



The tribes Acacieae and Ingeae (Leguminosae: Caesalpinioideae) in the Environmental Protection Area Serra Branca, Raso da Catarina, Jeremoabo, Bahia, Brazil

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Abstract: Leguminosae includes six subfamilies, where the traditionally recognised subfamily Mimosoideae was accepted as a distinct clade included within the recircumscribed subfamily Caesalpinioideae, called informally as Mimosoid clade. The representatives of the tribes Acacieae and Ingeae can be differentiated principally in terms of the patterns of their stamens, being free in Acacieae and monadelphous in Ingeae. The floristic survey of Acacieae and Ingeae in the Environmental Protection Area Serra Branca included analysis of specimens collected from June 2011 to September 2012. The analyses were supplemented with dried collections from the following herbaria: ALCB, HRB and HUEFS. Ten species were cataloged, distributed among four genera of Ingeae: *Calliandra* Benth. (1 sp.), *Chloroleucon* (Benth.) Britton & Rose ex Record (1 sp.), *Enterolobium* Mart. (1 sp.), *Pithecellobium* Mart. (1 sp.); and one genus of Acacieae: *Senegalia* Raf. (6 spp.). The most representative species were *Calliandra aeschynomoides* Benth. associated with sandy and stony soils and *Chloroleucon foliolosum* (Benth.) G.P.Lewis and *Senegalia bahiensis* (Benth.) Seigler & Ebinger growing on sandy-clay soils. The taxonomic treatment includes a key for the identification, descriptions, illustrations, photos, data of the geographical distribution phenological data and comments about the species.

Keywords: Biodiversity, Caatinga, Fabaceae, Floristics, Mimosoids clade.

As tribos Acacieae e Ingeae (Leguminosae: Caesalpinioideae) na Área de Proteção Ambiental Serra Branca, Raso da Catarina, Jeremoabo, Bahia, Brasil

Resumo: Leguminosae inclui seis subfamílias, onde a tradicional subfamília Mimosoideae foi reconhecida como um clado distinto dentro da recircunscrita subfamília Caesalpinioideae, chamado de clado Mimosoideae. Os representantes das tribos Acacieae e Ingeae podem ser diferenciadas principalmente pelo padrão dos estames, sendo livres em Acacieae e monoadelfos em Ingeae. O levantamento florístico de Acacieae e Ingeae na Área de Proteção Ambiental Serra Branca compreendeu análises de espécimes coletados no período de junho 2011 a setembro 2012. As análises foram complementadas com coleções herborizadas depositadas nos seguintes herbários: ALCB, HRB e HUEFS. Foram catalogadas dez espécies, distribuídas em quatro gêneros de Ingeae: *Calliandra* Benth. (1 sp.); *Chloroleucon* (Benth.) Britton & Rose ex Record (1 sp.); *Enterolobium* Mart. (1 sp.) e *Pithecellobium* Mart. (1 sp.), e um gênero de Acaciae: *Senegalia* Raf. (6 spp.). As espécies mais representativas foram *Calliandra aeschynomoides* Benth. associada a solos arenoso-pedregosos e *Chloroleucon foliolosum* (Benth.) G.P.Lewis e *Senegalia bahiensis* (Benth.) Seigler & Ebinger a solos arenoso-argilosos. O tratamento taxonômico inclui uma chave de identificação, descrições, ilustrações, fotos, dados de distribuição geográfica, dados fenológicos e comentários sobre as espécies.

Palavras-chave: Biodiversidade, Caatinga, Fabaceae, Florística, clado Mimosoideae.

Introduction

Leguminosae Juss. (Fabaceae) is considered the third largest family of Angiosperms, with approximately 760 genera and about 19,500 species (LPWG 2017). In Brazil, 223 genera and 2,848 species were recorded to Leguminosae, which is one of the most representative families in the Caatinga, including 611 species (Flora do Brasil 2020). According to the new classification, its species are distributed into six subfamilies, namely Caesalpinioideae DC, Cercidoideae LPWG, Detarioideae Burmeister, Dialioideae LPWG, Duparquetioideae LPWG and Papilionoideae DC. The traditionally recognised subfamily Mimosoideae was accepted as a distinct clade included within the circumscribed subfamily Caesalpinioideae, called informally as Mimosoid clade (LPWG 2017).

Mimosoid clade have a pantropical distribution and is more common in rain forests, dry savannas, and desert areas (Richardson et al. 2001, Ratter et al. 2003, Schrire et al. 2005, LPWG 2017) The clade includes four tribes: Acacieae Dumort., Ingeae Benth., Mimoseae Bronn and Mimozygantheae Burkart. (Lewis et al. 2005). The representatives of the tribes Acacieae and Ingeae can be differentiated principally in terms of the patterns of their stamens, being free in Acacieae and monadelphous in Ingeae (Vassal 1981).

According to a newly proposed circumscription, the tribe Acacieae includes seven lineages that are treated as genera: *Acacia s.s.*, *Acaciella* Britton & Rose, *Mariosousa* Seigler & Ebinger, *Parasenegalia* Seigler & Ebinger, *Pseudosenegalia* Seigler & Ebinger, *Senegalia* Raf., and *Vachellia* Wight & Arnott, and about 1,381 species (Orchard & Maslin 2003, Brown et al. 2008, Seigler et al. 2017). Among the currently recognized genera, only *Parasenegalia*, *Senegalia* and *Vachellia* are registered to Brazil (Seigler et al. 2017, Seigler & Ebinger 2018, Flora do Brasil 2020), with about 63 species of which 17 occur in the Caatinga biome (Queiroz 2009, Morim & Barros 2012, Terra & Garcia 2016, BFG 2018, Flora do Brasil 2020).

The tribe Ingeae comprises 37 genera with 966 species (including recent described: *Afrocalliandra* E.R.Souza and *Sanjappa* E.R.Souza & M.V.Krishnaraj), with two centers of diversity: one in Central and South America, and a second in southeastern Asia and Australia (Lewis & Rico-Arce 2005, Brown et al. 2008, Souza et al. 2016). Ingeae is represented in Brazil by 15 genera with 391 species (Lima et al. 2012) of which 10 genera and 73 species occur in the Caatinga (Queiroz 2009, Flora do Brasil 2020).

The Caatinga has a high rate of endemism and diversity, making a better understanding of its flora necessary for proper conservation measures (Prado 2003). However, Caatinga is probably the most undervalued and poorly known botanically biome (Giulietti et al. 2002), yet it has the lowest number of conservation units and is one of the least protected in Brazil (Leal et al. 2005). Currently the Caatinga has 180 protected areas, which protect 9% of the biome, and 1,8% of this protected area belongs to the category of integral protection, 7,2 % to sustainable use (CNUC/MMA 2018).

The Environmental Protection Area Serra Branca, Raso da Catarina (EPASB) is located in the municipality of Jeremoabo in Northeastern Bahia fully inserted into the “polígono das secas” (Fundação CTI/NE 2016). In the floristic surveys carried out in EPASB were cataloged 11 species to Bignoniaceae (Silva et al. 2016), 10 species

to Boraginaceae (Vieira et al. 2013), 23 species to Euphorbiaceae (Lopes 2012), 16 species to Malvoideae-Malvaceae (Lima & Conceição 2016), 11 species to *Mimosa* L. (Dourado et al. 2013), four species to Passifloraceae (Santos et al. 2016), and 21 species to Rubiaceae (Varjão et al. 2013).

Studies on taxa of Mimosoid clade in areas of Caatinga in Bahia are few. Given the significant rate of endemism and diversity for the Caatinga biome, and the limited number of surveys for the clade therein, this study aimed to contribute to a better understanding of the Mimosoid clade in the EPASB, in order to contribute to knowledge about the flora of the semiarid region of Bahia, as well as to support the development of the area’s management plan.

Materials and Methods

1. Study area

The Environmental Protection Area Serra Branca, Raso da Catarina (EPASB, Figure 1) comprises 67,237 ha., located in the municipality of Jeremoabo in Northeastern Bahia fully inserted into the “polígono das secas” (Fundação CTI/NE 2016), delimited by the coordinates 09°53’15.5” to 09°44’34.6”S and 38°49’36.1” to 38°52’20.4”W, limited to the South with the Vaza-Barris River and North to the Ecological Station Raso da Catarina (ESEC). The predominant vegetation is the sandy, very dense bushy Caatinga. The climate of the Ecoregion is semiarid, with average rainfalls of 500 mm/year and annual temperature is approximately 23°C (Szabo et al. 2007). The soils are generally sandy deep and very fertile relief plan with sandstone formations (Velloso et al. 2002).

2. Taxonomic study

The study was based on fieldwork carried in the period from June 2011 to September 2012, besides information complemented by the analysis of specimens deposited in the following herbaria: ALCB, HRB, and HUEFS, acronyms according to Thiers 2018 (continuously updated; Appendix 1). The field collections and observations were performed during random walks exploring most of the study area. The herborization and material processing followed the methodology by Fosberg & Sachet (1965) and Mori et al. (1989), where fertile material was collected with flowers and/or fruit. Observations were made about the distribution of the species and the type of soil (Tricart 1972, Sampaio 1995). The specimens were deposited in the herbarium of the State University of Bahia (HUNEB – Paulo Afonso Collection) and the duplicates will be sent to the main herbaria in the state of Bahia (ALCB, HRB and HUEFS).

The identifications were made based mainly on specialized bibliographies, protologues, photos of type collections and comparison of the collections in the visited herbaria. For the taxonomic descriptions, the terminologies proposed by Mesquita (1990), Barneby & Grimes (1996), Barneby & Grimes (1997), Barneby (1998), Harris & Harris (2001), Seigler et al. (2006), and Melo et al. (2010) were adopted. The inflorescences were measured considering principally the stamens. The taxonomic treatment includes an identification key, descriptions, illustrations, photos, data of the geographical distribution, phenological data and comments about the species.

