genera and 525 species occur, distributed in four subfamilies. Among these subfamilies, Ajugoideae and Viticoideae were originally parts of the Verbenaceae family, being transferred to Lamiaceae as a result of several systematic studies on the two families. Ajugoideae is characterized by having drupes with four mericarps, non-persistent styles and pollen grains with exine formed by granular and branched columns. On the other hand, Viticoideae is characterized to have drupes with 4-locular pyrenes or 2 2-locular pyrenes and exine microreticulate or slightly rough. We present here the results of a taxonomic survey of the subfamilies Ajugoideae and Viticoideae (Lamiaceae) for Paraíba State, Brazil, based on excursions to collect fertile material, analyses of specimens incorporated into herbaria in Paraíba (ACAM, CSTR, EAN and JPB) and Pernambuco State (IPA and PEUFR), and consultations of the *SpeciesLink* and Herbário Virtual REFLORA databases. Identifications were based on the specialized literature and the examination of type and protolog specimens. Ten species belonging to three genera, five belonging to the subfamily Ajugoideae (*Aegiphila integrifolia* (Jacq.) Moldenke, *A. luschnathii* Schauer, *A. pernambucensis* Moldenke, *A. verticillata* Vell. and *Amasonia campestris* (Aubl.) Moldenke) and five to the subfamily Viticoideae (*Vitex gardneriana* Schauer, *V. megapotamica* (Spreng.) Moldenke, *V. orinocensis* Kunth, *V. rufescens* A. Juss. and *V. schaueriana* Moldenke) were recorded. The taxonomic treatment includes a key to identify genera and species, descriptions, illustrations, taxonomic comments, geographic distribution, habitats and phenological data of the species.

Keywords: Floristics, Lamiales, Labiatae, Brazilian northeastern, taxonomy.

Flora da Paraíba, Brasil: subfamílias Ajugoideae e Viticoideae (Lamiaceae)

Resumo: A família Lamiaceae engloba cerca de 7.000 espécies alocadas em 236 gêneros, com distribuição quase cosmopolita, atualmente dividida em nove subfamílias. No Brasil ocorrem 46 gêneros e 525 espécies, distribuídas em quatro subfamílias. Dentre estas subfamílias, Ajugoideae e Viticoideae eram originalmente partes da família Verbenaceae, sendo transferidas para Lamiaceae como resultado de diversos estudos sistemáticos sobre as duas famílias. Ajugoideae caracteriza-se por possuir drupas com quatro mericarpos, estiletes não persistentes e grãos de pólen com exina formada por colunas granulares e ramificadas. Por outro lado, Viticoideae caracteriza-se por possuir drupas com um pirênio 4-locular ou 2 pirênios 2-loculares e exina microrreticulada ou levemente rugosa. O presente trabalho compreende o levantamento taxonômico das subfamílias Ajugoideae e Viticoideae (Lamiaceae) para o estado da Paraíba, Brasil. O estudo foi baseado em espécimes coletados em campo, na análise de coleções depositadas nos herbários ACAM, CSTR, EAN, IPA, JPB e PEURF) e na consulta às bases de dados *SpeciesLink* e Herbário Virtual REFLORA. Foram registradas 10 espécies em três gêneros, sendo cinco pertencentes à subfamília Ajugoideae (*Aegiphila integrifolia* (Jacq.) Moldenke, *A. luschnathii* Schauer, *A. pernambucensis* Moldenke, *A. verticillata* Vell. e *Amasonia campestris* (Aubl.) Moldenke) e cinco à subfamília Viticoideae (*Vitex gardneriana* Schauer, *V. megapotamica* (Spreng.) Moldenke, *V. orinocensis* Kunth., *V. rufescens* A. Juss. e *V. schaueriana* Moldenke). O tratamento taxonômico inclui uma chave para identificação dos gêneros e das espécies, descrições, ilustrações, comentários taxonômicos, distribuição geográfica, habitats e dados fenológicos das espécies.

Palavras-chave: Florística, Lamiales, Labiatae, Nordeste brasileiro, taxonomia.

Introduction

Lamiaceae Martinov is the largest family of the order Lamiales, comprising approximately 7200 species subordinated to 236 genera occurring in tropical and temperate regions throughout the world (Harley et al. 2004). A total of 46 genera and 525 species are known to be native to Brazil, although those numbers are almost certainly underestimations (BFG 2015).

Numerous morphological, chemical, and phylogenetic studies have had enormous impacts on the classification of the family, being possible to conclude that Lamiaceae would be a monophyletic group only with the transfer of about 50 genera were traditionally belonging to Verbenaceae (Cantino et al. 1992, Yuan et al. 2010).

Ajugoideae (Teucroioideae) contains 24 genera of woody or herbaceous plants, with single (rarely compound), opposite, alternate or spiral leaves and unilabial (rarely bilabial) corolla flowers (Harley et al., 2004). According to Judd et al. (2009), is considered monophyletic and is delimited by the following synapomorphies: drupes with four mericarps, non-persistent styles and pollen grains with exine formed by granular and branched columns.

Viticoideae includes 10 genera of arboreal, shrub and lianescent habit (rarely herbaceous), with single or composite, decussate or spiral leaves and frequently bilabial corolla flowers (rarely unilabiate) (Harley et al., 2004). This subfamily is considered as a polyphyletic group and is characterized by having drupes with a 4-locular pyrenes or two 2-locular pyrenes and pollen grains with microreticulated or slightly rough exine (Judd et al., 2009).

Bentham (1832-1836, 1848, 1876) was the first author to undertake floristic/taxonomic studies of the family Lamiaceae, describing various genera and species, although the principal work focusing on representatives of that family in Brazil is still the *Flora Brasiliensis* produced by Schmidt (1858).

Some taxonomic studies on the family were carried out in the country, as Harley (2007), for the Ducke Reserve; Harley (2012), for the Brazilian Amazon; Silva-Luz et al. (2012), for the Serra do Cipó, Minas Gerais; Harley (2016), for Serra do Carajás, Pará and Mota et al. (2017), for Serra Negra, Minas Gerais. For the Brazilian northeast, the floristic and taxonomic information about Lamiaceae are scarce, and it is limited to records of new species, evidencing the importance of new studies in the region to contribute to the knowledge of the wealth and distribution of this family (Almeida & Albuquerque 2002; Soares et al. 2017). For the Paraíba state, in addition to mentions to their representatives in floristic lists, an annotated list of the species of Lamiaceae was produced by Rocha & Agra (2001), with a record of 23 species and 10 genera.

For the subfamily Ajugoideae in Brazil, studies that deal with the taxonomy of the group are scarce and there is only the study of Santos et al. (2012) and França (2003). For the subfamily Viticoideae the scenario is even more precarious, having only the study of Lima & França (2009).

We present here a taxonomic survey of the subfamilies Ajugoideae and Viticoideae (Lamiaceae) for Paraíba State, in northeastern Brazil, presenting descriptions of native species, data concerning flowering, fruiting and geographic distributions, a list of the materials examined, illustrations, and a key for the identification of the species.

Materials and Methods

Paraíba State (-06°00'11" to -08°19'54" S and -34°45'50" to -38°47'58" W) is located in northeastern Brazil, bordering Rio Grande do Norte State to the north; Pernambuco State to the south; the Atlantic Ocean at Ponta do Seixas to the east; and Ceará State to the west. Paraíba comprises 223 municipalities and covers a land area of almost 56,500 km², being one of the smallest Brazilian states. It is geographically divided into four mesorregions: Mata, Agreste, Borborema, and Sertão (Anuário Estatístico da Paraíba, 2015) (Figure 1). Located in the equatorial region of South America, it receives high levels of solar radiation, creating a hot climate with mean annual temperatures between 22 and 26 °C; mean annual rainfall varies from 800 to 1600 mm (AESAs 2006).

The vegetation of Paraíba state reflects the different environmental conditions found in its distinct geomorphological regions, presenting different vegetation formations (Figure 2): restinga forests, mangroves, sawdust and remnants of Atlantic Forest and in the hinterland, caatinga and enclaves of mountain forests (Carvalho & Carvalho 1985).

The climate is considered semi-arid (BSh), with annual rainfall less than 800 mm, extending throughout the Borborema plateau, where in the Paraíba river valley, the annual rainfall is about 400 mm, considered one of the driest places of Brazil (Alvares et al. 2013).

Fertile specimens (with flowers and/or fruits) were collected. The study was based on fieldwork carried out between May/2016 and June/2017. The collected material was incorporated in the ACAM herbarium at *Campus I*, Universidade Estadual da Paraíba (UEPB). Complemented analyses were made with specimens housed at various herbaria in northeastern Brazil (CSTR, EAN, IPA, JPB and PEUFR), and with images available from virtual herbaria (B, G, HUEFS, HUNEB, K, MAC, NY, RB, SP, and UFP) (Thiers continuously updated) available on the JSTOR and *Species Link* platforms.

The morphological analyses were based on specimens collected in Paraíba State during the present study, complemented with examinations of specimens deposited in the above-mentioned herbaria and, when appropriate, consultations of nomenclatural types and protologues. The taxonomic identifications of the genera and species were based on classical literature: De Candolle (1848), Schmidt (1858), and Bentham & Hooker (1876), as well as specialized bibliographies: Hsi-wen & Hedge (1994), Harley (2007), Santos et al. (2012), Harley (2012), Silva-Luz et al. (2012), and Martínez-Gordillo et al. (2013).

