Rodriguésia 73: e01932020. 2022
http://rodriguesia.jbrj.gov.br
DOI: http://dx.doi.org/10.1590/2175-7860202273064

Original Paper

Bignonieae (Bignoniaceae) from the Pico do Jabre, Paraíba, Brazil: Taxonomic diversity and distribution

Rafael Francisco Lopes-Silva[1,4], *Simone Cristina Miranda Cabral*[1,5], *George Sidney Baracho*[2], *Lúcia Garcez Lohmann*[3] & *Maria de Fátima Agra*[1,6,7]

Abstract

The tribe Bignonieae with approximately 393 species, represents the largest tribe of Bignoniaceae. Most members of Bignonieae are tendrillate lianas, although some shrubs are also found within this clade. The Pico do Jabre, located at 1,197 m of altitude, represents the highest mountain in the state of Paraíba (Brazil) and an area of extreme biological importance. We conducted an inventory of the Bignonieae from the Pico do Jabre. We documented eight genera and 13 species, only *Tanaecium parviflorum* is a shrub. The most diverse genera recorded are: *Tanaecium* (3 spp.), *Amphilophium* (2 spp.), *Bignonia* (2 spp.) and *Xylophragma* (2 spp.). *Anemopaegma*, *Cuspidaria*, *Dolichandra* and *Pyrostegia* are represented by a single species each. Six species are new records for the region (*i.e.*, *Bignonia ramentacea*, *B. sciuripabulum*, *Tanaecium cyrtanthum*, *T. dichotomum*, *Xylophragma harleyi* and *X. heterocalyx*). *Tanaecium cyrtanthum*, *X. harleyi* and *X. heterocalyx* are new records for the state of Paraíba. Prior to this study, *Xylophragma heterocalyx* was only known from the type specimen, from Minas Gerais, representing a new record for the Caatinga. The high number of new records found in this study highlights the importance of regional floristic inventories for the documentation of new species occurrences.

Key words: Bignonieae clade, Caatinga domain, flora of Brazil, Lamiales, Paraíba.

Resumo

A tribo Bignonieae, com aproximadamente 393 espécies, representa a maior tribo. A maioria dos membros de Bignonieae é de lianas com gavinhas, embora alguns arbustos também estejam incluídos. O Pico do Jabre está localizado a 1.197 m de altitude, representando o ponto com maior altitude no estado da Paraíba (Brasil) e uma área de extrema importância biológica. Neste estudo realizamos um inventário da tribo Bignonieae no Pico do Jabre em diferentes altitudes (700–1.200 m). Documentamos oito gêneros e 13 espécies, a maioria lianas, exceto *Tanaecium parviflorum* que é um arbusto. Os gêneros mais diversos na área são: *Tanaecium* (3 spp.), *Amphilophium* (2 spp.), *Bignonia* (2 spp.) e *Xylophragma* (2 spp.). Os gêneros *Anemopaegma*, *Cuspidaria*, *Dolichandra* e *Pyrostegia* estão representados por uma espécie cada. Seis espécies são novos registros para o Pico do Jabre (*i.e.*, *B. ramentacea*, *B. sciuripabulum*, *T. cyrtanthum*, *T. dichotomum*, *Xylophragma harleyi e X. heterocalyx*). *Tanaecium cyrtanthum*, *X. harleyi* e *X. heterocalyx* constituem novos registros para o estado da Paraíba. Antes deste estudo, *Xylophragma heterocalyx* era apenas conhecida apenas do espécime tipo, coletado em Minas Gerais, representando um novo registro para o domínio fitogeográfico da Caatinga. O alto número de novos registros encontrados neste estudo indica a importância de estudos florísticos regionais para a documentação de novas ocorrências.

Palavras-chave: clado Bignonieae, Caatinga, flora do Brasil, Lamiales, Paraíba.

[1] Universidade Federal da Paraíba, Centro de Ciências Agrárias, Prog. Pós-graduação em Biodiversidade, Areia, PB, Brazil.

[2] Universidade de Pernambuco, Depto. Ciências Biológicas, Recife, PE, Brazil. georgesidney@hotmail.com ORCID: <https://orcid.org/0000-0003-2278-5980>.

[3] Universidade de São Paulo, Inst. Biociências, Depto. Botânica, Cidade Universitária, São Paulo, SP, Brazil. ORCID: <https://orcid.org/0000-0003-4960-0587>.