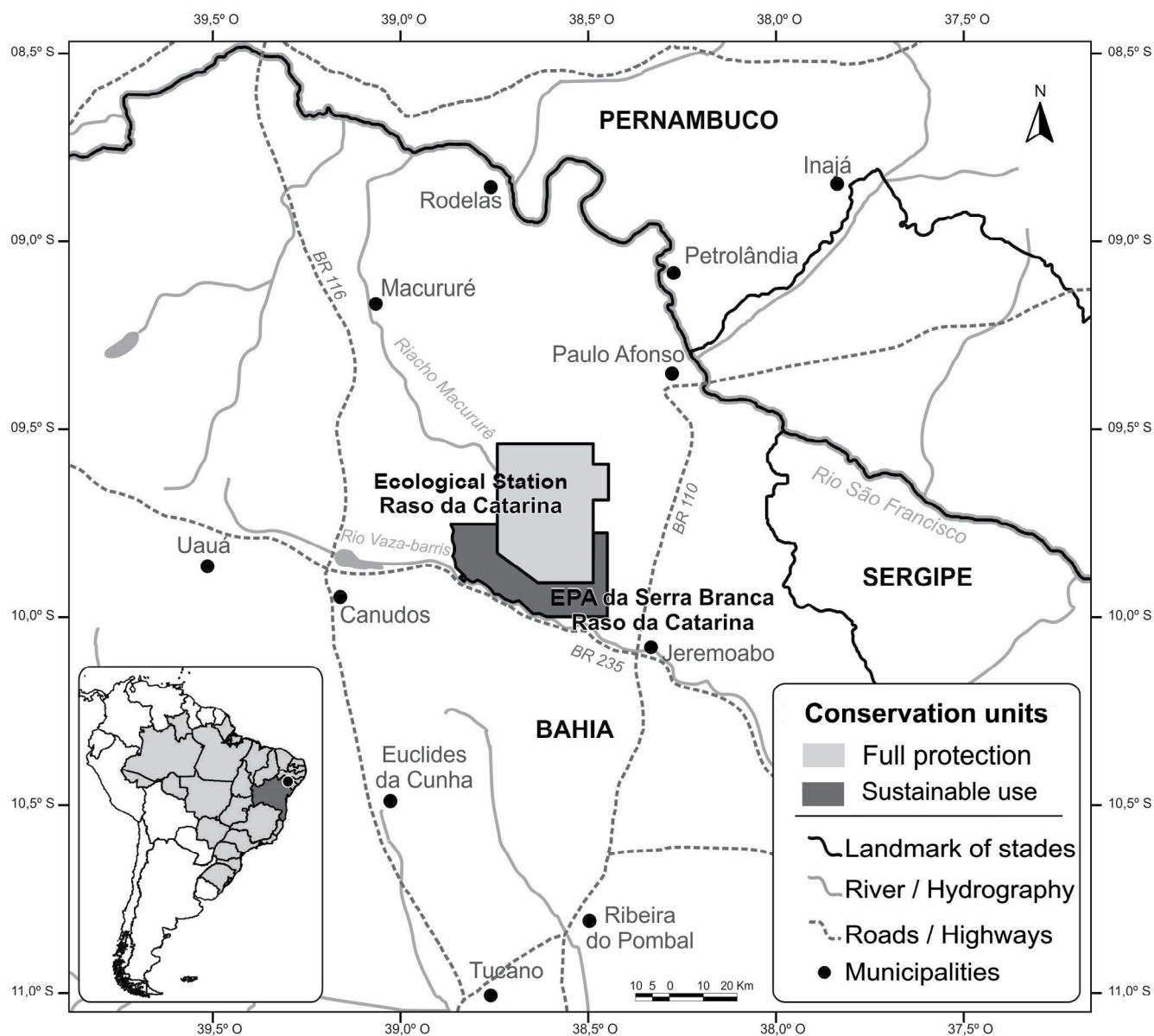


Figure 1. Location of the EPA Serra Branca/Raso da Catarina, Bahia, Brazil (Varjão et al. 2013).

Results

Ten taxa were recorded for the tribes Acacieae and Ingeae in the EPASB (Figure 2). For the Acacieae, six species of the genus *Senegalia* were cataloged: *S. bahiensis* (Benth.) Seigler & Ebinger, *S. piauhiensis* (Benth.) Seigler & Ebinger, *S. limae* (Bocage & Miotto) L.P. Queiroz, *S. globosa* (Bocage & Miotto) L.P. Queiroz, *S. polyphylla* (DC.) Britton & Rose, and *S. tenuifolia* (L.) Britton & Rose. For the Ingeae, four genera were recorded, with only one species each: *Pithecellobium diversifolium* Benth., *Chloroleucon foliolosum* (Benth.) G.P. Lewis, *Calliandra aeschynomoides* Benth., and *Enterolobium timbouva* Mart.

The species in the EPASB are distributed throughout the subshrub to arboreal caatinga vegetation in well-preserved areas and in anthropogenically modified zones growing on sandy, sandy-stony, or sandy-clayey soils. The most representative species were *Calliandra aeschynomoides*, *Chloroleucon foliolosum*, and *Senegalia bahiensis*. *Calliandra aeschynomoides* occurs in fragments of the EPASB,

associated with shrub vegetation on sandy-stony soils. *Chloroleucon foliolosum* and *S. bahiensis* are associated with shrub to arboreal caatinga vegetation occurring on sandy-clayey soils. The diagnostic morphological characters used to identify these taxa in the area were: the presence or absence of prickles, spines, the shapes of the stipules, numbers of leaflet pairs; shapes and locations of the extrafloral nectaries, inflorescence patterns, and types of fruits.

1. Tribe Acacieae Benth

Trees, small trees, or shrubs. Branches with or without prickle. Stipules not spiny, foliaceous, cordiform, oval, lanceolate or filiform. Leaves bipinnate, pinnae 2-11 pairs, leaflets 8-31 pairs. Extrafloral nectaries elevated, globose, concave, estipitate cylindrical, caliciform or conical. Inflorescences in spikes or in panicle homomorphic. Flowers sessile, stamens polystamenous, free. Fruit chartaceous, dehiscent, linear.

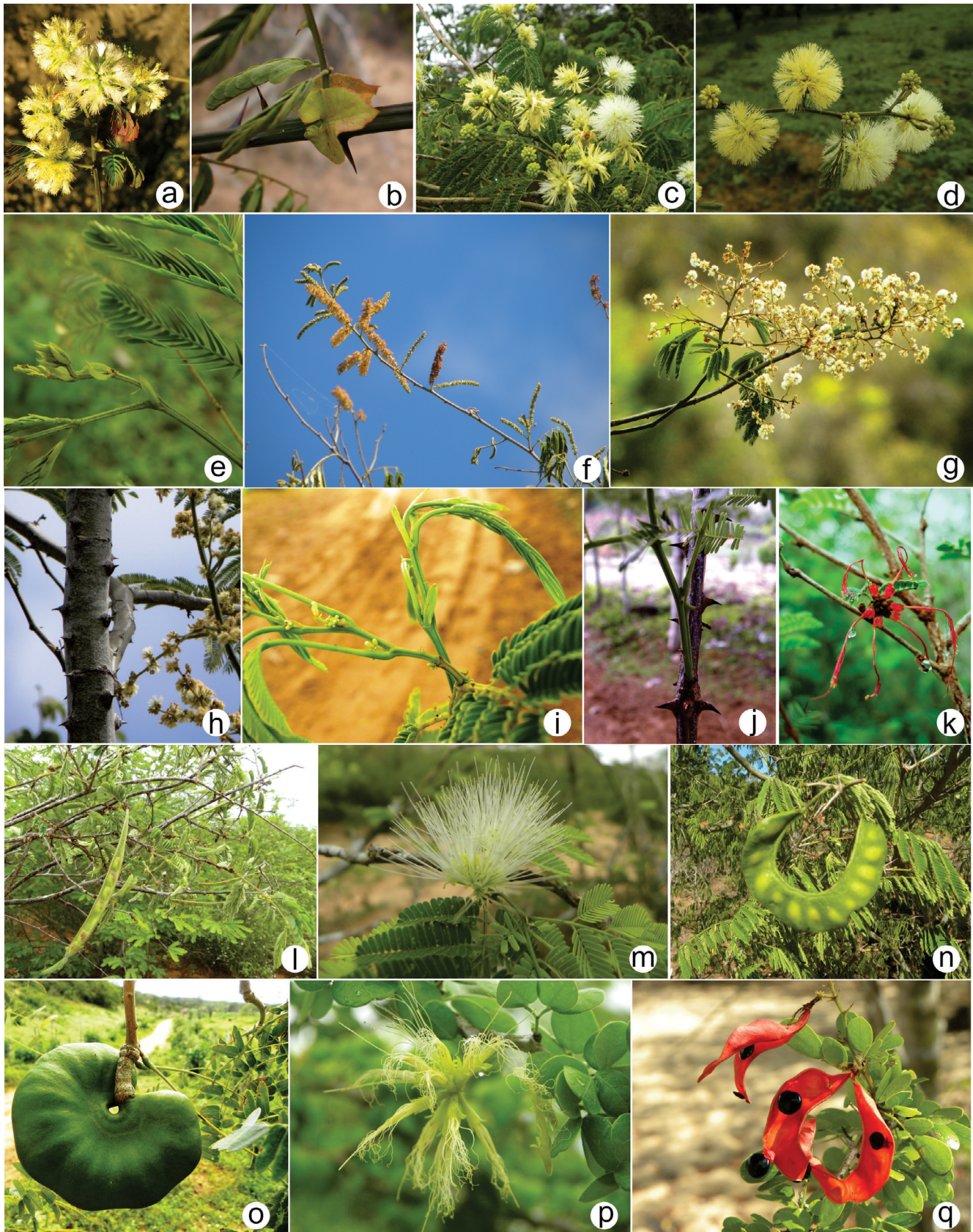


Figure 2. Representatives of the Tribes Acacieae and Ingeae in the EPASB. a-j. Acacieae: a-b. *Senegalia bahiensis*. c. *Senegalia globosa*. d-e. *Senegalia limae*. f. *Senegalia piauiensis*. g-h. *Senegalia polyphylla*. i-j. *Senegalia tenuifolia*. k-q. Ingeae: k-l. *Calliandra aeschynomenes*. m-n. *Chloroleucon foliolosum*. o. *Enterolobium timbouva*. p-q. *Pithecellobium diversifolium*.