The terminological designations to the morphological descriptions follow Lawrence (1973), Radford et al. (1974), and Harris & Harris (2001). We present keys to the identifications of genera and species, and illustrations of the diagnostic characteristics of the species. Also included are commentaries concerning taxonomic affinities based on vegetative and reproductive morphological characteristics, information concerning geographic distributions, the environments where the taxa are encountered, and the flowering and/or fruiting of the species.

This study is part of the "Flora of Paraíba" project and seek to update the current list of species occurring in the state since, to date, the only work of the taxonomy of the family is Rocha & Agra (2001), which contains exclusively the list of species found in Paraíba.

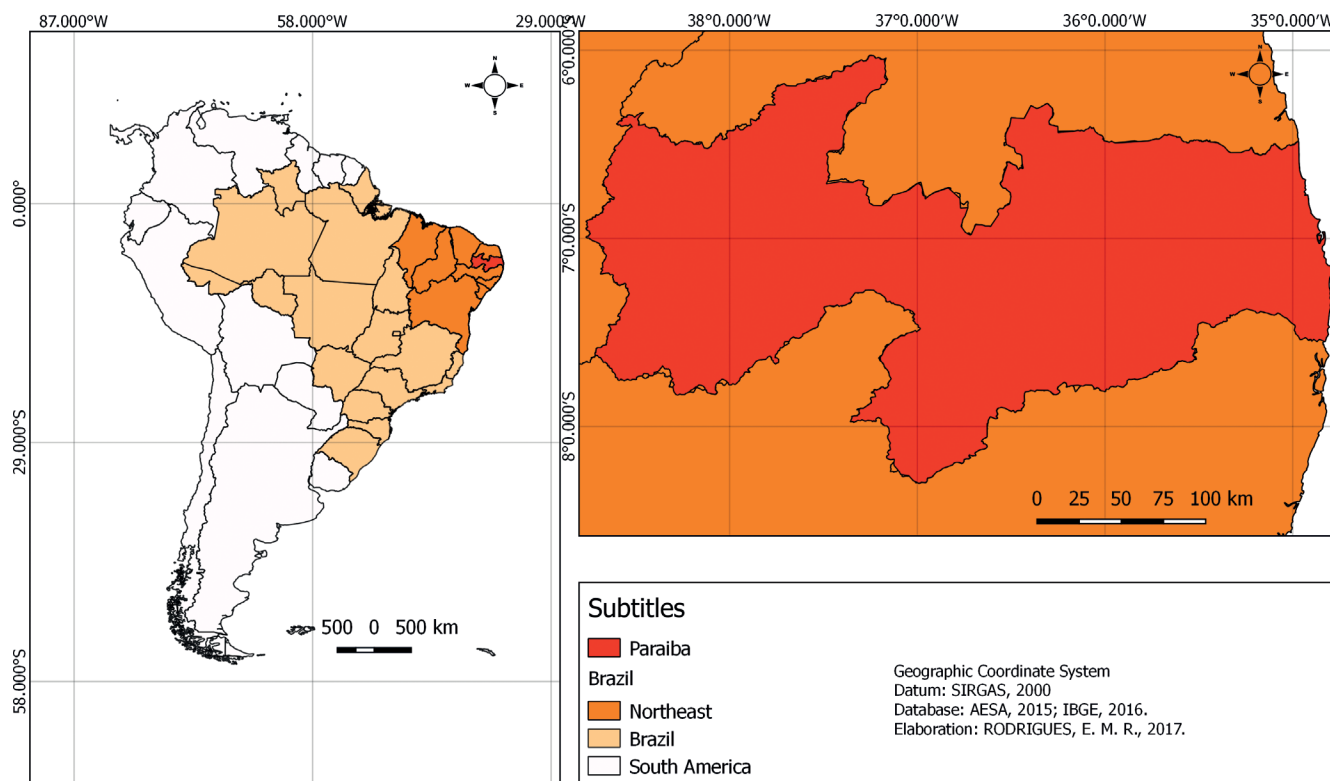


Figure 1. Map of the study area, Paraíba State, Brazil.

Results and Discussion

Ten species belonging to three genera were encountered, five belonging to Lamiaceae subfam. Ajugoideae [*Aegiphila integrifolia* (Jacq.) Moldenke, *A. luschnathii* Schauer, *A. pernambucensis* Moldenke, *A. verticillata* Vell. and *Amasonia campestris* (Aubl.) Moldenke], and five belonging to Lamiaceae subfam. Viticoideae [*Vitex gardneriana* Schauer, *V. megapotamica* (Spreng.) Moldenke, *V. orinocensis* Kunth, *V. rufescens* A. Juss., and *V. schaueriana* Moldenke].

Identification key to genera of Ajugoideae and Viticoideae from the Paraíba State

- 1. Simple leaves, alternate; bracts ovate to obovate *Amasonia*
- 1'. Compound leaves, opposite to subopposite; bracts filiform or lanceolate2
- 2. Branches puberulous or setulosus. Actinomorphic flowers; 4-laciniate, obconical calyx; corolla white to cream; stamens isodynamous. Nuculanium fruit *Aegiphila*
- 2'. Branches glabrescents. Zygomorphic flowers; 5-laciniate, campanulate calyx; corolla lilac; stamens didynamous. Drupaceous fruit *Vitex*

Taxonomic treatment

Aegiphila Jacq., Observ. Bot. 2: 3. 1767.

Type: *Aegiphila martinicensis* Jacq.

Tree or erect shrub dioecious; puberulous or setulosus branches. Leaves decussate, often opposite, sometimes verticillate (rarely alternating), petiolate. Multiflorous cymes, rarely unifloras; filiform

bracts. Pedicellate flowers, actinomorpha; calyx obconical in anthesis, with 4 lacinia; fruiting calyx cupuliform; corolla infundibuliform to hypocateriform, white to cream; stamens 4, rarely 2, isodynamous; single style, deeply bifid at apex. Nuculanium, obovoid, cylindrical or sub-spherical, yellow, orange or red; pyrenes 4, obovoids.

Aegiphila Jacq. comprises about 150 Neotropical species, of which 32 occur in Brazil and four species occur in Paraíba state (França & Giulietti 2012, Flora do Brasil 2020, in constr.).

Identification key to the species of *Aegiphila* from Paraíba State

- 1. Branches generally pale red when dry; leaves alternate, generally verticillate; bracts filiform; anthers oval 4. *A. verticillata*
- 1'. Branches cinereous when dry; leaves opposite; bracts linear to subulate; anthers oblong to elliptic2
- 2. Leaf margins slightly revolute; lacinia mucronate; nuculanium 4–8 mm diam., rounded 2. *A. luschnathii*
- 2'. Leaf margins flat; lacinia apiculate; nuculanium 5–8 mm diam., oblong to elliptic3
- 3. Inflorescence a congested axillary cyme; peduncle 0.6–1.8 cm long; calyx obconical; corolla infundibuliform; anthers elliptic; ovary piriform ... 1. *A. integrifolia*
- 3'. Inflorescences in solitary axillary cymes; peduncle 2–8 mm long; calyx campanulate; corolla hypocateriform; anthers oblong; ovary subglobose 3. *A. pernambucensis*