[4] ORCID: <https://orcid.org/0000-0001-9557-6915>. [5] ORCID: <https://orcid.org/0000-0001-6004-1347>. [6] ORCID: <https://orcid.org/0000-0002-8888-0975>.

[7] Author for correspondence: agramf@ltf.ufpb.br

Introduction

The Bignoniaceae includes around 80 genera and 827 species (Lohmann & Ulloa Ulloa 2021). This plant family represents an important component of Neotropical forests, where lianas from the tribe Bignonieae and trees from the *Tabebuia* alliance are abundant (Lohmann & Taylor 2014). Brazil is the center of diversity of this plant family (Gentry 1980).

The Bignonieae, with approximately 393 species, is the largest clade within the family (Lohmann 2006; Olmstead *et al*. 2009; Lohmann & Taylor 2014). The tribe includes high ecological diversity with species occupying a broad range of habitats, from wet Atlantic and Amazonian rainforests to seasonal dry habitats from the Brazilian Caatinga and Chaco (Lohmann 2006; Lohmann *et al*. 2013). In Brazil, Bignonieae is represented by ca. 308 species and distributed through all phytogeographical domains (Lohmann 2010).

All members of Bignonieae are woody, mostly lianas, with an unusual wood anatomy, composed of four to thirty-two phloem wedges (Pace *et al*. 2009, 2015). The leaves are usually 2–3-foliolate with the terminal leaflet modified into a simple, bifid, or multifid tendril (Sousa-Baena *et al*. 2014a). The flowers are showy and are visited by a broad range of floral visitors and pollinators (Alcantara & Lohmann 2010). The fruits are septicidal capsules with the septum parallel to the valves (Olmstead *et al*. 2009).

Many species of Bignonieae are used by indigenous peoples to treat various diseases (Gentry 1992), including *Pyrostegia venusta* (Ker Gawl.) Miers, *Mansoa alliacea* (Lam.) A.H. Gentry, *Arrabidaea chica* (Bonpl.) Verl. [= *Fridericia chica* (Bonpl.) L.G.Lohmann] (Stasi & Hiruma-Lima 2002), *Tanaecium nocturnum* (Barb. Rodr.) Bureau & K.Schum., *Martinella obovata* (Kunth) Bureau & K.Schum., *Pachyptera alliacea* (Lam.) A.H.Gentry, and *Cydista aequinoctialis* Miers [= *Bignonia aequinoctialis* L.] (Amorozo & Gély 1988).

The Pico do Jabre State Park is located at 1,197 m of altitude, in the municipalities of Maturéia and Mãe D'água, representing the highest mountain of Paraíba state, Brazil (SUDEMA 1994). It is covered by Semideciduous Montane Seasonal Forest (Tabarelli & Santos 2004) and is considered a priority area for biodiversity conservation. It consists on a mountainous forest enclave that is part of the Caatinga domain in Northeastern Brazil. Very few of the remaining areas of dry forests are protected, making this vegetation highly threatened (DRYFLOR 2016).

The importance of the Pico do Jabre for conservation makes it a crucial location for biodiversity inventories (Maury 2002). Despite its importance for the preservation of dry forest remnants, few studies to date have focused on its flora (Pontes & Agra 2001; Rocha & Agra 2002; Agra *et al.* 2004). Here, we conducted a taxonomic inventory of tribe Bignonieae (Bignoniaceae) at different altitudes, from the lowest (at about 700 m) to the highest (1,034–1,200 m).

Material and Methods

Study area

The Pico do Jabre State Park is a preserved area that was established on the October 19th 1992 by decree 14,843 (Cunha 2010). The park covers ca. 500 hectares and is a priority for conservation in Brazil (MMA 2000). It is located on the eastern slope of the Borborema Plateau (Velloso *et al*. 2002), between the municipalities of Maturéia and Mãe D'água, within the state of Paraíba, Brazil (Cunha *et al*. 2013), under coordinates 07°15'18.4"S and 37°23'13.1"W (Fig. 1) (IBGE 2005). This park represents the highest point in the state of Paraíba, reaching 1,197 m high (Cunha *et al*. 2013). The Pico do Jabre is surrounded by the Sertaneja Depression in the north, by the Cariri of Paraíba in the east, and by the Pajeú valley in the south (Borges & Maciel 2003).