2. Tribe Ingeae Benth

Trees, small trees, shrubs or subshrubs. Branches with or without prickle. Stipules spiny (transformed into spines) or foliaceous, oval to lanceolate. Leaves 1-6 pairs of pinnae, leaflets 1-24 pairs. Extrafloral nectaries present or (rarely) absent (only in *Calliandra* Benth.). Inflorescences in homomorphic or heteromorphic glomerules; when heteromorphic, central flower differentiated with long perianth, showing greatly exerted stamens. Flowers sessile or pedicellate, stamens polystamenous, monadelphous. Fruit chartaceous or coriaceous indehiscent or dehiscent, linear, oblanceolate, linear flat to curved 90° to 360°, auriculate, linear spiraled.

Identification key for the representatives of the Acaciae and Ingeae in the EPASB

1. Extrafloral nectaries absent on the petiole and/or leaf rachis, flowers red-vinaceous 1. *C. aeschynomoides*
- 1'. Extrafloral nectaries present on the petiole and/or leaf rachis, flowers greenish white, green, white, light green, cream-colored.
 2. Flowers with stamens monadelphous.
 3. Branches with nodal paired and isolated spines; dormant buds perulate; glomerules heteromorphic 2. *Ch. foliolosum*
 - 3'. Branches unarmad sometimes with stipules spiny; dormant buds absent; glomerules homomorphic.
 4. Stipules foliaceous, caducous; leaves 2-4 pairs of pinnae; petiole cylindrical, furrow absent; corolla campanulate, glabrous, apices of the lacinias pubescent; fruit indehiscent, auriculate 3. *E. timbouva*
 - 4'. Stipules spiny and persistent; leaves 1-2 pairs of pinnae; petiole sulcate; corolla infundibuliform villous, lacinias villous; fruit dehiscent, sigmoidal 4. *P. diversifolium*
 - 2'. Flowers with stamens free.
 5. Branches slightly angular.
 6. Prickle straight or incurvate; stipules foliaceous, cordiform, to oval, 8-9 mm long 5. *S. bahiensis*
 - 6'. Prickle recurved; stipules linear, lanceolate, oval, 2.5-6 mm long.
 7. Petiole 12-17 mm long; extrafloral nectaries cylindrical or conical; glomerules 17-22 mm diam.; flowers 11-12 mm long 6. *S. globosa*
 - 7'. Petiole 3-5 mm long; extrafloral nectaries globose, concave, estipitate cylindrical, caliciform or conical; glomerules 25-30 mm diam.; flowers 16-18 mm long 7. *S. limae*
 - 5'. Branches cylindrical.
 8. Leaves 2-4 pairs of pinnae; extrafloral nectaries sessile elevated-concave to enclosed- concave inflorescences in spikes 8. *S. pauhiensis*
 - 8'. Leaves 6-11 pairs of pinnae, extrafloral nectaries elevated-concave to short stipitate; inflorescences in panicle.
 9. Branches not lenticular; prickle incurvate not forming in triplets in the nodal region, midrib with a tuft of trichomes at the base of the abaxial face 9. *S. polyphylla*
 - 9'. Branches lenticular; prickle recurved, in triplets in the nodal region, midrib with a tuft of trichomes at the base of the abaxial face absent 10. *S. tenuifolia*

1. *Calliandra aeschynomoides* Benth., Flora Brasiliensis 15(3): 415. 1876. Figures 2k-l; 3a-d.

Subshrub to shrub 1.2-2 m tall. Branches cylindrical, unarmed, grayish, pubescent. Tector trichomes distributed on the branches, stipules, petioles, leaf rachis, leaflets, peduncles, bracts, calyx, corolla, ovaries, and fruits. Buds not observed. Stipules persistent 3-6.5 × 1-1.5 mm, foliaceous, oval to lanceolate, striated, glabrescent. Extrafloral nectaries absent. Leaves with 1 pair of pinnae; petiole 0.5-1.5 cm long, subcylindrical, pilous; rachis 0.5-1 mm long, cylindrical, villous, unarmed; paraphylls absent; leaflets 7-14 pairs, 5-11 × 1.5-4 mm, chartaceous, discolorous, oblong-elliptic, apices acuminate, base oblique, margins entire, adaxial face glabrous, abaxial face pilous; venation campylodromous-brochidodromous, midrib exerted. Homomorphic glomerules axillary, isolated, rarely opposite, 6-9 mm diam.; peduncle 4-6 mm long, sulcate, villous; bracts 2.5-5 mm long, persistent, striated, adaxial face glabrous, abaxial face glabrescent. Flowers 15-20.5 mm long, pentamerous, polystamenous, sessile, 13-16 per inflorescence; calyx 1.5-2.0 mm long, campanulate, striated, vinaceous, pubescent; lacinias ca. 0.5 mm long, erect, striated; corolla 3-3.5 mm long, campanulate, striated, red-vinaceous, pubescent; lacinias 1-1.5 mm long, erect, striated; stamens, filaments 2-4.5 mm long, red; stamen tube 12-15 mm long, exerted; style 15-20 mm long, red; ovary 1.5-2 mm long, sessile, red-vinaceous, glabrescent. Fruits dehiscent, 3.5-6.2 × 0.4-0.5 cm, linear, apices acuminate, base acute stipitate, coriaceous, villous. Seeds 5.5-6.5 × 2.5-3 mm, green, oval to elliptic.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, Baixão do Araçá, 8/V/2008, fl., M.V. Romão 133 (HUNEB); Estrada sentido ESEC Raso da Catarina, próximo ao povoado Quelés, 16/VI/ 2011, fl., A.F.S. Brito 131 (HUNEB); Estrada de acesso ao povoado Quelés, sentido ESEC Raso da Catarina, 28/VII/2009, fl., fr., A.S. Conceição 1772 (HUNEB); Fazenda Serra Branca, trilha da coleta, 19/IV/2008, fl., A.S. Conceição 1376 (HUNEB); Estrada sentido Vaca Morta, 4/XI/ 2011, fl., A.F.S. Brito 40 (HUNEB).

2. *Chloroleucon foliolosum* (Benth.) G.P.Lewis, Legumes of Bahia: 166.1987. *Pithecellobium foliolosum* Benth., London J. Bot. 3: 223.1844. Figures 2m-n; 3 e-j.

Shrub to tree 1.5-6 m tall. Branches cylindrical, flexuous, armed with nodal spines, brown to grayish, lenticular, glabrous to glabrescent. Tector trichomes distributed on the branches, petioles, leaf rachis, leaflets, and peduncles. Spines 10-13 mm long, straight, isolated or paired, glabrescent when young. Buds 1.5-2 mm long, striated, perulate, dormant. Stipules caducous, not observed. Extrafloral nectaries 0.5-1 mm long, elevated to short stipitate, caliciform to cylindrical, located on the petiole and rachis, between the last three pairs of pinnae and the distal leaflet pairs. Leaves with 5-6 pairs of pinnae, displayed on short lateral branches; petiole 1-1.5 mm long, flat, oblong, villous; rachis 2-3.5 mm long, sulcate, glabrescent; rachis segments 5-10 mm long; paraphylls absent; leaflets 13-24 pairs, 3-5.5 × 1-1.5 mm, chartaceous, discolorous, linear, falcate, apices acute, base oblique, margins entire; glabrous to pubescent; venation campylodromous-brochidodromous, midrib sub-centric. Glomerules heteromorphic, axillary, isolated or in pairs in the leaf axils, 20-25 mm diam., peduncle 11-17 mm long, sulcate, glabrous; bracts 2-3.5 mm long, caducous,