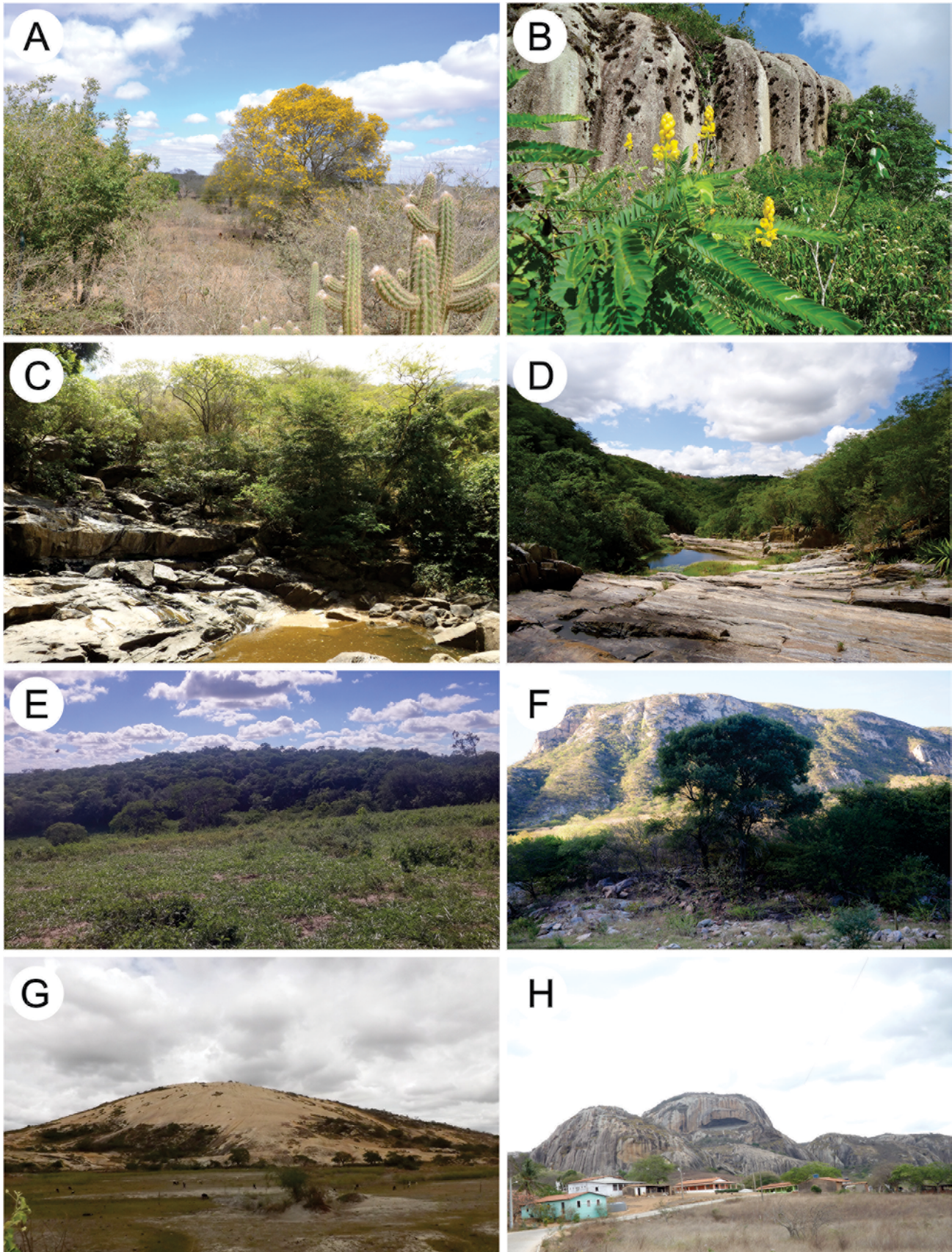


Figure 2. Municipalities visited in Paraiba State. a) APA do Cariri, Boa Vista; b) Afloramento granítico, Puxinanã; c) Cachoeira do Roncador, Bananeiras; d) Cachoeira do Pinga, Lagoa Seca; e) Fazenda Ipuarana, Lagoa Seca; f) Serra do ABA, Passagem; g) Serra do Jatobá, Serra Branca; h) Parque Estadual Pedra da Boca, Araruna. Photographs: E.R.F. Souza, F.K.S. Monteiro, H.C. Araújo, S.L. Costa, T.S. Silva.

1. *Aegiphila integrifolia* (Jacq.) B.D. Jacks., Index Kew. 1: 46. 1895 [1893]. \equiv *Aegiphila sellowiana* Chamisso, Linnæa 7: 111-112, 1832. Lectotype (designated by França & Giulietti, 2013): [icon] Jacquin, Select. Stirp. Amer. Hist., tab. 173, fig. 7. 1763. Epitype (designated by França & Giulietti, 2013): Venezuela, Amazonas, Rio Atabapo, near Yavita, 10 Junho 1959, J.J. Wurdack & L.S. Adderley 42905 (RB). Figure 3 a-b

Trees or shrubs, 3–10 m tall; branches tetragonal, tomentose, cinereous when dry. Leaves opposite, petiolate; petiole 1.9–2.1 cm long, tomentose; blade 8.1–18.1 \times 3.7–6.8 cm, membranaceous, chartaceous when dry, discolor, obovate to elliptic, apex acuminate, margins entire, flat, base attenuated to slightly decurrent, face adaxial pubescent, face abaxial tomentose. Inflorescence 1.5–2.7 cm long, congested axillary cymes, pedunculate, peduncle 0.6–1.8 cm long; bracts 4 \times 1 mm, subulate. Flowers pedicellate; pedicel 2–4 mm long; calyx ca. 6 mm long, obconical, short-dentate, truncated, pubescent externally, glabrous internally; lacinia 1–2 mm long, apiculate, ovate; corolla 4–6 mm long, infundibuliform, white to cream; tube ca. 3 mm long; lobes 2–3 mm long, oblong-ligulate; stamens ca. 4 mm long (largest), ca. 3 mm long (smallest), exerted in staminate flowers, enclosed in pistillate flowers; filaments ca. 3 mm long; anthers ca. 1 mm long, elliptic; gynoecium ca. 2 cm long, ovary ca. 3 mm long, piriform; style ca. 1.5 cm long; stigma ca. 1 mm long. Nuculanium 5–8 diam, elliptic, white-yellowish; 1-seeded.

Material examined: BRAZIL, PARAÍBA: Areia, Escola Agrônômica do Nordeste, 6°58'13.40"S and 35°42'48.53"W, 525 m, 28.IV.1945, fr., J.C.M. Vasconcelos 853 (NY); João Pessoa, Bacia hidrográfica do Rio Timbó, 7°06'54.0"S and 34°51'47.2"W, 41 m, fl., 10.V.2006, M.F.A. Lucena s/n (JPB 35007);

The species is distributed through Ecuador, Bolivia, Paraguay, Argentina, and Brazil (all of its states), being associated with all of the phytogeographical domains, being found in anthropic areas, rupestrian fields, ciliary forests, seasonal forests, ombrophilous forests and Amazonian savannah (BFG 2015, Harley et al. 2015). Encountered flowering in May in the study area, present in environments of Atlantic Forest and anthropic areas.

Aegiphila integrifolia can be recognized, principally, by having an elongated petiole (1.9–2.1 cm long) in relation to the other species encountered in the study area, leaf blades membranaceous, bracts subulate, and a corolla yellowish

2. *Aegiphila luschnathii* Schauer, Prodr. 11: 651. 1847. Lectotype (designated by França & Giulietti, 2013): Brazil, Rio de Janeiro, Copacabana, July 1833, B. Luschnath s.n. [Herb. Mart. 1040] (BR[0000005505562], BR[0000005505890], BR[0000005505364]).

Shrubs, ca. 2 m tall; branches tetragonal, slightly sulcate, pubescent, glabrescent when mature, cinereous when dry. Leaves opposite, decussate, petiolate; petiole 3–7 mm long, pubescent; blade 4.4–13.3 \times 2.5–5.8 cm, membranaceous, becoming coriaceous when mature, discolor, elliptic to ovate, apex cuspidate to acute, margins slightly revolute, base attenuated, abaxial and adaxial faces setulose. Inflorescence 2.5–4.8 cm long, axillary multifloral cyme, pedunculate; peduncle 0.5–1.1 cm long; bracts 1–3 mm long, subulate. Flowers short-pedicellate; pedicel 1–2 mm long; calyx 2–4 mm long, truncated-apiculate, externally pubescent, lacinia ca. 1 mm long, mucronate; corolla 3–5 mm long, infundibuliform, white to cream; tube ca. 3 mm; lobes ca. 2 mm long, oblong-ligulate; stamens ca. 5 mm long (largest),

ca. 4 mm long (smallest), exerted in staminate flowers, enclosed in pistillate flowers; stamens ca. 4 mm long (largest), ca. 3 mm long (smallest); anthers ca. 1 mm long, oblong; gynoecium ca. 8 mm long, ovary ca. 1 mm long, subcylindrical; style ca. 5 mm long; stigma ca. 1 mm long. Nuculanium 4–8 mm diam., rounded, orangish; 1-seeded.

Material examined: BRAZIL, PARAÍBA: Bananeiras, Campus da UFPB, 6°45'00.0"S and 35°37'59.9"W, 555 m, fr., 06.IX.1996, M.R. Barbosa 1546 (JPB).

Additional examined material: BRAZIL, ALAGOAS: Palmeira dos Índios, 9°12'37.4"S and 36°24'03.6"W, 753 m, fl., 16.VIII.2001, R.P. Lyra-Lemos 5772 (MAC).

Species endemic to Brazil, encountered in the northeastern (BA, CE, PB and PE), southeastern (ES, MG, RJ and SP), and southern (SC) regions of that country, associated with Caatinga and Atlantic Forest vegetation (BFG 2015, Harley et al. 2015). It was collected with fruits in September, being found in Atlantic Forest vegetation. Although it is an endemic species in Brazil, it is not often found in the study area because of the scarce collection effort, and there is only one exsiccatae, inferring that the species may be at danger in the state.

Can be distinguished from the other congeneric species encountered in the study area by having leaf margins slightly revolute, calyx truncated-apiculate, and flowers short-pedicellate (1–2 mm long).

3. *Aegiphila pernambucensis* Moldenke, Phytologia 1: 257. 1937. Holotype: Brazil, Pernambuco, Tapera, 14 July 1932, B.J. Pickel 3042 (NY[103821], isotypes CAS[0000114], MICH[1108332], NY[103823], P[00650916], US[00149220], WIS[0255180]).

Trees or shrubs, ca. 3 m tall; branches tetragonal, pubescent, cinereous when dry. Leaves opposite decussate, petiolate; petiole 3–12 mm long, tomentose; blade 3–6.5 \times 1.3–2.8 cm, chartaceous, ovate to oblong-elliptic, apex acute to acuminate, margins entire, base attenuated, face adaxial setulose, face abaxial villous. Inflorescence 0.8–2 cm long, solitary axillary cymes, pedunculate, peduncles 2–8 mm long; bracts 2–3 mm long, linear. Flowers pedicellate; pedicel ca. 2 mm long; calyx 2–4 mm long, campanulate, tomentose, lacinia 1–2 mm long, apiculate; corolla ca. 4 mm long, hypocrateriform, white; tube ca. 2 mm long; lobes ca. 2 mm long, oblong-ligulate; stamens ca. 6 mm long (largest), ca. 5 mm long (smallest); filaments ca. 4 mm long (largest), ca. 3 mm long (smallest); anthers ca. 2 mm long, oblong; gynoecium ca. 7 mm long, ovary ca. 1 mm long, subglobose; style ca. 4 mm long; stigma ca. 2 mm long. Nuculanium ca. 6 mm long, oblong, red; 1-seeded.