The Pico do Jabre is part of the Caatinga domain of Northeastern Brazil and is covered by Semideciduous Montane Seasonal Forests, rainforests, and dry forest vegetation types (Rocha & Agra 2002; Agra *et al*. 2004; Cunha & Silva Junior 2014). According to Köppen's classification, the climate is warm and semi-humid AW type (Lima & Heckendorff 1985), with annual precipitation between 800–1,000 mm (Cunha & Silva-Junior 2014).

Field work and taxonomic inventory

Twenty-four field expeditions were carried out at the Pico do Jabre, during the dry and rainy seasons of 2018 and 2019. Specimens were treated according to usual procedures in plant taxonomy (Forman & Bridson 1989) and deposited at the following herbaria: Prof. Jayme Coelho de Moraes (EAN), Prof. Lauro Pires Xavier (JPB),

Universidade de São Paulo (SPF), and Rio de Janeiro Botanical Garden (RB) (acronyms follow Thiers, continuously updated). In addition, 53 specimens of Bignonieae previously collected in the park and deposited at EAN, JPB, MO, and NY herbaria were also analyzed.

All materials were identified using specialized literature (Lohmann & Pirani 1998; Fischer *et al*. 2004; Zuntini 2014; Fonseca *et al*. 2017; Silva *et al*. 2018; Frazão & Lohmann 2019; and Kaehler & Lohmann 2020), botanical descriptions available through the "Flora of Brazil" website (Lohmann *et al.* 2021), and comparisons with virtual images and specimens of the following herbaria: EAN, JPB, K, NY, MO, P, RB, SP, and SPF (acronyms according Thiers, continuously updated). In addition, information on ethnobotanical uses available in the literature were also included for five species.

General morphological descriptions follow the terminology of Stearn (1992), Radford *et al*. (1974), and Harris & Harris (2001). Trichomes terminology follows Seibert (1945) and Nogueira *et al*. (2013), leaf architecture follows LAWG (1999), while specific Bignonieae terms follow Lohmann & Taylor (2014).

Results and Discussion

Diversity

The study of all specimens of Bignonieae from the Pico do Jabre and a literature review led to the recognition of eight genera and 13 species in the region, as follows: *Amphilophium crucigerum* (L.)