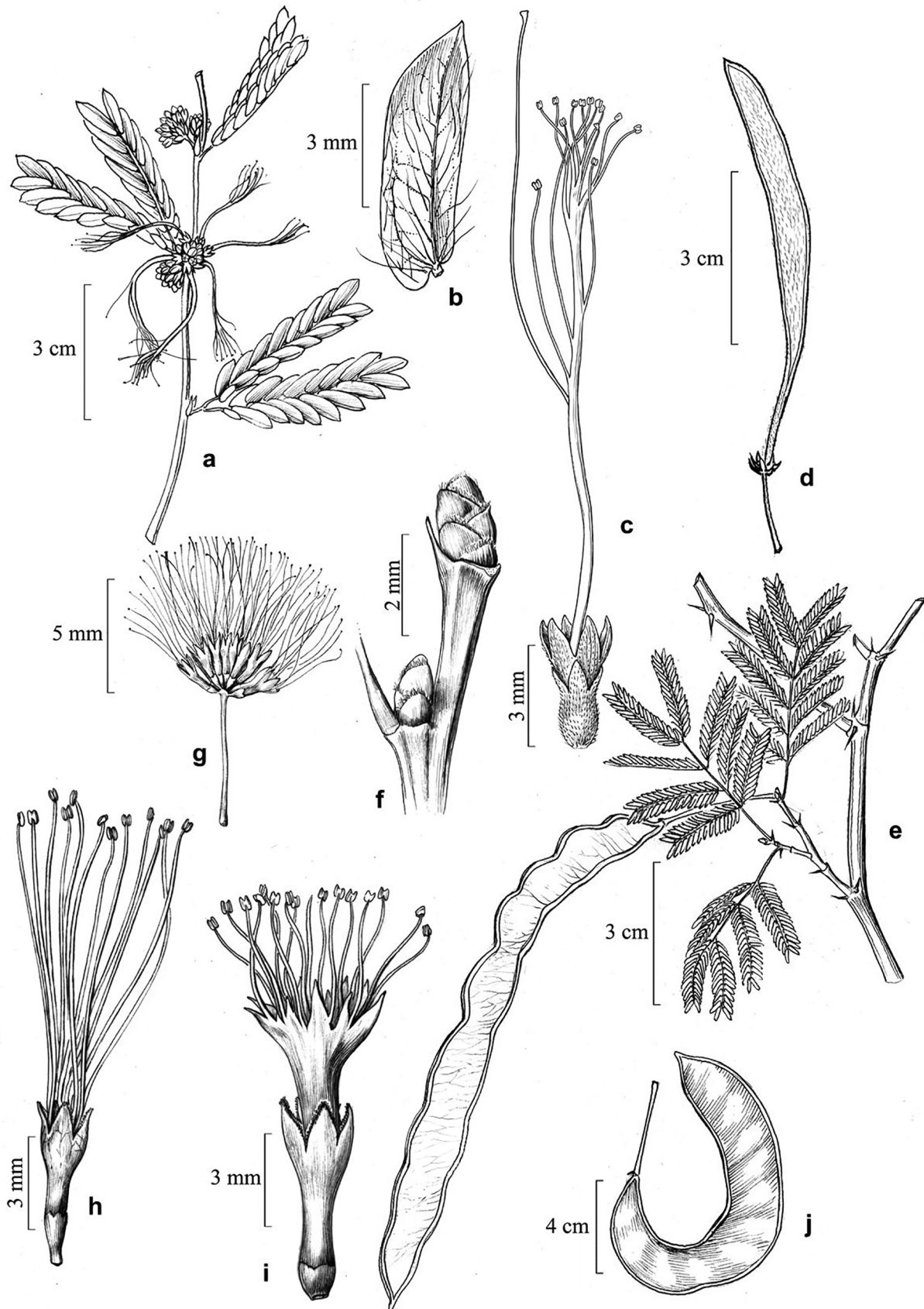


Figure 3. a-d. *Calliandra aeschynomoides*. a. flowering branch; b. leaflet, abaxial surface; c. flower; d. fruit. e-j. *Chloroleucon foliolosum*. e. fruiting branch showing leaves and nodal thorns; f. gems; g. glomerulus; h. peripheral flower; i. central flower; j. fruit. a-d from A. F. S. Brito 13; e-j from A. F. S. Brito 33.

slightly striated, margins pubescent. Flowers peripheral 17–18.5 mm long, pentamerous, subsessile, 10–22 per inflorescence, calyx 1.5–2 mm long, infundibuliform to campanulate, greenish white, glabrous; lacinias small ca. 1 mm long; corolla 4–5.5 mm long, infundibuliform, greenish white, glabrous; lacinias 1–1.5 mm long, erect, margins ciliate; stamens monadelphous, filaments 11–12 mm long, white; stamen tube 2–2.5 mm long (peripheral flowers), style 14–15 mm ovary 1.8–2 mm long, subsessile, glabrous. Central flowers 18–19 mm long, pentamerous, sessile, 1–2 per inflorescence; calyx 1.0–1.5 mm long, infundibuliform to campanulate, greenish white, glabrous; lacinias small 1–1.2 mm long; corolla 5–6 mm long, infundibuliform, greenish white, glabrous; lacinias 1–1.5 mm long, erect, margins ciliate; stamens enclosed within the corolla, 9–11 mm long, exerted, dilated and fimbriate at apex; style 17–17.5 mm long, white; ovary ca. 2 mm long, subsessile, glabrous. Fruits indehiscent 11–28 cm long, coriaceous, glabrous, linear, flat to curved 90° to 360°, apices acute to obtuse, base cuneate, margins thickened this, slightly undulating, valves fleshy, extending over the seeds. Seeds 5–6 mm long, greenish gray, oval.

Materials examined: BRAZIL. BAHIA: Jeremoabo, Faz. Serra Branca, estrada sentido Serra do Navio, 03/XI/2011, fl., fr., A.F.S. Brito 33 (HUNEB); 03/XI/2011, fl., fr., A.F.S. Brito 32 (HUNEB); 03/XI/2011, fl., fr., A.F.S. Brito 34 (HUNEB); Serra do Navio, Caminho da Judite, 03/XI/2011, fl., fr., A.F.S. Brito 29 (HUNEB); Trilha em direção ao Saco da Onça, 30/VII/2009, fl., fr., A.S. Conceição 1823 (HUNEB); Trilha sentido Serra do Navio, 31/VII/2009, fl., fr., A.S. Conceição 1881 (HUNEB); Vaca Morta, 22/VIII/2008, fl., M.V. Romão 267 (HUNEB); 17/IX/2009, fl., fr., M.V. Romão 304 (HUNEB); 17/IX/2009, fl., M.V. Romão 469 (HUNEB).

3. *Enterolobium timbouva* Mart., Flora 20 II. Beibl. 128.1837. Figures 2o; 4a-d.

Tree 8–10 m tall. Branches cylindrical, unarmed, grayish, lenticular, glabrous. Tector trichomes distributed on the peduncles and lacinias of the calyx and corolla. Buds no observed. Stipules caducous, 0.5–1 mm long, foliaceous, linear, glabrous. Extrafloral nectaries 1–1.5 × ca. 0.5 mm, elevated, cylindrical to elliptic, located on the petiole below the basal pair of pinnae, additional nectaries below the leaflet pairs. Leaves with 2–4 pairs of pinnae; petiole 4.4–8.3 cm long, cylindrical, furrow absent, glabrous; rachis 5.8–12.8 cm long, cylindrical, costate, glabrous to glabrescent; rachis segments 13–22 mm long; paraphylls short or vestigial; 9–11 leaflet pairs, 20–25 × 8–10 mm, chartaceous, discolorous, oblong, slightly falcate, apices apiculate, base oblique, margins entire, glabrous to sericeous; venation campylodromous-brochidodromous, midrib exerted. Homomorphic glomerules united in axillary bundles, 20–25 mm diam.; peduncle 1.8–5 mm long, cylindrical, sulcate, villous; bracts c. 2 mm, caducous, oval, glabrous. Flowers 12–16 mm long, pentamerous, subsessile, c. 25 flowers per inflorescence; calyx 4.5–5 mm long, tubular to slightly campanulate, green, glabrous; lacinias 1–2 mm long, apices pubescent; corolla 7.5–8.5 mm long, campanulate, green, glabrous, lacinias 2–3 mm long, apices pubescent; stamens monadelphous, filaments 14–15 mm long, whitish; stamen tube 7–9 mm long, exerted; style 14–15.5 mm long, whitish; ovary 2–2.5 mm long, stipitate, glabrous, stipe c. 5 mm long. Fruits indehiscent 11.5–3.6 × 3.2–5.7 cm, auriculate, stipitate, blackish when mature, coriaceous, glabrous, oblong, curved. Seeds not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, caminho da ESEC em direção ao Povoado Quelés, 09/12/2009, fl., D.D. Vieira 56 (HUNEB); Estrada ca. 200 m do Povoado Quelés, 26/III/2012, fl., A.F.S. Brito 44 (HUNEB); Estrada principal sentido Povoado Quelés, próximo a roça com bebedouro, 16/VI/2011, fr., A.F.S. Brito 17 (HUNEB); Estrada do Tamburi, 14/V/2012, fr., A.F.S. Brito 55 (HUNEB).

4. *Pithecellobium diversifolium* Benth., London J. Bot. 3: 201. 1844. Figures 2p-q; 4e-h.

Tree ca. 5 m tall. Branches cylindrical, flexuous, grayish, lenticular, glabrous. Spines absent. Tector trichomes distributed on the petioles, leaf rachis, leaflets, peduncles, bracts, calyx, corolla, and ovaries. Buds not observed. Stipules spiny, persistent, 5–20 mm long, glabrous. Extrafloral nectaries ca. 0.5 mm long, elevated, cylindrical, located on the rachis, between each pair of pinnae and the on the pair of leaflets. Leaves with 1–2 pairs of pinnae; petiole 2–10 mm long, sulcate, winged, pubescent; leaf rachis 2–10 mm long, cylindrical, canaliculate, pubescent; rachis segments 3–5 mm long; paraphylls absent; leaflets 1–2 pairs, 1–2 × 0.5–0.9 cm, chartaceous to subcoriaceous, discolorous, elliptic to oval, apices retuse to mucronate, base subcordate to oblique, margins entire, slightly revolute, glabrescent to villous; venation campylodromous-brochidodromous, midrib sub-centric, with a tuft of white trichomes at the base of the abaxial surface. Homomorphic glomerules in axillary bundles, ca. 20 mm long; peduncle ca. 15 mm long, costate, villous; bracts caducous, 0.5–1 mm long, spatulate, abaxial surface pubescent. Flowers 20–22 mm long, pentamerous, sessile, ca. 10 flowers per inflorescence; calyx 2–2.5 mm long, infundibuliform, greenish white; lacinias ca. 0.1 mm long; corolla 7–8 mm long, infundibuliform, greenish white, villous; lacinias 2–3 mm long, villous; stamens monadelphous, filaments 21–24 mm long, cream-colored; stamen tube 6–8 mm long, cream-colored, enclosed or slightly exerted from the corolla; style ca. 14 mm long; ovary ca. 2 mm long, stipitate, glabrous to glabrescent; stipe 1.2–2 mm long. Fruits dehiscent, 2.5–7 × 7–8 cm, sigmoidal, red when mature, coriaceous, glabrous, linear spiraled, short stipitate, apex acuminate, base attenuated; stipe ca. 3 mm long. Seeds 10–11 mm long, brilliant black, oblong to oval, aril red.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, próximo ao rio Vaza Barris, 20/IX/2008, fl., M.V.V. Romão 337 (HUNEB); Fazenda. Serra Branca, caminho Velho em direção ao João Gomes, depois da porteira, 03/XI/2011, fl., fr. A.F.S. Brito 38 (HUNEB).