Material examined: BRAZIL, PARAÍBA: Areia, Engenho Macacos, 6°57'48.0"S and 35°41'30.1"W, 542 m, 08.V.1953, fl., J.C. Moraes (EAN 675); Mata do Pau-Ferro, 6°57'48.0"S and 35°41'30.1"W, 542 m, 23.XI.1980, fl., V.P.B. Feveireiro et al. 101 (EAN); Mata do Pau-Ferro, 6°57'48.0"S and 35°41'30.1"W, 542 m, 17.III.1992, fl., L.P. Felix 4756 (EAN); Caaporã, Sítio Brejo de Lima, 7°26'19.0"S and 34°57'19.0"W, 99 m, 06.II.2015, fl., P.C. Gadelha-Neto 3914 (JPB); João Pessoa, Bairro do Altiplano, 7°06'54.0"S and 34°51'47.2"W, 41 m, 30.XII.1986, fl., L.P. Felix & G.V. Dornelas 1276 (EAN); Bairro do Altiplano, 7°06'54.0"S and 34°51'47.0"W, 47 m, fr., 07.VII.1993, O.T. Moura 1034 (JPB); Jardim Botânico, 7°03'36.0"S and 34°31'12.0"W, 99 m, 15.II.2012, fl., P.C. Gadelha-Neto 3177 (JPB); Mamanguape, Sema I – Água Fria, 6°50'19.0"S and 35°07'34.0"W, 40 m, 05.IV.1989, fl., L.P. Felix & E.S. Santana s/n (EAN 5957); Sema II – Cabeça de Boi, 6°50'19.0"S and 35°07'34.0"W, 40 m., 01.II.1989, fl., L.P. Felix & E.S.

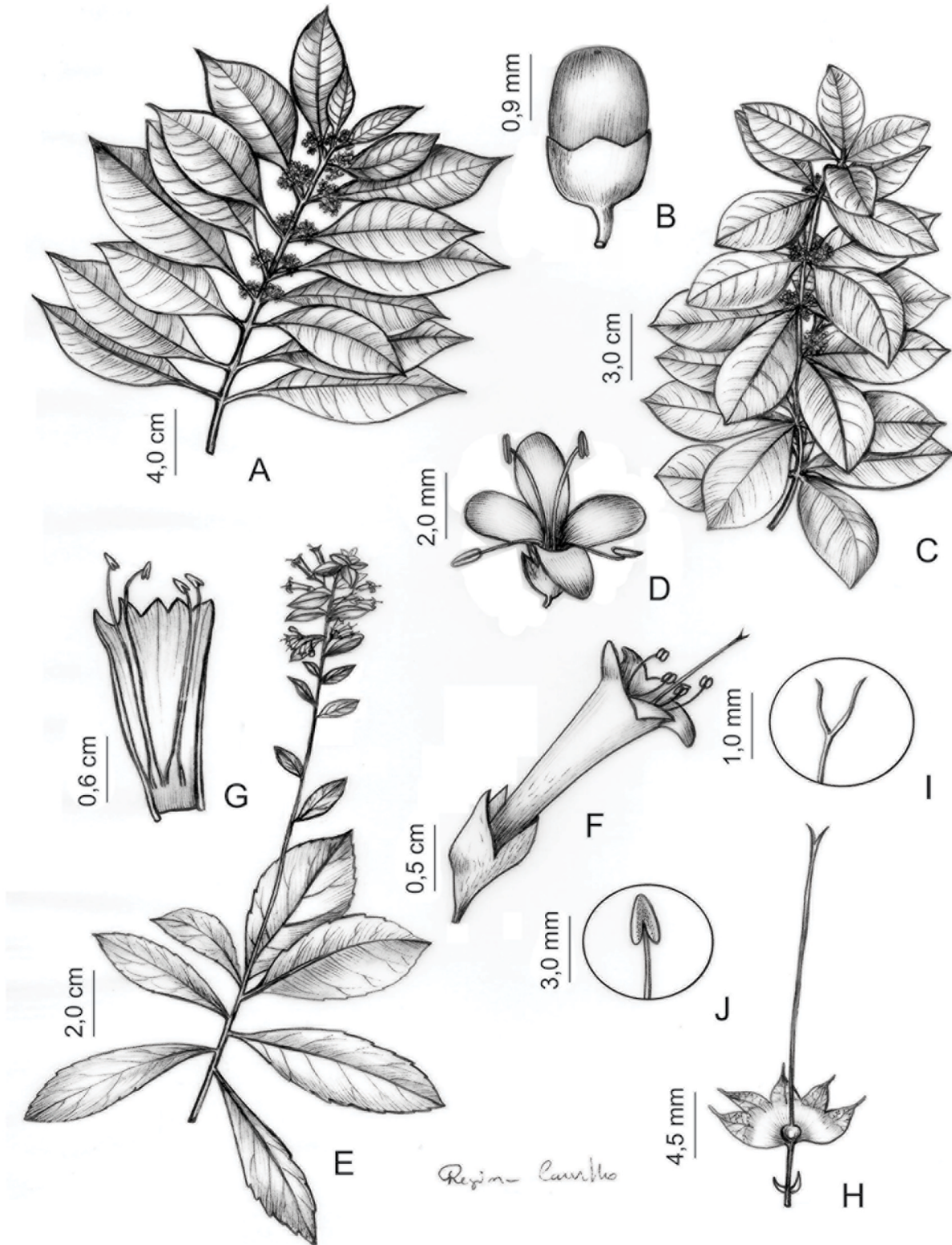


Figure 3. a-b) *Aegiphila integrifolia*: a) Reproductive branch; b) fruit. c-d) *A. verticillata*: c) reproductive branch; d) staminate flower. e-j) *Amasonia campestris*: e) Habit with inflorescence; f) flower; g) open corolla showing the stamens; h) open calyx showing the gynoecium; i) detail of the stigma; j) detail of the anthers. A-b) Queiroz 9227; c-d) Hatschbach 41838; e-j) Costa 95.

Santana s/n (EAN 6365); Mataraca, Millenium Inorganic Chemicals Mineração Ltda., 6°30'08.9"S and 36°58'41.0"W, 46 m, 18.II.2011, fl., P.C. Gadelha-Neto 2903 (JPB); Área de aterro controlado, 6°30'08.0"S and 34°58'37.0"W, 16 m, fl., 28.I.2011, I.B. Lima 1174 (JPB); Pedras de Fogo, 7°12'03.6"S and 35°01'31.8"W, 25 m, 21.VI.2010, fl., P.C. Gadelha-Neto 2882 (JPB).

Aegiphila pernambucensis is endemic to Brazil; its distribution is restricted to the northeastern region (Alagoas, Bahia, Paraíba and Pernambuco) and associated with Atlantic Forest vegetation (Harley et al. 2015). Its flowering period in the study area occurred between February and June, November and December, with fruiting in July. In Paraíba state is found in anthropic areas, seasonal forests and ombrophilous forests.

This species can be recognized by its inflorescence in solitary axillary cymes, linear bracts, and red nutlets.

4. *Aegiphila verticillata* Vell., Fl. Flumin. 1: 37, t. 91. 1825 [1829]. ≡ *Aegiphila lhotzkiana* Chamisso, Linnaea 7: 112-113, 1832. Lectotype (designated por Coimbra & Santos 2000): [icon] Vellozo, Fl. Flumin. Icones 1: 91. 1831. Epitype (Designated por França & Giuletto): Brasil, Paraná, Bocaiúva do Sul, Cerrado, 05 Dezembro 1978, *G. Hatschbach 41838* (MBM). Figure 3 c-d

Trees or shrubs, 1–4 m tall; branches tetragonal, villous to tomentose, generally pale red when dry; Leaves alternate or occasionally verticillate, short-petiolate, petiole 1–5 mm long, tomentose; blade 5.1–11.2 × 3–6.8 cm, chartaceous, oblong-obovate to ovate-elliptic, apex acute to acuminate, margins entire, base acute to acuminate, face abaxial lanuginose to tomentose, face adaxial pubescent or glabrescent. Inflorescence ca. 2.4 cm long, axillary, in congested cymes, with 2-10 flowers, peduncle 0.5–2 cm long, pubescent; bracts 2–3 × 1–2 mm, filiform, tomentose; bracteoles 1.2–2.2 × 1–1.5 mm, similar to the bracts. Flowers staminate, pedicellate; pedicel 2–3 mm long, pubescent; calyx 3–9 mm long, obconical to campanulate, tomentose, truncated; lacinia 1–4 mm long, widely elliptic; corolla 3–4 mm long, white to cream, infundibuliform, tube ca. 3–4 mm long, lobes 1.5 mm long, lanceolate-ligulate; stamens ca. 4 mm long (largest), ca. 3 mm long (smallest); filaments ca. 3 mm (largest), ca. 2 mm long (smallest); anthers ca. 1 mm long, ovate; gynoecium ca. 4 mm long, ovary ca. 1 mm long, globose; style ca. 3 mm long, stigma ca. 1 mm long, bifid. Nuculanium, oblong, yellowish; 1-seeded.

Material examined: BRAZIL, PARAÍBA: Mamanguape, 6°54'46.0"S and 35°04'25.0"W, 50 m, 27 jul 2001, V.C. Souza 26600 (HUEFS); Santa Rita, Usina São João, 7°57'00.0"S and 35°00'00.0"W, 30 m, s/d, M.F. Agra 1438 (HUEFS).