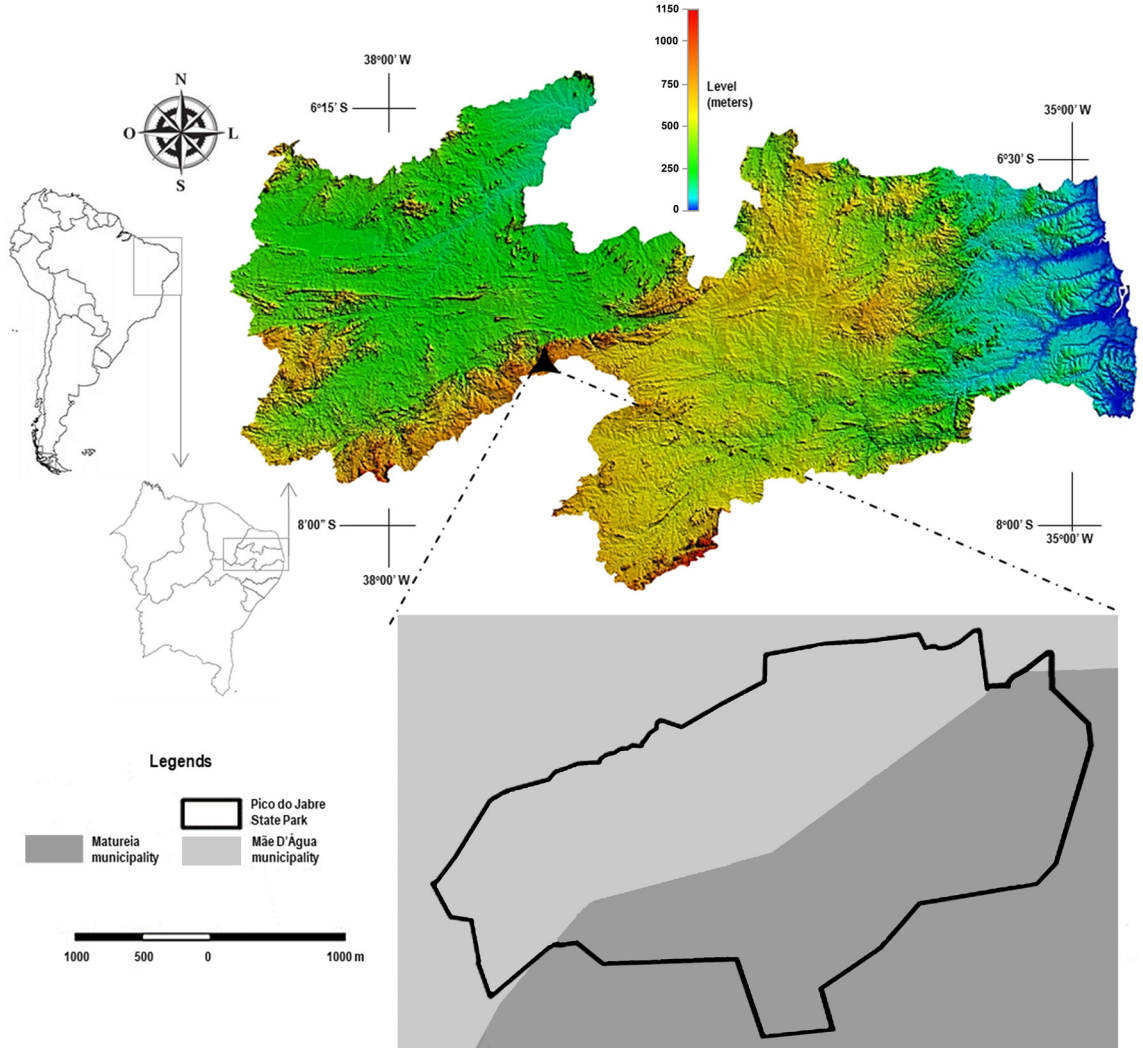

Figure 1 – Study area: Pico do Jabre, state of Paraíba, Brazil.

L.G.Lohmann, *Amphilophium paniculatum* Kunth, *Anemopaegma citrinum* Mart. *ex* DC., *Bignonia ramentacea* (Mart. *ex* DC.) L.G.Lohmann, *Bignonia sciuripabulum* (Hovel.) L.G.Lohmann, *Cuspidaria lateriflora* (Mart.) DC., *Dolichandra unguis-cati* (L.) L.G.Lohmann, *Pyrostegia venusta* (Ker Gawl.) Miers, *Tanaecium cyrtanthum* (Mart. *ex* DC.) Bureau & K.Schum., *Tanaecium dichotomum* (Jacq.) Kaehler & L.G.Lohmann, *Tanaecium parviflorum* (Mart. *ex* DC.) Kaehler & L.G.Lohmann, *Xylophragma harleyi* (A.H.Gentry *ex* M.M.Silva & L.P.Queiroz) L.G.Lohmann, and *Xylophragma heterocalyx* (Bureau & K.Schum.) A.H.Gentry.

Of the 13 species documented in the region, eight were cited on an earlier treatment of the Pico do Jabre (Agra *et al*. 2004), while six represent new records for the region, namely: *B. ramentacea*, *B. sciuripabulum*, *T. cyrtanthum*, *T. dichotomum*, *X. harleyi*, and *X. heterocalyx*. Of these, *T. cyrtanthum*, *X. harleyi*, and *X. heterocalyx* are new records for the state of Paraíba, while *X. heterocalyx* is a new record for the Caatinga as a whole.

One species identified at the generic level (*i.e*., *Arrabidaea* sp.) in the previous treatment of the Bignoniaceae for the Pico do Jabre (Agra *et al.* 2004), was here shown to represent *X. harleyi*. Furthermore, materials previously identified as *Clytostoma binatum* (Thunb.) Sandwith [= *Bignonia binata* Thunb.] were here shown to correspond to two different species of *Bignonia*, i.e., *B. ramentacea* and *B. sciuripabulum*.

The genus with the highest number of species at the Pico do Jabre is *Tanaecium*, with three species, followed by *Amphilophium*, *Bignonia*, and *Xylophragma*, with two species each. The other four genera documented are represented by only one species each: *Anemopaegma*, *Cuspidaria*, *Dolichandra*, and *Pyrostegia*.