5. *Senegalia bahiensis* (Benth.) Seigler & Ebinger, Phytologia 88(1): 49. 2006. *Acacia bahiensis* Benth. Trans. Linn. Soc. London 30 (3): 525. 1875. Figures 2a-b; 5a-f.

Shrub ca. 7 m tall. Branches angular, aculeate, brown, glabrous, glabrescent to villous; prickle 1–3.4 mm long, straight or incurvate, base thick. Tector trichomes distributed on the branches, stipules, petioles, leaf rachis, leaflets, inflorescence axis, bracts, calyx and ovaries. Buds not observed. Stipules caducous, 8–9 × 4–7 mm, foliaceous, cordiform to oval, glabrous to pubescent. Extrafloral nectaries 0.5–1.2 × ca. 0.5 mm, stipe cylindrical to caliciform, located on the petiole just below the basal pair of pinnae, or on the rachis between the basal pair of pinnae, additional nectaries between the other pairs of pinnae. Leaves with 3–6 pairs of pinnae; petiole 1–2.2 cm long, sulcate, winged, laterally

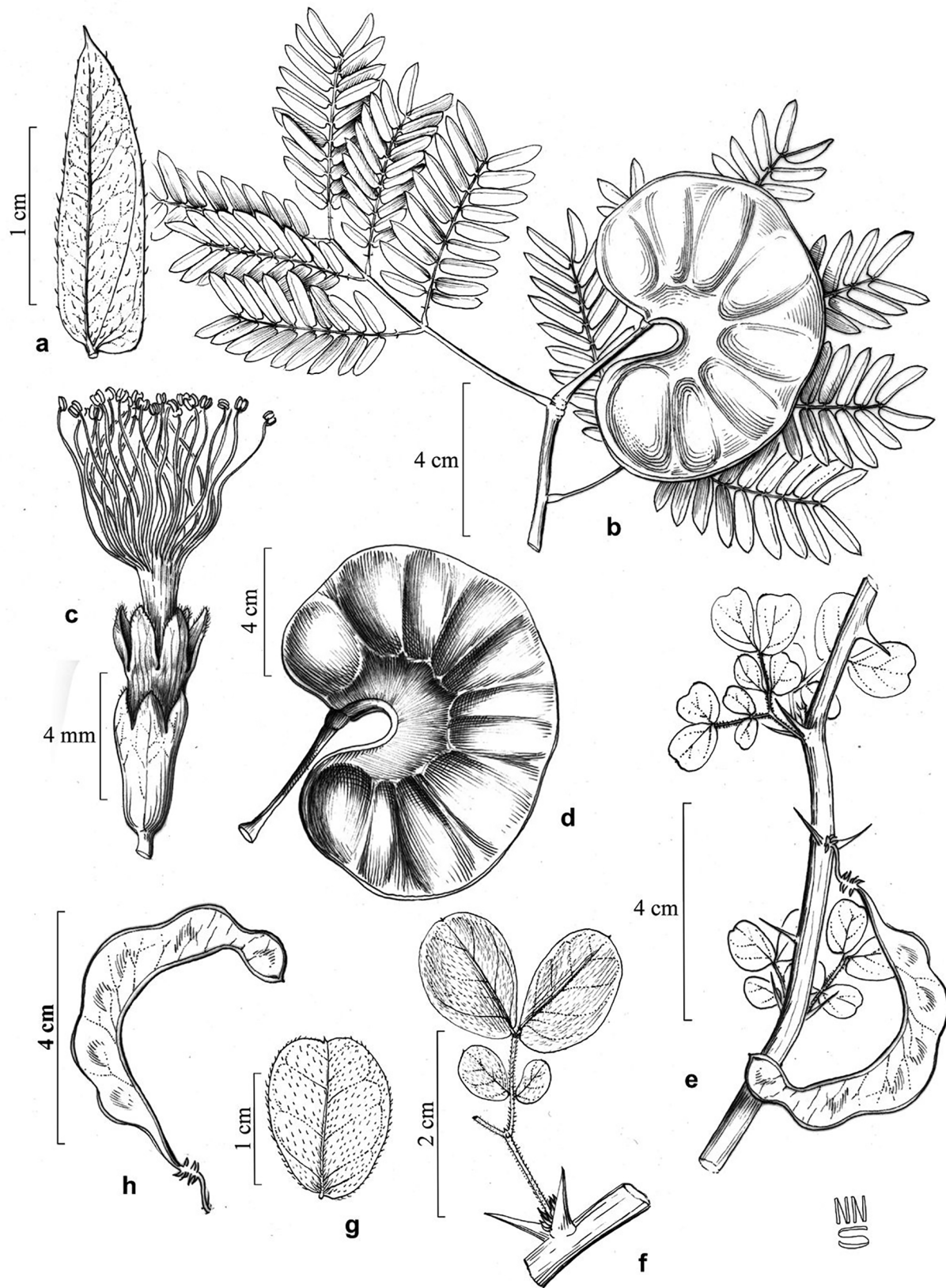


Figure 4. a-d. *Enterolobium timbouva*. a. leaflet, abaxial surface; b. fruiting branch; c. flower; d. fruit. e-h. *Pithecellobium diversifolium*. e. fruiting branch; f. detail of the leaves and spiny stipules. g. leaflet, abaxial surface; h. fruit. a-d from A. F. S. Brito 38; D. D. Vieira 56; e-h from A. F. S. Brito 38.

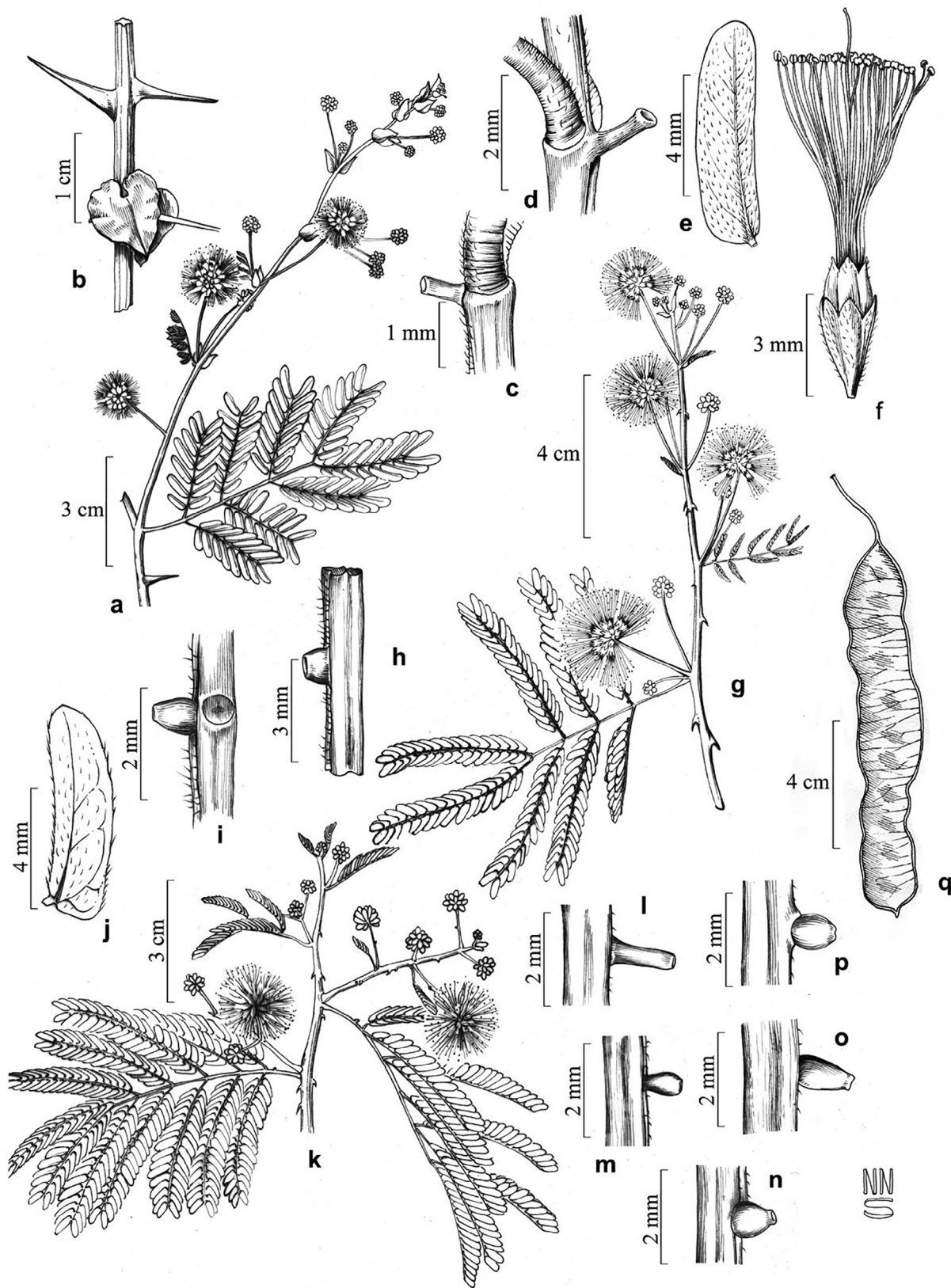


Figure 5. a-f. *Senegalia bahiensis*. a. flowering branch; b. details of the stipule and prickly; c. stipe cylindrical extrafloral nectaries; d. stipe caliciform extrafloral nectaries; e. leaflet, abaxial surface; f. flower. g-j. *Senegalia globosa*. g. flowering branch; h. globose extrafloral nectaries; i. conic extrafloral nectaries; j. leaflet, adaxial surface. k-q. *Senegalia limaе*. k. flowering branch; l. stipitate cylindrical extrafloral nectaries; m. caliciform extrafloral nectaries; n-o. conic extrafloral nectaries; p. globose concave extrafloral nectaries; q. fruit. a-f from . A. F. S. Brito 48; g-j from A. F. S. Brito 96; A. S. Conceição 1765; k-q from A. F. S. Brito 91.