The taxon is distributed in Bolivia, and in all regions of Brazil, associated with Caatinga, Cerrado, Atlantic Forest, Pantanal, and Amazonian vegetation (BFG 2015, Harley et al. 2015, Salimena & Silva 2009). It was found with flowers in July in areas of restinga and Caatinga enclaves.

Aegiphila verticillata can be distinguished from the other congeneric species encountered in the study area by having branches generally pale red or rust-colored when dry, leaves alternate or occasionally verticillate, short-pedicellate, with oblong, yellowish nuculanium.

Amasonia L. f., Suppl. Pl. 48, 294. 1781[1782].

Type: *Amasonia erecta* L. f.

Herbs, sub-shrubs or shrubs; branches puberulent, pubescent, velutine, villous or shaggy. Leaves alternate, spiral, usually grouped at the base of the branches or below the inflorescences, subsessile or petiolate. Inflorescences thyrsoid; cymes arranged spiral, sometimes reduced to a single flower; bracts ovate, elliptic, oblong, oblanceolate or obovate. Flowers pedicellate, zygomorphs; calyx tubular-campanulate with 5 lacinia; infundibuliform corolla, white or yellowish; stamens 4, didynamous; stigma bifid, unequal stigmatic segments. Fruit drupaceous, spherical, greenish to black.

Amasonia comprises eight species with exclusively Neotropical distributions, and includes herbs to shrubs, generally with leaves subsessile to short-pedicellate grouped at the median-basal portions of the branches. Inflorescence a thyrsoid, or solitary flowers, subtended by a bract, generally red. Corolla infundibuliform, yellowish or white, slightly 2-labiate. Fruits drupaceous, black, pyrene 1-seeded (Harley et al. 2004, Steane et al. 2004, Santos et al. 2012).

5. *Amasonia campestris* (Aubl.) Moldenke, Torreyia 34: 8. 1934. ≡ *Taligalea campestris* Aubl., Hist. Pl. Guiane 2: 625, t. 252. 1775. Type (not designed): Guyane Française, J.B.C. Fusée Aublet (BM?, MPU[012956]). Figures 3 e-j; 5 a-b

Subshrubs, ca. 65 cm tall; branches cylindrical to subtetragonal, brown, densely pubescent; leaves alternate, grouped in the median portions of the branches, short-petiolate; petiole 2–5 mm long, cylindrical, pubescent; blade 4.6–6.9 × 1.9–3.6 cm, membranaceous, bifacial, obovate to oblanceolate, face adaxial dark green, glabrescent, face abaxial light green, pubescent, apex acute, margins serrated, base attenuated. Inflorescence pauciflorous, cymes with 1–3 flowers; peduncle 0.7–2.2 cm long; rachis 7-12 cm long, cylindrical, vinaceous, pubescent; bracts 1.7–2.3 × 1–2 cm, elliptic to oblong, vinaceous; bracteoles 3-7 mm long, reddish, filiform; calyx 7–9 × 3–4 mm, campanulate, chartaceous; lacinia 1–2 mm long, oval, acuminate; corolla 1.4–2.7 cm long, yellowish; tube 1.2–2.2 cm long, externally puberulent, internally glabrous; lobes 2–3 × 1–2 mm, narrowly elliptic; stamens 2.8–3 cm long; filaments 2.5–2.7 cm long, pubescent in basal portion; anthers ca. 2 mm long, oblong; gynoecium ca. 3.3 cm long; ovary ca. 3 mm long, globose; style ca. 3 cm long, glabrescent; stigma ca. 3 mm long. Drupe 7–8 × 6–7 mm, globose, brown. Seeds 2.

Material examined: BRAZIL, PARAÍBA: São José de Piranhas, Parque Ecológico Engenheiro Ávidos, Serra do Frade, trilha na subida da Serra, 503 m, 06°59'27.2"S and 38°28'51.0"W, 23.III.2015, fl., *F.C.P. Costa 95* (HUNEB).

Widely distributed in Central America (Trinidad and Tobago) and South America (Brazil, Guianas, Suriname, and Venezuela) (Moldenke 1939, 1982; Santos et al. 2012). Occurs in the northern (Acre, Amazonas, Amapá e Pará), northeastern (Bahia, Ceará, Maranhão, Pernambuco e Piauí), central-western (Goiás e Mato Grosso), and southeastern (Espírito Santo) regions of Brazil, in Caatinga, Campo Rupestre, Cerrado, and upland forest vegetation (Harley et al. 2015). Was encountered flowering in March in the study area, present in anthropized area and in Caatinga areas.

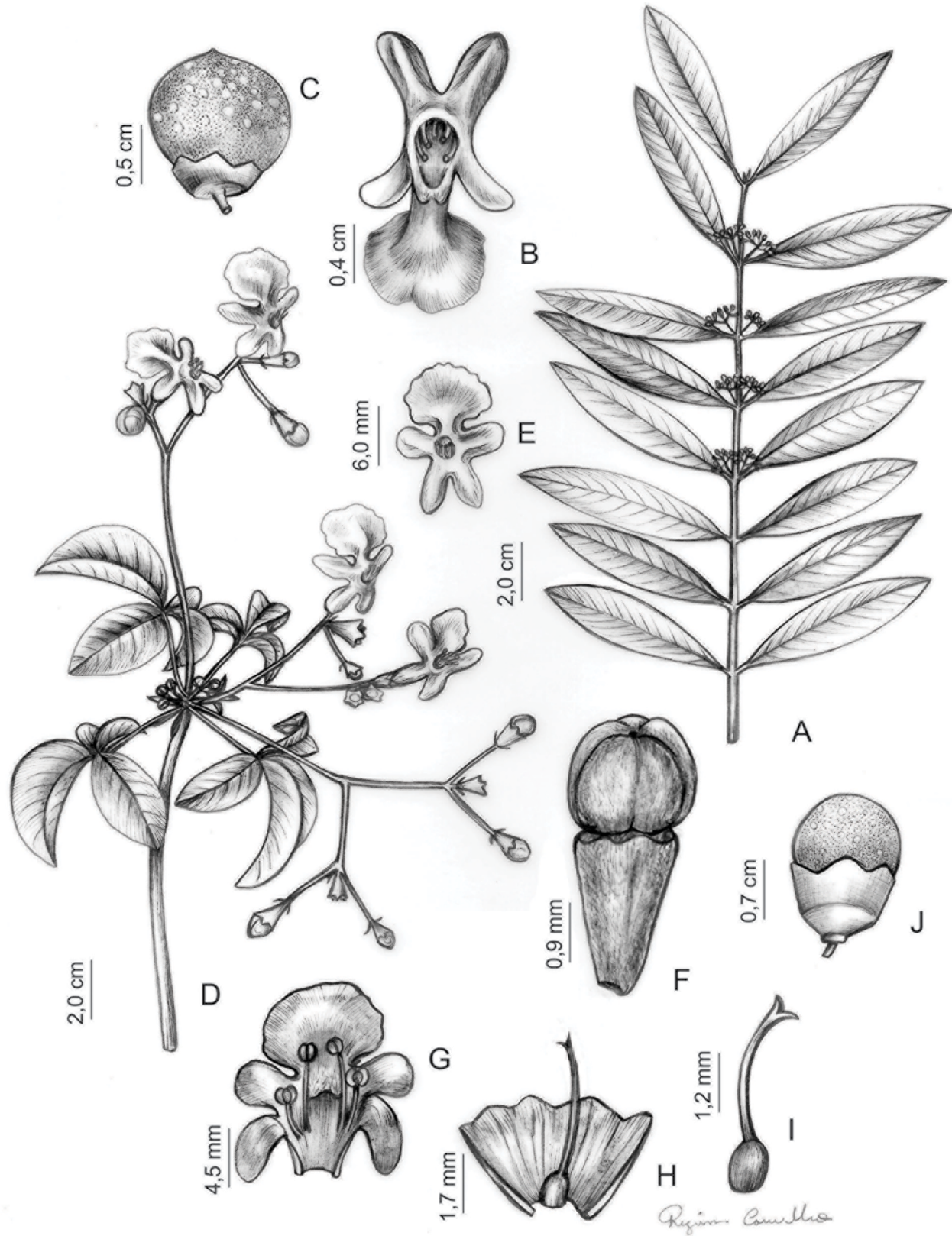


Figure 4. a-c) *Vitex gardneriana*: a) Reproductive branch; b) flower; c) fruit. d-j) *V. orinocensis*: d) Reproductive branch; e) flower; f) floral bud; g) open corolla showing the stamens; h) open calyx showing the gynoecium; i) gynoecium; j) fruit. a-c – Gardner, 1107; d-j – Monteiro et al. 55, 63.