Morphology

Liana is the most common habit in the area, found in twelve species (Tab. 1). Only *T. parviflorum* showed a shrubby habit. *Dolichandra unguis-cati* showed the thinnest stem and branches, 2–3.5 mm wide, among all species studied. Leaves are 1–3-foliolate, with eight species showing 2–3-foliolate leaves, two species are exclusively 3-foliolate (*i.e.*, *C. lateriflora* and *T. parviflorum*), two species are 1–2-foliolate (*i.e.*, *B. ramentacea* and *B. sciuripabulum*), and one species is exclusively 2-foliolate (*i.e.*, *D. unguis-cati*) (Tab. 1).

In most species, the terminal leaflet is modified into a tendril, except from *C. lateriflora* and *T. parviflorum*. This trait constitutes one of the most important characters for the recognition of members of Bignonieae (Sousa-Baena *et al*. 2014a, b). Simple tendrils are found in eight species (Tab. 1), trifid tendrils in three species (*i.e.*, *A. citrinum*, *D. unguis-cati*, and *P. venusta*), and multifid tendrils in two species (*i.e.*, *A. crucigerum* and *A. paniculatum*). Tendrils of *A. crucigerum* and *A. paniculatum* show adhesive disks on the tips, while those of *D. unguis-cati* show uncinate apices.

Inflorescences vary from few-flowered, as observed in *T. parviflorum* (Fig. 2a) and *A. citrinum* (Fig. 2b), to densely-flowered as those found in *X. harleyi*, *P. venusta*, and *X. heterocalyx* (Fig. 2c). Most species have infundibular corollas with included stamens, except from *P. venusta* (Fig. 2d) and *T. cyrtanthum* that have exserted stamens. Flowers have conspicuous nectar-guides in *B. ramentacea* (Fig. 2e) and *B. sciuripabulum* (Fig. 2f).

All species show sparse to dense lepidote indument and glandular and non-glandular trichomes on leaves and tendrils. Five types of glandular trichomes were observed: (i) stipitate, generally in the corolla and other reproductive organs (pedicels and calyx of *T. dichotomum*); (ii) capitate, observed on leaflet blades of *T. parviflorum*; (iii) peltate, common in the leaves of all species studied; (iv) patelliform, common in the basal portions of the abaxial surface of leaves of some species (*e.g.*, *T. cyrtanthum*); and (v) patelliform/cupular, found in certain parts of the leaflets (*e.g.*, *P. venusta* and *A. citrinum*). Simple and branched non-glandular trichomes were also documented. Simple non-glandular trichomes are uniseriate and multicellular, and common in the leaves of all species. Branched non-glandular trichomes are found on the leaves of *X. harleyi* and in some reproductive portions of *X. heterocalyx*.

Distribution

Species of Bignonieae from the Pico do Jabre show a discontinuous distribution throughout the mountain range, occurring both in areas with deep soil and areas with great solar exposure on granitic rocks. Regarding the altitudinal occurrence, two species were collected and observed exclusively at the basal portions of the mountain (*i.e.*, *C. lateriflora* and *T. dichotomum*), one exclusively at the intermediate portions of the mountain (*i.e.*, *T. parviflorum*), and two exclusively at the upper

Table 1 – Morphological characters of the Bignonieae species from Pico do Jabre. CNG = conspicuous nectar guides; bl = bromeliad-like; fo = foliaceous; su = subulate; tr = triangular.

Species	Characters												
	Habit	**Interpetiolar gland fields**	**Prophyll type**	**Leaflets number**	**Leaflet margin**	**Tendril type**	**Tendril apex**	**CNG**	**Calyx**	**Corolla**	**Corolla fauce**	**Stipe of ovary**	**Stamens**
A. crucigerum	liana	absent	fo	2–3	entire	multifid	adhesive disk	absent	simple	white	yellow	absent	included
A. paniculatum	liana	absent	fo	2–3	entire	multifid	adhesive disk	absent	double	lilac to pink	yellow	absent	included
A. citrinum	liana	absent	fo	2–3	entire	trifid	simple	absent	simple	yellow	yellow	present	included
B. ramentacea	liana	absent	tr	1–2	entire	simple	simple	present	simple	rose to purple	variegata	absent	included
B. sciuripabulum	liana	absent	tr	1–2	entire	simple	simple	present	simple	rose to purple	variegata	absent	included
C. lateriflora	liana	present	tr	3	entire	simple	simple	absent	simple	pink	pink	absent	included
D. unguis-cati	liana	present	su	2	entire to dentate	trifid	uncinate	absent	simple	yellow	yellow	absent	included
P. venusta	liana	absent	fo	2–3	entire	trifid	simple	absent	simple	orange	orange	absent	exserted
T. cyrthantum	liana	present	tr	2–3	entire	simple	simple	absent	simple	white	white	absent	exserted
T. dichotomum	liana	absent	tr	2–3	entire	simple	simple	absent	simple	pink	white	absent	included
T. parviflorum	shrub	absent	tr	3	partially crenate	simple	simple	absent	simple	whitish to pink	whitish	absent	included
X. harleyi	liana	present	tr	2–3	entire	simple	simple	absent	simple	pink	pink	absent	included
X. heterocalyx	liana	present	bl	2–3	entire	simple	simple	absent	simple	lilac	white or yellow	absent	included