constricted, glabrous to glabrescent; leaf rachis 2.4–6.4 cm long, sulcate, pubescent, armed or aculeate; rachis segments 9–12 mm long; paraphylls elliptic; leaflets 5–10 pairs, 4–11 × 2–3.5 mm, chartaceous, discolorous, oblong, flat, apices obtuse to rounded, base oblique, margins ciliate, glabrous to pubescent; venation campylodromous-brochidodromous, midrib exserted, with a tuft of trichomes at the base of the abaxial surface. Homomorphic glomerules, united in bundles located in the terminal or axillary (rarely) panicles on distal leaves, 7–9 mm diam.; peduncle 16–24 mm long, canaliculate, villous; bracts 6–10 × 3–6 mm long, persistent, oval, glabrous to pubescent at the base of the peduncle. Flowers 8–9 mm long, pentamerous, sessile, 22–35 per inflorescence; calyx 2.5–3 mm long, tubular, green, pubescent; laciniations ca. 5 mm long; corolla 4–4.5 mm long, tubular, green, glabrous, laciniations ca. 1 mm long; stamens, filaments 7–10 mm long whitish; style 11.5–12 mm long, whitish; ovary ca. 1 mm long, stipitate, tomentose; stipe 1.9–2 mm long. Fruits dehiscent, 7.5–10.1 × 1.4–2.1 cm, light brown when mature, chartaceous, glabrescent to villous, linear, apices acute, base obtuse, margins slightly undulating. Seeds not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, Fazenda Serra Branca, Baixa dos Mandacarus, próximo ao barreiro, 27/III/2012, A.F.S. Brito 48, fl.; fr. (HUNEB); 9 km da base da APA, 09/V/2008, M.V.V. Romão 153, fr. (HUNEB); Estrada sentido Serra do Navio, 10/VII/2012, A.F.S. Brito 93, fl. (HUNEB); Dedo de Deus, 10/VII/2012, J.V. Santos 41, fl. (HUNEB). Serra do Navio, 3/XI/2011, A.F.S. Brito 30, fr. (HUNEB); Serra do Navio, próximo ao barreiro, 10/VII/2012, J.V. Santos 39, fl.; fr. (HUNEB); Idem, 27/III/2012, A.F.S. Brito 49, fl.; fr. (HUNEB); 27/III/2012, A.F.S. Brito 50 (HUNEB); Vaca Morta, 13/III/2008, A.S. Conceição 1258, fl. (HUNEB); 17/IV/2008, A.S. Conceição 1283, fl. (HUNEB).

6. *Senegalia globosa* (Bocage & Miotto) L.P. Queiroz, Legum. Caatinga 196. 2009. *Acacia globosa* Bocage & Miotto, Rodriguésia 57: 131.2006. Figures 2c; 5g-j.

Shrub ca. 2 m tall. Branches slightly angular, aculeate, cream-colored to brown, glabrous; prickles 1–3 mm long, sparse, recurved, base thick. Tector trichomes distributed on the petioles, leaf rachis, leaflets, bracts, peduncles, and calyx. Buds absent. Stipules caducous, 2.5–3.5 × 0.5–1 mm, linear to lanceolate. Extrafloral nectaries 0.5–1.5 × ca. 0.5 mm, cylindrical to conical, located on the petioles, below the basal pair of pinnae, additional nectaries along the rachis or between the last two pairs of leaflets. Leaves with 4–8 pairs of pinnae; petiole 12–17 mm long, slightly sulcate, winged, laterally constricted, sericeous; rachis 2.5–4.1 cm long, canaliculate, sericeous; rachis segments 7.5–10 mm long; paraphylls linear to oblong; leaflets 18–24 pairs, 5–8 × 1.5–3 mm, chartaceous, discolorous, linear to oblong, slightly falcate, apices obtuse, base oblique, margins ciliate; venation campylodromous-brochidodromous, midrib exserted, with tuft of sericeous trichomes at the base of the abaxial face. Homomorphic glomerules united in axillary and terminal bundles, 17–22 mm diam.; peduncle 1.4–2.3 cm long, canaliculate, pubescent; bracts ca. 1 mm long, caducous, lanceolate, pubescent, at base of peduncle. Flowers 11–12 mm long, pentamerous, polystamenous, sessile, ca. 22 per inflorescence; calyx 2–2.5 mm long, campanulate to tubular, costate, white, glabrescent; laciniations ca. 5 mm long; corolla 4–5 mm long, tubular, white, glabrous, laciniations c. 0.5 mm long, margins ciliate; stamens 11–12 mm long, whitish; style 10.5–11.5

mm long, white; ovary ca. 1 mm long, stipitate, glabrous, stipe 1.0–2.5 mm long. Fruit not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, Baixa dos Quelés, 11/VII/2012, fl., A.F.S. Brito 96 (HUNEB); Baixa Grande, próximo ao Povoado dos Quelés, 19/III/2009, fl., A.S. Conceição 1592 (HUNEB); Quelés, 05/VI/2012, fl., A.F.S. Brito et al. 67 (HUNEB); Quelés, trilha que dá acesso à Estação Ecológica Raso da Catarina, 19/VI/2009, fl., A.S. Conceição 1765 (HUNEB).

7. *Senegalia limae* (Bocage & Miotto) L.P. Queiroz, Legum. Caatinga 198. 2009. *Acacia limae* Bocage & Miotto, Rodriguésia 57: 134.2006. Figures 2d-e; 5k-q.

Climbing shrub ca. 3 m tall. Branches angular, aculeate, cream-colored with darker longitudinal stripes, glabrescent; prickles 1–6 mm long, recurved, base thick. Tector trichomes distributed on the branches, stipules, petioles, leaf rachis, leaflets, bracts, calyx, and fruits. Buds not observed. Stipules 5–6 × 1.5–2.0 mm long, caducous, lanceolate to oval, glabrous, margins ciliate. Extrafloral nectaries 2–3 × ca. 1 mm, elevated, globose, concave, stipitate cylindrical, caliciform or conical, located on the petioles below the basal pair of pinnae, or on the rachis between the basal pair of pinnae, additional nectaries along the rachis, between or below the pairs of pinnae. Leaves with 6–7 pairs of pinnae; petiole 1.9–3.5 cm long, sulcate, winged, with lateral constriction, glabrous to glabrescent; rachis 3.0–7.7 cm long, cylindrical, sulcate, unarmed to aculeate, glabrescent to pubescent; rachis segments 1.0–1.8 cm long; paraphylls lanceolate to filiform; leaflets 19–22 pairs, 6–8 × 2–3 mm, chartaceous, discolorous, oblong, falcate, apices obtuse to cuneiform, base oblique, margins ciliate, glabrous to glabrescent; venation campylodromous-brochidodromous, midrib exserted, with a tuft of trichomes at the base of the abaxial face. Homomorphic glomerules united in bundles held in terminal or axillary panicles, 25–30 mm diam.; peduncle 1.4–5.2 cm long, canaliculate, villous; bracts ca. 1.5 mm long, caducous, oval, glabrescent, at base of peduncle. Flowers 16–18 mm long, pentamerous, sessile, ca. 25 flowers per inflorescence; calyx 1.5–2.5 mm long, campanulate to infundibuliform, light green, pubescent; laciniations c. 5 mm long; corolla 5–7 mm long, tubular, light green, glabrous, laciniations ca. 0.5 mm long; stamens free, filaments 10–14 mm long, cream-colored; style 16–17 mm long; ovary stipitate 1.5–2 mm long, glabrous, stipe 2–3 mm long. Fruits dehiscent, 9–13.5 × 1.5–3.3 cm long, chartaceous, greenish brown when young, pubescent, linear, apices acute to cuspidate, base attenuated to obtuse, margins thick, stipitate. Seeds not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, Baixa dos Quelés, estrada do Tamburi, 09/VII/2012, fl., A.F.S. Brito 91 (HUNEB); Estrada secundária, Baixa, próximo a casa com caixa d'água, 17/VII/2011, fl., fr., A.F.S. Brito 20 (HUNEB); 17/VII/2011, fr., A.F.S. Brito 21 (HUNEB); Estrada do Tamburi, próximo a baixa dos Quelés, 09/VII/2012, fl., J.V. dos Santos et al. 27 (HUNEB).

8. *Senegalia piauiensis* (Benth.) Seigler & Ebinger, Phytologia 88(1):61.2006. *Acacia piauiensis* Benth., Trans. Linn. Soc. London 30: 523. 1875. Figures 2f; 6a-c.