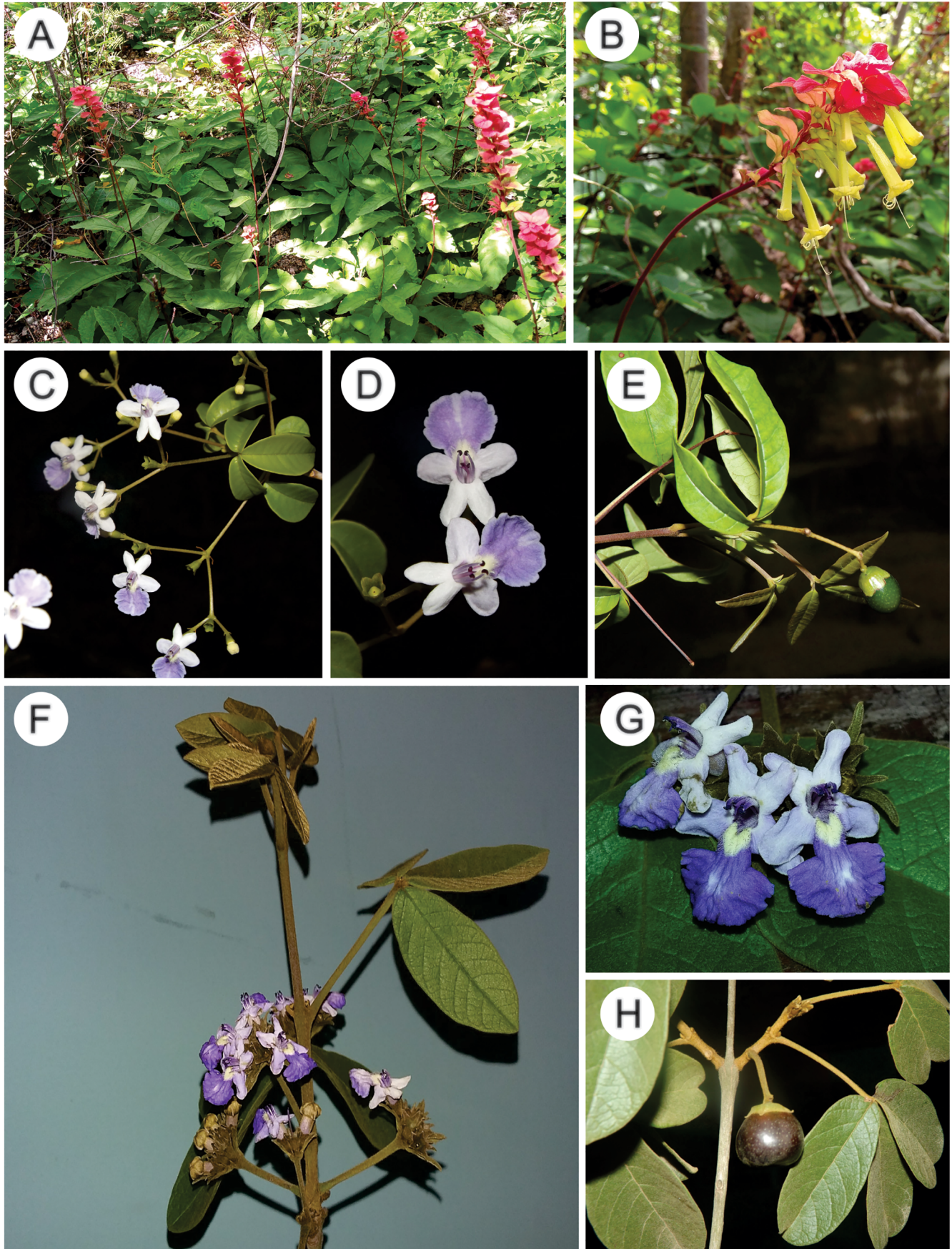


Figure 5. a-b) *A. campestris*: a) habit; b) inflorescence. c-e) *V. orinocensis*: c) inflorescence; d) flowers; e) immature fruit. f-h) *V. rufescens*: f) inflorescence; g) flowers; h) mature fruit. Photographs: a-b – F.C.P. Costa; c-h – F.K.S. Monteiro.

Amasonia campestris can be recognized by its serrated leaf margins, pauciflorous inflorescence with cymes having 1–3 flowers and bracts vinaceous.

Vitex [Tour.] L., Sp. Pl. 2: 638, 1753.

Lectotype (designated by Britton & Wilson, 1925): *Vitex agnus-castus* L.

Trees or shrubs erect, rarely prostrate; glabrescent branches. Leaves opposite, palmate, 3-7-foliolate, rarely unifoliate or simple, petiolate. Panicleiform inflorescence; dichasial cymes axillary or terminal; bracts lanceolate. Flowers pedicellate, zygomorphs; calyx cupulate or cupuliform, 5-laciniate; corolla infundibuliform, lilac; stamens 4, didynamous; style filiform, bifid stigma. Fruit drupaceous, globose, greenish, vinaceous, black or dark brown.

Vitex comprises approximately 250 species distributed throughout tropical and subtropical regions, with arboreal or shrub habits, rarely prostrate shrubs, leaves compound palmate (unifoliolate in some cases), inflorescence terminal or axillary, calyx campanulate or cupuliform, corolla (4-) 5-lobed, infundibuliform, anthers black to purple; fruit a drupe, globose, 1–4 seeds (Bramley et al. 2009).

Identification key to the species of *Vitex* from Paraíba State

1. Leaves unifoliolate, decussate; anthers basifixed6. *V. gardneriana*
- 1'. Leaves 3-5 foliolate, never decussate; anthers dorsifixed2
2. Branches tetragonal, ferruginous, pubescent9. *V. rufescens*
- 2'. Branches cylindrical to subcylindrical, cinereous, glabrous3
3. Stamens emerging from the median portion of the corolla, ovary oblong7. *V. megapotamica*
- 3'. Stamens emerging from the distal portion of the corolla; ovary globose4
4. Central leaflet subcoriaceous; bracts filiform 2–3 mm long; anthers ovoid 8. *V. orinocensis*
- 4'. Central leaflet chartaceous; bracts oval 3–5 mm long; anthers cylindrical 10. *V. schaueriana*

6. *Vitex gardneriana* Schauer, Prodr. 11: 687-689. 1847. Lectotype (Designated by França 2010): Brazil, Pernambuco, “in rivis Capiberibe, Moxoto”, 1842 (fl), *Houlet s.n.* (BR[0000005628612]). Figure 4 a-c

Shrubs to trees 2–6 m tall; branches subcylindrical, villous to setaceous, cinereous. Leaves unifoliolate, decussate, petiolate; petiole 0.7–1.2 cm long, villous; blade 5–9 × 1.5–2.3 cm, coriaceous, oblong-elliptic, apex acuminate, margins entire, base cuneate to attenuate, face adaxial glabrous, face abaxial villous. Inflorescences 1.4–1.7 cm long, axillary cymes, congested, pedunculate, peduncle 0.8–1 cm long; bracts 4–6 mm long, lanceolate. Flowers short-pedicellate; pedicel 1–3 mm long; calyx 3–5 mm long, campanulate, short-dentate, externally pubescent; lacinia ca. 1 mm long, apiculate; corolla ca. 1.8 cm long, tubular, violet to blue; tube ca. 1 cm long; upper and lateral lobes ca. 5 mm long, oval, lower lobe ca. 8 mm long, rounded; stamens 0.8–1 cm, emerging from the median portion of the corolla; filaments 7–9 mm long; anthers basifixed, ca. 1 mm long, cylindrical; gynoecium ca. 1.4

cm long; ovary ca. 2 mm long, pubescent at apex, globose; style ca. 1 cm long; stigma ca. 1 mm long. Drupe ca. 0.7–1.5 cm diam., oblong, glabrous, blackened.

Material examined: BRAZIL, PARAÍBA: Araruna, Parque Ecológico da Pedra da Boca, 6°27'14"S and 35°40'49"W, 237 m, 14.IV.2002, fr., M.R. Barbosa et al 2418 (JPB); Parque Estadual Pedra da Boca, 6°33'30.0"S and 35°44'30.0"W, 570 m, 29.XI.2003, fr., M.C. Pessoa 51 (JPB); Cabaceiras, 7°29'21.0"S and 36°17'14.0"W, 388 m, 25.I.2008, fr., M.C. Pessoa 270 & J.R. Lima (JPB); Gurjão, Rio Soledade, 7°14'48.0"S and 36°29'21.8", 496 m, 25.V.2004, fl., fr., A.V. Lacerda 126 & F.M. Barbosa (JPB); Itabaiana, 7°19'43.0"S and 35°19'57.0"W, 48 m, 26.XI.1971, fr., Academia Brasileira de Ciências 1019 (IPA); Malta, 6°54'16.0"S and 37°31'18.8"W, 267 m, 08.VII.1965, fl., fr., J.S. Sobrinho 69 (IPA); São João do Cariri, Riacho Gangorra, Mata ciliar, 7°23'27.0"S and 36°31'58.1"W, 455 m, 13.III.2003, fr., A.V. Lacerda 53 (JPB); Rio Taperoá, 7°23'27.0"S and 36°31'58.1"W, 455 m, 20.I.2005, fr., A.V. Lacerda 318 (JPB); São José de Espinharas, margem do rio Espinharas, VII.2002, H.S. Xavier (IPA 60308); Sousa, Fazenda Jangada, 6°45'34.0"S and 38°13'41.0"W, 220 m, 08.IX.1994, fl., P.C. Gadelha-Neto et al. 153 (JPB); Vale dos Dinossauros, 6°45'34.0"S and 38°13'41.0"W, 220 m, 28.XII.1999, fr., P.C. Gadelha-Neto 472 (JPB); Tacima, Parque Estadual Pedra da Boca, 6°29'18.0"S and 35°38'13.9"W, 169 m, 08.III.2002, fr., M.F. Agra et al. 5626 (JPB).

Vitex gardneriana is endemic to Brazil and distributed only in the northeastern region (except in Maranhão and Piauí), found in vegetation typical of Caatinga (Harley et al. 2015). Observed flowering in May, July, and September in the study area, and fruiting in January, March, April, May, July, November and December. In Paraíba is found in Caatinga enclaves and riparian forest.