portions of the mountain (*i.e.*, *A. crucigerum* and *P. venusta*). Furthermore, three species were found at the base of the mountain, growing all the way into the intermediate portions (*i.e.*, *T. cyrtanthum*, *X. harleyi*, and *X. heterocalyx*), while five species were broadly distributed throughout the mountain (*i.e.*, *A. paniculatum*, *A. citrinum*, *B. ramentacea*, *B. sciuripabulum*, and *D. unguis-cati*).

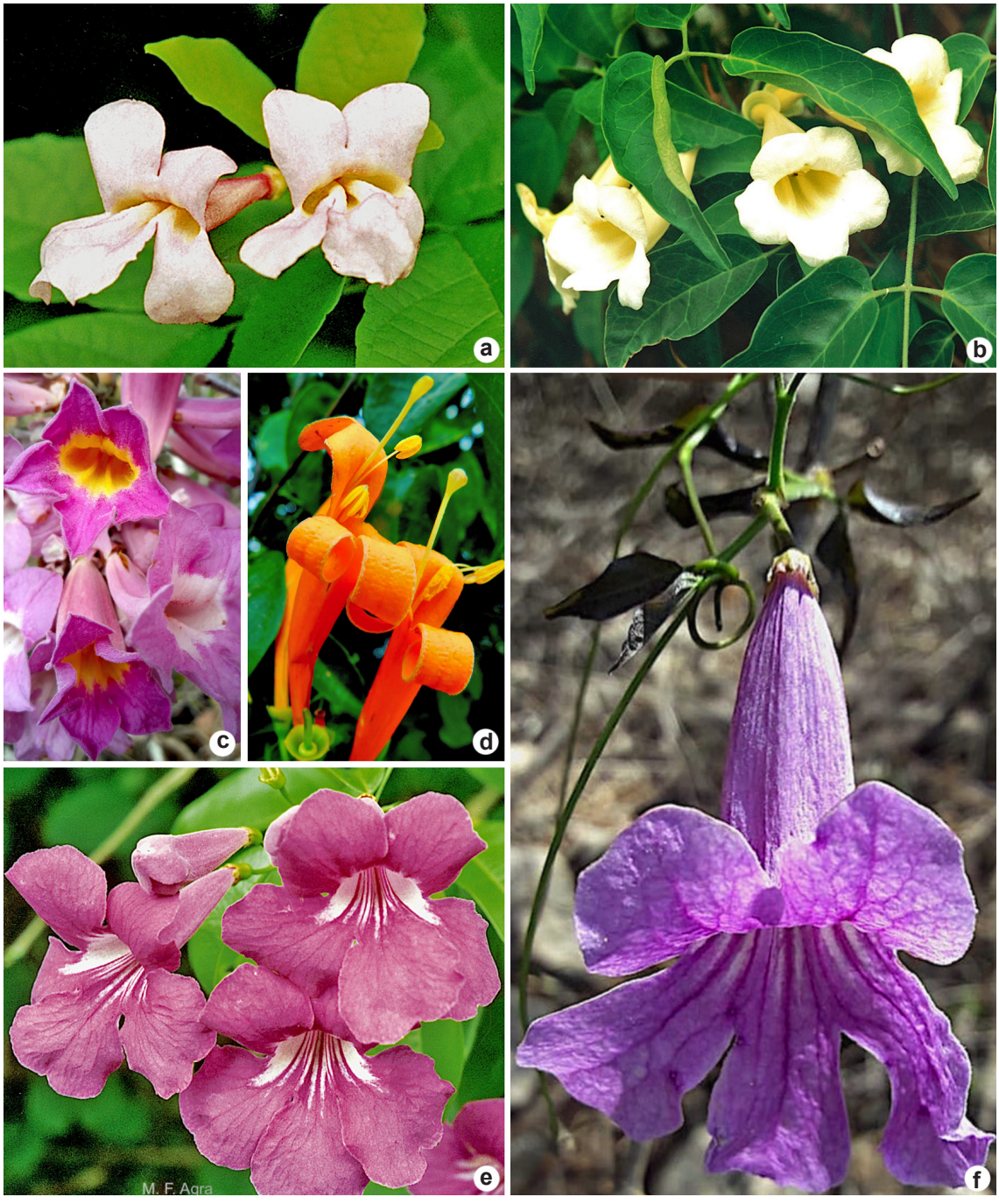

Figure 2 – a-b. Few-flowered inflorescences – a. *Tanaecium parviflorum*; b. *Anemopaegma citrinum*. c. many-flowered inflorescences of *Xylophragma heterocalyx*. d. flowers with exserted stamens of *Pyrostegia venusta*. e-f. flowers with conspicuous nectar guides – e. *Bignonia ramentacea*; f. *Bignonia sciuripabulum*. (b. *M.F. Agra et al. 2629*; c. *R. Lopes 261*; d. *R. Lopes 257*; e. *Agra et al. 4365*; f. *R. Lopes 253*). Photos by R. Lopes (a, c, d, e) and M.F. Agra (b, f).

Key for the identification of species of Bignonieae from the Pico do Jabre

1. Plants with trifid or multifid tendrils 2
   2. Stems and branches 6-angled; multifid tendrils with adhesive disks at the apex 3
      3. Calyx simple; fruit with epicarp strongly muricate..... 1. *Amphilophium crucigerum*
      3'. Calyx double; fruit with epicarp smooth..... 2. *Amphilophium paniculatum*
   2'. Stems and branches cylindrical to discretely tetragonal or 4-angled; trifid tendrils without adhesive disks at the apex 4
      4. Corolla yellowish; fruit elliptic to sub-orbicular, up to 8 cm long, stipitate ..... 3. *Anemopaegma citrinum*
      4'. Corolla dark-yellow or orange; fruit linear flattened, longer than 18 cm long, not stipitate 5
         5. Tendrils with apex uncinate; calyx truncate; corolla yellow; stigma and stamens included ..... 7. *Dolichandra unguis-cati*