Small to large trees 6–12 m tall. Branches cylindrical, unarmed to rarely aculeate, brown with lighter colored longitudinal stripes, glabrous; prickles ca. 1 mm long, recurved. Tector trichomes distributed on the

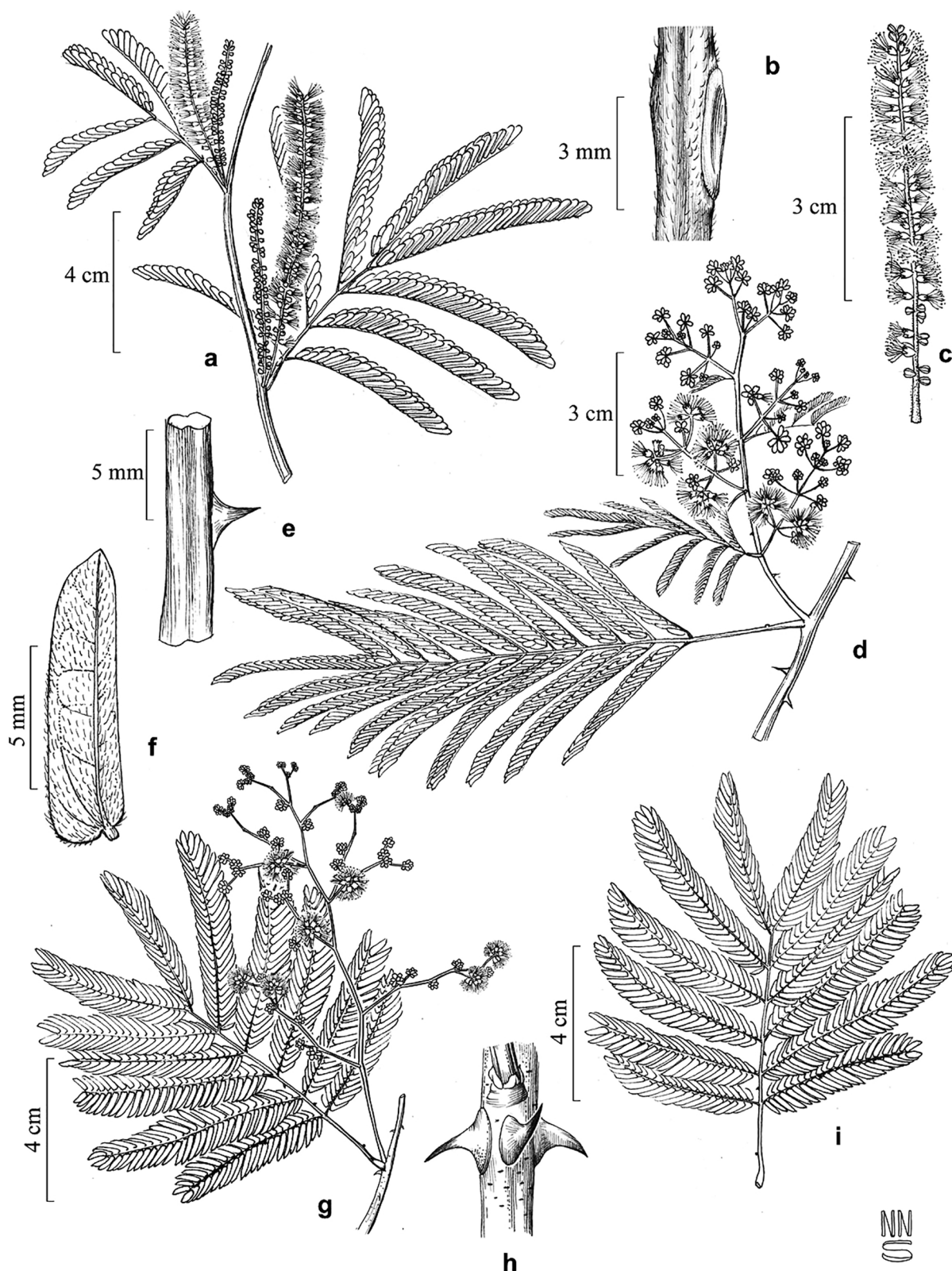


Figure 6. a-c. *Senegalia piuihensis*. a. flowering branch; b. enclosed concave extrafloral nectaries; c. spiciform inflorescence. d-f. *Senegalia polyphylla*. d. flowering branch; e. detail of the prickle; f. leaflet, abaxial surface. g-i. *Senegalia tenuifolia*. g. flowering branch; h. detail of the prickle; i. showing aculeate rachis leaf. a-c from A. F. S. Brito 50; A. S. Conceição 1337; d-f from A. F. S. Brito 56; g-i from A. F. S. Brito 69.

leaf rachis, petioles, leaflets, inflorescence axis, calyx, and corolla. Buds observed. Stipules caducous, not observed. Extrafloral nectaries 2.1–3 × c. 1 mm, elevated-concave to enclosed-concave, in different positions along the petiole. Leaves with 2–4 pairs of pinnae; petiole 2–3 mm long, flat, furrow absent, constrictions absent, glabrescent to pubescent; rachis 4.9–6.6 mm long, unarmed; rachis segments 12–20 mm long; paraphylls linear; leaflets 9–25 pairs, 6–13 × 2.5–3.5 mm, chartaceous, discolorous, linear to oblong, falcate, apices rounded to cuneiform, base oblique, margins ciliate, sericeous; venation campylodromous-brochidodromous, midrib exserted, tuft of trichomes at base of central nerve, absent on abaxial face. Spikes arranged in bundles on terminal and axillary pseudo-racemes, 8.6–10.2 × 1.6–1.9 cm long; peduncle 0.5–1.0 cm long, cylindrical, glabrous; bracts ca. 2.5 mm long, oval. Flowers 9–19 mm long, pentamerous, polystamenous, sessile, 38–78 per inflorescence; calyx 2–3 mm long, tubular, costate, white, pubescent; laciniations 0.5–1 mm long; corolla 3.5–4 mm long, tubular, whitish, glabrescent; laciniations 1–1.5 mm long; stamens 8–9 mm long, whitish; style 6–7 mm long, white; ovary stipitate 1–1.5 mm long, glabrous; stipe 1–1.5 mm long. Fruit not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, Fazenda Serra Branca, Baixa do Mandacaru Grande, ca. 6 Km da base da Vaca Morta, 18/IV/2008, fl., A.S. Conceição 1337 (HUNEB); Vaca Morta, trilha do Coleta, 28/III/2012, fl., A.F.S. Brito 52 (HUNEB).

9. *Senegalia polyphylla* (DC.) Britton & Rose in Britton & Killip, Ann. New York Acad. Sci. 35(3): 142.1936.

Acacia glomerosa Benth., J. Bot. (Hooker) 1:521. 1842. *Senegalia glomerulosa* (Benth.) Britton & Rose, N. Amer. Flowers 23:116.1928. Figures 2g-h; 6d-f.

Small tree to shrub 2–4 m tall. Branches cylindrical, unarmed to aculeate, dark green with lighter-colored longitudinal stripes, lenticels absent, pubescent to glabrescent; prickles 2–3 mm long, straight to incurvate with thick bases, not as triplets in the nodal region. Tector trichomes distributed on the branches, stipules, petioles, leaf rachis, leaflets, inflorescence axis, peduncles, calyx, corolla, and ovary. Buds not observed. Stipules caducous, ca. 6 × 2 mm, linear, striated, glabrescent. Extrafloral nectaries ca. 0.5 × 1–1.2 mm, elevated-concave, located on the petiole, additional nectaries between the last pair of pinnae. Leaves with 6–11 pairs of pinnae; petiole 1.7–3.2 mm long, sulcate, winged, with lateral constrictions, pubescent; rachis segments 8–14 mm long; paraphylls linear; leaflets 18–31 pairs, 9–10 × 2–3 mm, chartaceous, discolorous, linear to oblong, falcate, apices acute to acuminate, base oblique, margins ciliate, sericeous; venation campylodromous-brochidodromous, midrib exserted with a tuft of trichomes at the base of the abaxial face. Homomorphic glomerules united in bundles, arranged in terminal and axillary panicles, 8–11 mm diam.; peduncle 0.5–1.8 cm long, angular, pubescent; bracts oval ca. 2 mm long. Flowers 6–7 mm long, pentamerous, polystamenous, sessile, 13–15 per inflorescence; calyx 1.5–2 mm long, campanulate, cream-colored, sericeous; laciniations ca. 0.5 mm long; corolla 3–4.5 mm long, tubular, cream-colored, sericeous; laciniations ca. 0.5 mm long; stamens free, filaments 6–7 mm long, cream-colored; style 3.5–5 mm long, cream-colored; ovary stipitate 1–1.5 mm long, pubescent, stipe 2.5–3 mm long. Fruit not seen.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, estrada principal sentido Povoado Quelés, próximo à porteira, 16/VI/2011, fl., A.F.S. Brito 19 (HUNEB); Estrada do Tamburi, 14/V/2012, fl., A.F.S. Brito 56 (HUNEB); Baixa dos Quelés, 14/V/2012, fl., A.F.S. Brito 60 (HUNEB); 05/VI/2012, fl., A.F.S. Brito et al. 68 (HUNEB).

10. *Senegalia tenuifolia* (L.) Britton & Rose, N. Amer. Flowers 23 (2):128.1928. *Mimosa tenuifolia* L., Sp. Pl.: 523. 1753. Figures 2i-j; 6g-i.