Can be recognized by having leaves simple, decussate, coriaceous, bracts lanceolate, and drupe oblong, glabrous.

7. *Vitex megapotamica* (Spreng.) Moldenke, Amer. J. Bot. 38(5): 327. 1951. Type not designated.

Trees ca. 3 m tall; branches subcylindrical, glabrous, cinereous. Leaves compound, palmate, petiolate; petiole 7.3–9.4 cm long, tomentose; blade tri-pentafoliate; leaflet central 7.7–12.3 × 2.3–3.5 cm, membranaceous, elliptic, apex attenuate or acuminate, margins entire, base cuneate, face adaxial glabrescent, face abaxial lanuginose, lateral leaflets 4.7–7.5 × 1.7–2.4 cm, membranaceous, oblong to obovate, apex acuminate to attenuated, margins entire, base attenuated; petiolules 0.7–1 cm long, tomentose. Inflorescence 0.9–1.2 cm long, axillary dichasial cymes, lax, pedunculate; peduncle 5–9 cm long; bracts ca. 2 mm long, filiform. Flowers short-pedicellate; pedicel 1–3 mm long; calyx ca. 3 mm long, campanulate, short-dentate, externally pubescent, internally glabrous; lacinia ca. 1 mm long, obtuse; corolla 0.6–1.1 cm long, hypocrateriform, blue or lilac-colored, hirsute externally and internally; tube ca. 7 mm long, superior and lateral lobes ca. 3 mm long, obtuse, inferior lobe ca. 5 mm long, rounded; stamens 7–9 mm long., emerging from the median portion of the corolla; filaments 5–7 mm long.; anthers dorsifixed, ca. 1 mm long, cylindrical; gynoecium ca. 1 cm long; ovary ca. 2 mm long, oblong; style ca. 5 mm long; stigma ca. 1 mm long. Drupe, ca. 1.5 cm in dia., globose, black.

Material examined: BRAZIL, PARAÍBA: Teixeira, Alto da Serra de Teixeira, capoeira, 7°12'13.16"S and 37°15'29.07"W, 766 m, fl., 29.XI.1971, D. Andrade-Lima 1078 (MAC).

Additional examined material: BRAZIL, MINAS GERAIS: Carangola, Morro da Torre, 20°43'53.31" S and 42°01'47.73" W, 425 m, fr., 01.I.1998, L.S. Leoni 3878 (RB).

Distributed through Argentina, Brazil, and Paraguay (BFG 2015). In Brazil it's widely distributed throughout northeastern, central-western, southeastern and southern Brazil (Harley et al. 2015). Encountered flowering in November, in Caatinga enclaves.

Vitex megapotamica can be recognized by having axillary dichasia cymes, lax, and flowers short-pedicellate.

8. *Vitex orinocensis* Kunth, Nov. Gen. Sp. 2: 247. 1817 [1818]. Holotype: Venezuela, Apure, Boca do Rio Meta, 1799-1804, *Humboldt & Bonpland 682* (P[00670088]). Figures 4 d-j; 5 c-e

Trees 2–4 m tall; branches subcylindrical to cylindrical, glabrous, longitudinal riflings, cinereous. Leaves compound, trifoliolate, petiolate; petiole 1.3–4.8 cm long, subtetragonal, sulcate, pubescent; central leaflet blades 3.9–7.7 × 1.9–3.2 cm, subcoriaceous, elliptic, apex acuminate, margins entire, base attenuated, face adaxial glabrous, face abaxial pubescent on nerves, central nerve prominent; blades of the lateral leaflets 2.4–5.9 × 1.2–2.8 cm, chartaceous, elliptic, apex acuminate, margins entire, base attenuated; petiolule 0.8–1.4 cm long, pubescent. Inflorescences 5–6 cm long, terminal dichasia, branches divaricate, pedunculate; peduncle 2.5–3.5 cm long, subtetragonal, sulcate; bracts 2–3 mm long, filiform. Flowers 1.4–2.1 cm long, pedicellate; pedicel ca. 3 mm long; calyx 3–5 mm long, campanulate, externally strigose; lacinia ca. 3 mm long, acute; corolla ca. 1.5 cm long, tubular, externally tomentose and internally pubescent, lilac; tube ca. 5 mm long; superior and lateral lobes ca. 5 mm long, obtuse to triangular, inferior lobe ca. 7 mm long, rounded; stamens 0.8–1 cm long, emerging from the distal portion of the corolla; filaments 7–9 mm long; anthers ca. 1 mm long, ovoid, black; gynoecium ca. 6 mm long, ovary ca. 1 mm in dia., globose; style ca. 4 mm long; stigma ca. 1 mm long. Drupe ca. 2 cm diam., ovate to globose, vinaceous.

Material examined: BRAZIL, PARAÍBA: Junco do Seridó, 6°59'48.0"S and 36°42'47.2"W, 592 m, 21.II.1999, fl., C. Schindwein 926 (JPB); Serra Branca, próximo ao rio na base da Pedra Branca, 7°29'00.0"S and 36°39'54.0"W, 493 m, 13.III.2007, fl., M.F. Agra 6763 (JPB); Serra do Jatobá, 7°30'22,86"S and 36°44'05,98"W, 542 m, 29.VI.2016, fl., F.K.S. Monteiro et al. 55 (ACAM); Serra do Jatobá, 7°30'22,86"S and 36°44'05,98"W, 542 m, 27.VIII.2016, fr., Monteiro et al 63 (ACAM).

Vitex orinocensis is widely distributed through South America (Brazil, Colombia, Ecuador, Guiana, French Guiana, Peru, Suriname, and Venezuela) (Macbride 1960). In Brazil is distributed through the northern (Acre, Amazonas, Amapá and Pará), northeastern (Bahia and Maranhão), central-western (Mato Grosso), and southeastern (Espírito Santo), being encountered in Atlantic Forest and Amazonian vegetation (Harley et al. 2015). Was encountered with flowers in February, March, and June in the study area, and with fruits in August. In Paraíba is found in rock outcrop and Caatinga enclaves.

Can be distinguished from the other species of *Vitex* recorded for the study area by having branches with longitudinal rifling, inflorescences in terminal dichasia, with divaricate branches, and vinaceous drupes.

9. *Vitex rufescens* A. Juss., Ann. Mus. Hist. Nat. 7: 77. 1806. Holotype, Brazil, anonymous *s.n.* (P-JU[00675517]) Figures 5 f-h; 6 a-f

Trees ca. 6 m tall; branches tetragonal, pubescent, ferruginous. Leaves compound, trifoliolate, petiolate; petiole 4.6–5.1 cm long, tetragonal, pubescent; central leaflet 8.1–12.4 × 3.4–5.3 cm, chartaceous, obovate, apex acute to obtuse, margins entire, base cuneate, discolor, adaxial face velutine, strongly ferruginous, abaxial face pubescent, rufus to brown; lateral leaflets 6.8–9.8 × 3.1–4.5 cm, chartaceous, oval-elliptic, apex obtuse, margins entire, base cuneate; petiolule 2–5 mm long, pubescent. Inflorescence ca. 4.3 cm long, axillary dichasia cymes, pedunculate; peduncle 2.2–3.9 cm long; bracts 0.5–1 cm long, oval. Flowers 1.1–2 cm long, short-pedicellate; pedicel 3–4 mm long; calyx 6–9 mm long, campanulate, pubescent, marcescent in fruit; lacinia ca. 2 mm long; corolla ca. 1.3–1.7 cm long, tubulose, pubescent externally and internally, purple; tube ca. 6 mm long; superior and lateral lobes ca. 4 mm long, oblong; inferior lobe ca. 7 mm long, patent; stamens 1–1.2 cm long, emerging from the distal third of the corolla; filaments 0.9–1.1 cm long; anthers dorsifixed, ca. 1 mm long, oval; gynoecium ca. 1.4 cm long; ovary ca. 2 mm long, globose, pubescent; style ca. 1.2 cm long, pubescent; stigma ca. 1 mm long. Drupe ca. 1.2 cm long, globose, pubescent.

Material examined: BRAZIL, PARAÍBA: Areia, 6°57'48.0"S and 35°41'29.0"W, 618 m, 01.III.1996, fl., M.R. Barbosa 1496 (JPB); Mata do Pau-Ferro, 6°57'48.0"S and 35°41'30.1"W, 542 m, 15.X.1980, fl., Fevereiro 59 (IPA); Mata do Pau-Ferro, 6°57'48.0"S and 35°41'30.1"W, 543 m, 28.II.2001, fl., fr., I.S. Nascimento (JPB 26552); Bananeiras, *Campus* UFPB, 6°45'00.0"S and 35°37'59.9"W, 556 m, 23.XI.1997, fl., M.R. Barbosa 1672 (JPB); Cabedelo, Mata do Amém, 6°58'52.0"S and 34°50'02.0"W, 3 m, 08.X.1999, fl., A.F. Pontes 217 (JPB); Mata do Amém, 6°58'52.0"S and 34°50'02.0"W, 3 m, 12.XI.1999, fr., A.F. Pontes & M. Costa-Santos 275 (JPB); João Pessoa, Bosque dos Sonhos, 07°08'00"S and 34°47'00"W, 3 m, 08.II.2008, fr., P.C. Gadelha-Neto et al. 2066 (JPB); Cabo Branco, 7°06'54.0"S and 34°51'47.2"W, 41 m, 15.XI.1946, fr., M.C. Espínola (JPB 1318); Cabo Branco, 7°06'54.0"S and 34°51'47.2"W, 41 m, 13.XI.1986, fr., C.A.B. de Mirea 204 (JPB); Lucena, Fazenda N. Senhora da Guia, 7°06'54.0"S and 34°51'47.0"W, 41 m, 11.II.1994, fl., O.T. Moura 1190 (JPB); Lagoa Seca, Sítio Conceição, 7°10'15.35"S and 35°51'57.61"W, 627 m, 01.VII.2016, fr., F.K.S. Monteiro & A.S. Pinto 58 (ACAM); Sítio Conceição, 7°10'15.35"S and 35°51'57.61"W, 627 m, 06.XI.2016, fl., F.K.S. Monteiro & A.S. Pinto 70 (ACAM); Mamanguape, APA de Mamanguape, 6°50'19.0"S and 35°07'34.0"W, 40 m, 13.XII.2007, fr., T.M.G. Veloso (JPB 38486);

Vitex rufescens is endemic to Brazil and is encountered in the northern (Pará), northeastern (except Ceará), central-western (Distrito Federal and Goiás), and southeastern (Espírito Santo and Minas Gerais) regions, associated with Caatinga, Cerrado, and Atlantic Forest vegetation (Harley et al. 2015). It was encountered flowering in February, March, October, and November, and fruiting in February, July, November, and December in anthropized areas and seasonal forests.

Can be distinguished from the other species of *Vitex* encountered in Paraíba State by having branches pubescent, ferruginous, leaflets chartaceous, with the adaxial face strongly ferruginous and axillary dichasia cymes.

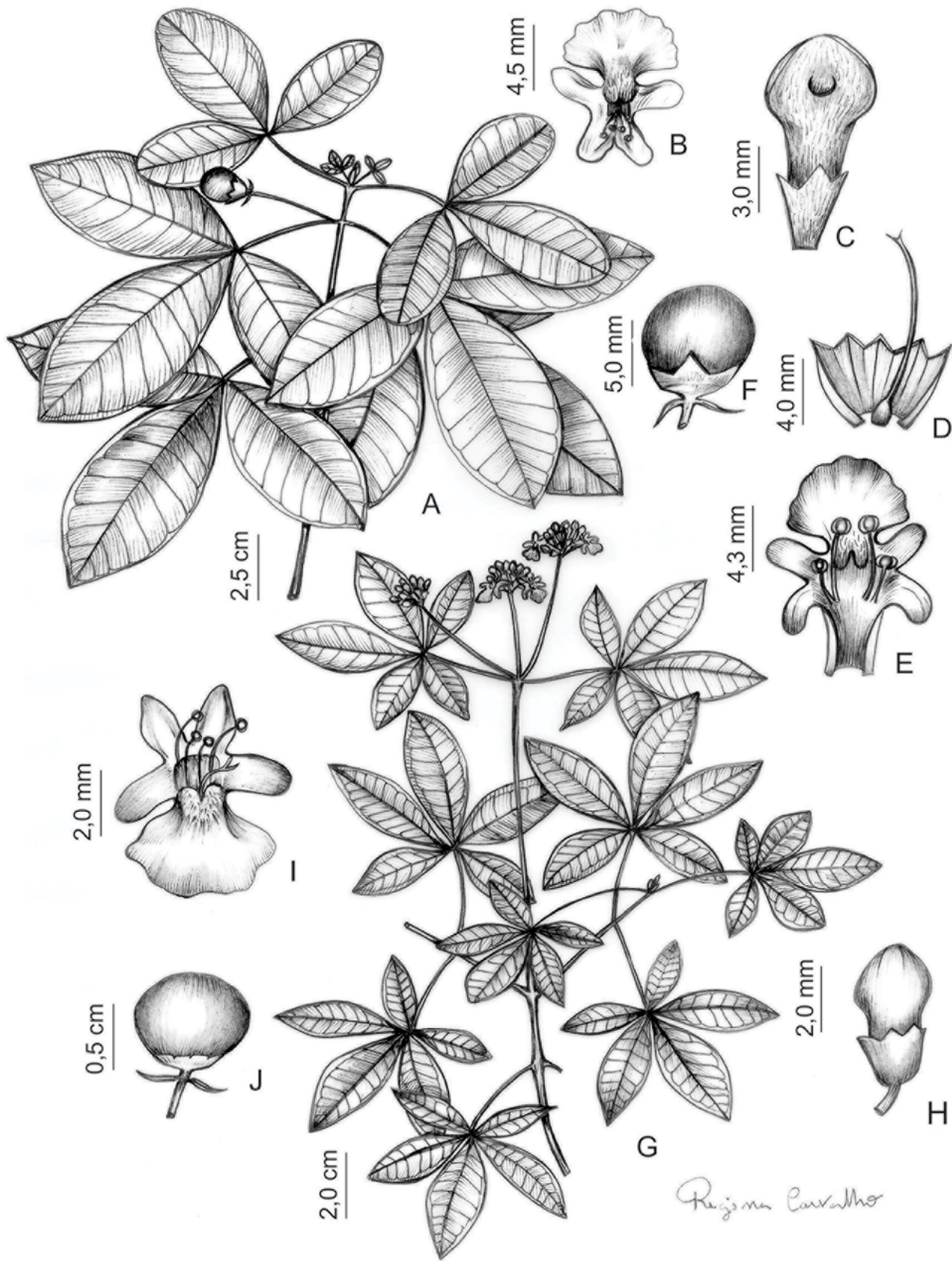


Figure 6. a-f) *V. rufescens*: a) Reproductive branch; b) flower in frontal view; c) floral bud; d) open calyx showing the gynoecium; e) open corolla showing the stamens; f) fruit. g-j) *V. schaueriana*: g) Reproductive branch; h) floral bud; i) flower; j) fruit. a-f) Monteiro & Pinto 58, 70; g-j) Leoni 7656.

10. *Vitex schaueriana* Moldenke, Revista Sudamer. Bot. 5: 3. 1937. ≡ *V. montevidensis* var. *parviflora* Schauer, in De Candolle. Prodr 11: 689. 1847. Lectotype (designated by França 2010): Brasil, Bahia, Serra de Açuruá, 1839, *J.S. Blanchet 2782* (W[18890121062], W[0022937], isoelectotypes BM, BR, E, G, K, LD, NY). Figure 6 g-j

Trees 2–5 m tall; branches subcylindrical, glabrous, cinereous. Leaves opposite, compound, 5-foliolate, petiolate; petiole 2.1–3.8 cm long, tomentose; central leaflet 3.4–6.1 × 1.4–2.1 cm, chartaceous, obovate, ovate to elliptic, discolor, apex acute, base cuneate, margins entire, face abaxial glabrous with few trichomes on the principle nerve, face adaxial glabrous; lateral leaflets 3.5–4.3 × 1.3–1.6 cm, oval-elliptic, chartaceous, apex acute, margins entire, base cuneate; petiolules 2–4 mm long, tomentose. Inflorescence 3.7–7.8 cm long, dichasia simple, axillary, pedunculate; peduncle 2.3–4.8 cm long; bracts 3–5 mm long, oval; bracteoles 2–3 mm long, lanceolate. Flowers 0.9–1.1 cm long, short-pedicellate; pedicel ca. 2 mm long; calyx 2–5 mm long, campanulate, subtruncate, pubescent; lacinia ca. 2 mm long, acute; corolla 1.1–1.3 cm long, externally and internally pubescent, purple; tube ca. 5 mm long; superior and lateral lobes ca. 2 mm long, stamens 0.9–1.2 cm long, emerging from the distal third of the corolla; filaments 0.7–1 cm long; anthers ca. 2 mm long, dorsifixed, oval; gynoecium ca. 1.2 cm long; ovary ca. 2 mm long, globose; style ca. 8 mm long; stigma ca 2 mm long. Drupe 4–9 mm long, elliptic, brown.

Material examined: BRAZIL, PARAÍBA: São João do Cariri, Riacho Aveloz, 7°22'00.97"S and 36°31'58.95"W, 488 m, 19.I.2005, fl., A.V. Lacerda 303 & F.M. Barbosa (JPB); São José dos Cordeiros, RPPN Fazenda Almas, 7°17'31.6"S and 36°33'13.0"W, 531 m, 16.II.2003, fr., M.R. Barbosa 2684 (JPB);

Species endemic to Brazil, encountered in the northern (Bahia, Ceará, Maranhão, Paraíba and Piauí) and southeastern (Minas Gerais) regions, associated with Caatinga, Cerrado, Amazonian vegetation and Atlantic Forest (Harley et al. 2015). Flowering occurs in January, and fruiting in February in Caatinga areas.

Vitex schaueriana can be recognized principally by having glabrous branches, 5-foliolate leaves, and oval bracts.

Supplementary Material

The following online material is available for this article:
Appendix

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Author Contributions

Fernanda Kalina da Silva Monteiro and José Iranildo Miranda de Melo: provided substantial contribution in the concept and design of the study;

Fernanda Kalina da Silva Monteiro, José Floriano Barêa Pastore and José Iranildo Miranda de Melo: provided contribution to data collection;

Fernanda Kalina da Silva Monteiro, José Floriano Barêa Pastore and José Iranildo Miranda de Melo: provided contribution to data analysis and interpretation;

Fernanda Kalina da Silva Monteiro, José Floriano Barêa Pastore and José Iranildo Miranda de Melo: have contributed to manuscript preparation and to critical revision, adding intellectual content.

Conflicts of interest

The authors declare no conflicts of interest related to the publication of this manuscript.

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