Shrub ca. 3 m tall. Branches cylindrical, aculeate, brownish-vinaceous, lenticellate, with lighter colored longitudinal stripes, glabrescent to pubescent; prickles 2–7 mm long, straight to recurved, base thick, in triplets in the nodal region. Tector trichomes distributed on the branches, leaf rachis, leaflets, inflorescence axis, calyx, corolla, ovary, and fruits. Buds not observed. Stipules caducous, 2–8 mm long, lanceolate to linear. Extrafloral nectaries 0.5–1 × ca. 1 mm, elevated-concave to short stipitate, located on the petiole near the pulvinus, additional nectaries between the last pair of pinnae. Leaves with 5–9 pairs of pinnae; petiole 1.9–3.5 cm long, flat, slightly sinuous, furrows absent, constrictions absent, pubescent; rachis 3.5–7.9 cm long, cylindrical, sulcate, pubescent, aculeate; rachis segments 8–14 mm long; paraphylls filiform; 18–29 leaflet pairs, 5–11 × 2–3.5 mm, chartaceous, discolorous, linear, falcate, apices acute to acuminate, base oblique, margins ciliate, sericeous; venation campylodromous-brochidodromous, midrib exserted, tuft of trichomes at the base of the nerve on the abaxial face absent. Homomorphic glomerules united in bundles arranged in terminal panicles, 10–12 mm diam.; peduncle 4–7 mm long, canaliculate, tomentose, caducous bracts not seen. Flowers 5–7.5 mm long, pentamerous, polystamenous, sessile, 11–13 per inflorescence; calyx campanulate, 1.5–2 mm long, cream-colored, pubescent; laciniations ca. 0.5 mm long; corolla campanulate to tubular, 3–4 mm long, cream-colored, pubescent; laciniations ca. 0.5 mm long; stamens free, filaments 6–7 mm long, whitish; style 3.5–4 mm long, white; ovary stipitate, 1.1–1.5 mm long, tomentose; stipe 1–1.5 mm long. Fruits not observed.

Materials examined: BRAZIL. BAHIA: Jeremoabo, APA Serra Branca, Baixa dos Quelés, 14/V/2012, A.F.S. Brito 69, fl. (HUNEB).

Discussion

Calliandra aeschynomoides is endemic to Brazil, Caatinga region, with records from the states of Pernambuco and Bahia (Queiroz 2009, Flora do Brasil 2020). It differs from the other species by having unarmed branches, extrafloral nectaries absent on the petiole and leaf rachis, leaves with one pair of pinna, red flowers with long stamen tubes exserted from the corolla. It was collected with flowers in June and July, with fruit in April and October.

Chloroleucon foliolosum occurs in Argentina and Bolivia (Barneby & Grimes 1996) in all regions of Brazil, except the southern region (Souza 2018). It can be characterized by having flexuous branches, isolated spines or paired at the nodes, dormant buds scaly, heteromorphic glomerules, with differentiated central flowers, with long perianth, and stamen tubes exserted from the corolla. The fruit is characteristic of the species, generally dehiscent, linear, curved 90°–360°, with valves extending over the seeds. The flowers were observed in June, July and October the fruits were observed in July and October.

Enterolobium timbouva occurs in South America, with records from Brazil, Colombia, and Paraguay (Mesquita 1990); occurs in northern, northeastern, midwest, and southeastern Brazil in the phytogeographical domains of Caatinga, Atlantic Forest and Amazon Forest (Mesquita et al. 2018). It was collected in anthropized areas, growing on sandy soils in pastures and agricultural plots. It was collected with flowers in the month of December and fruits in March and May. The species can be distinguished from the other species occurring in EPASB by having an arboreal habit, 8-10 m tall, lenticular branches, leaves with 2-4 pairs of pinnae; oval petiole, and auriculate fruit, blackish when mature. It was collected with flowers in the month of December and fruits in March and May.

Pithecellobium diversifolium is endemic to Brazil and restricted to the areas of dryland caatinga of the Northeastern region (Iganci 2015). This species can be recognized by presence of leaves with 1-2 pairs of pinnae, elliptic to oval leaflets, spiny stipules (stipules transformed into spines), villous corolla, and sigmoidal fruits in spirals. The seeds of this species are also important in their identification as they are shiny and black with a red aril having a sweet taste. This species is easily recognized in the field due to the morphology of the leaflets, and the spiraled fruit when young are green and ripe are red. The flowers and fruits were observed in October.

Senegalia bahiensis is endemic to Brazil, distributed in the northeastern (Alagoas, Bahia, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe) and southeastern (Minas Gerais and Rio de Janeiro) regions of that country (Ribeiro 2012, Flora do Brasil 2020). It can be recognized in the EPASB by having angular branches, prickle generally straight, stipules cordiform foliaceous to oval, and stipitate extrafloral nectaries cylindrical to calicoid. The specimens were collected with flowers in May and October, and with fruits in March.

Senegalia globosa is endemic to Brazil and endemic from Bahia State in caatinga vegetation (Queiroz 2009, Flora do Brasil 2020). This species demonstrates morphological variability the numbers of pairs of leaflets and the shape of its extrafloral nectaries, globose or conical, distributed below the basal pinna pair or in the median region of the petiole, with or without additional nectar distributed along the rach or between last pairs of leaflets. It is characterized by having slightly angular branches, recurved prickle, stipules linear to lanceolate, and relatively large glomerules (17-22 cm diameter). The flowers were observed in July.

Senegalia limae is endemic to Brazil, essentially native from caatinga vegetation, and has been recorded in northeastern Brazil in the states of Pernambuco and Bahia, in the southeastern region of that country in Minas Gerais State (Queiroz 2009, Flora do Brasil 2020). Ribeiro (2012) noted that many collected specimens have been identified as *S. limae*, *Acacia limae* although analyses of the type specimen and additional material indicated them to be *S. lasiophylla*. (Benth.) Seigler & Ebinger (Flora do Brasil 2020). We prefer to maintain the older classification in this work as Ribeiro (2012) has not yet been formally published. This species demonstrates wide variations in the shapes and positions of its extrafloral nectaries, elevated, globose, concave, estipitate cylindrical, caliciform or conical. It can be recognized by its climbing habit, stipules lanceolate to oval, relatively large glomerules (25-30 mm in diameter), and flowers 16-18 mm long. The flowers were observed in July. *Senegalia limae* can sometimes be confused with *S.*

globosa because both have leaves with similar numbers of pinnae. The two species can be easily distinguished, however, because *S. limae* is a climbing plant (*vs.* a shrub) with glomerules 25-30 mm in diameter (*vs.* glomerules 18-24 mm in diameter in *S. globosa*).

Senegalia piauiensis endemic to Brazil, found in caatinga vegetation in northeastern Brazil, occurring in the states of Piauí, Ceará, Pernambuco, Bahia, Alagoas, and Sergipe (Queiroz 2009, Flora do Brasil 2020). This species is characterized by having leaves with 2-4 pairs of pinnae, elevated-concave to enclosed-concave nectaries along the petiole and, principally, by its inflorescence in spikes, 8.6-10.2 cm long. *Senegalia piauiensis* differs from the other congeneric species occurring in the area by displaying its inflorescence in spikes (*vs.* glomerules). It was collected with flowers in March and April.

Senegalia polyphylla is widely distributed in the Americas (Rico-Arce 2007). It occurs in the northern, northeastern, and central-western regions of Brazil in caatinga, cerrado, amazon forest and atlantic forest, and in the seasonally flooded "pantanal" region (Morim & Barros 2012). It is characterized by having cylindrical branches, not lenticular, incurved prickle, not in triplets in the nodal region, midrib with a tufted of trichomes at the base of the abaxial face, glomerules 8-11 mm in diameter, and cream-colored flowers. It was collected with flowers in May and June.

Senegalia tenuifolia is distributed in South America, with records for Argentina, Brazil, and Paraguay (Rico-Arce 2007). According to Ribeiro (2012), this species has been recorded to northern (in the states of Acre, Amazonas, and Pará), northeastern (Bahia, Paraíba and Pernambuco), central-western (Goiás and Mato Grosso), and southeastern (Minas Gerais, Rio de Janeiro and São Paulo) regions of Brazil. According to Queiroz (2009), this taxon occurs principally in seasonal forests and rainforests in northern Brazil, and occasionally in caatinga vegetation, especially arboreal caatinga. It was registered in arboreal shrub vegetation in the EPASB, growing on sandy soils. *Senegalia tenuifolia* can be recognized in the field by having branches cylindrical, lenticular, armed with recurved prickle in triplets in the nodal region, and by having small glomerules, 10-12 mm in diameter. It can be confused with *S. polyphylla* in the study area as both produce inflorescences in small glomerules with cream-colored flowers. However, *S. tenuifolia* can be easily distinguished by having lenticular branches (*vs.* branches not lenticular), recurved prickle, in triplets in the nodal region (*vs.* incurved prickle not in triplets). Flowering was observed in May.

The morphological characters for recognition of the Acaciae and Ingeae tribes were: arrangement of prickles on the branches, presence or absence of spines or prickles, shape of stipules, shape and position of extrafloral nectars, number of leaflet pairs, inflorescence pattern and types of fruits.

With the study carried out at the EPASB, we can infer the environmental, taxonomic, and systematic relevance of the identified groups, mainly the degree of endemism of the Brazil for the species recorded. Among the species studied, six are registered as endemic to Brazil. The Acaciae Tribe is represented by *S. bahiensis*, *S. globosa*, *S. limae*, e *S. piauiensis*. The Ingeae Tribe is represented by *Calliandra aescynomenoides* and *Pithecellobium diversifolium*. These species also present distribution to the Caatinga domain (*sensu stricto*). Of these, only *S. globosa* was registered as endemic to the Bahia states.

Supplementary material

The following online material is available for this article:

The Appendix 1 - List of additional material examined.

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Author Contributions

Aline Franco Sampaio Brito: Contribution to the acquisition of data; analysis and interpretation of data; work of writing and conception and design work.

Élvia Rodrigues de Souza: Contribution to the interpretation of data and critical review adding intellectual content.

Adilva de Souza Conceição: Contribution to the acquisition of data; analysis and interpretation of data; work of writing; critical review adding intellectual content and conception and design work.

Conflicts of interest

The authors declare that they have no conflict of interest related to the publication of this manuscript.

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