         5'. Tendrils with apex non-uncinate; calyx 5-lobed; corolla orange; stigma and stamens exserted ..... 8. *Pyrostegia venusta*
1'. Plants with simple tendrils 6
   6. Corolla with conspicuous nectar guides..... 7
      7. Branches cylindrical to discretely tetragonal, not winged; leaflet pubescent when young, apiculate at the apex ..... 4. *Bignonia ramentacea*
      7'. Branches 4-angled, winged; leaflets glabrous to glabrescent, acuminate at the apex ..... 5. *Bignonia sciuripabulum*
   6'. Corolla without nectar guides, if present, with only faint guides 8
      8. Corolla white to whitish, tube with 6.5–9.5 cm long..... 9. *Tanaecium cyrtanthum*
      8'. Corolla rose, pink or lilac, tube up to 4 cm long..... 9
         9. Branches with interpetiolar gland fields..... 10
            10. Petiole hexagonal; anthers reflexed forward ..... 6. *Cuspidaria lateriflora*
            10'. Petiole not hexagonal, anthers not reflexed forward 11
               11. Leaves lepidote-pubescent, trichomes simple, and branched; calyx tubular, corolla mouth completely pink, without color variation within the same inflorescence..... 12. *Xylophragma harleyi*
               11'. Leaves sparse-lepidote, trichomes simple, non branched, calyx campanulate; corolla mouth white and yellow in the same inflorescence..... 13. *Xylophragma heterocalyx*
         9'. Branches without interpetiolar gland fields..... 12
            12. Leaflets crenate; fruit with epicarp glabrescent..... 11. *Tanaecium parviflorum*
            12'. Leaflets entire; fruit with epicarp velutinous..... 10. *Tanaecium dichotomum*

1. ***Amphilophium crucigerum*** (L.) L.G.Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 270: 2008.

Fig. 3a-g

Lianas; branches hexagonal, without interpetiolar gland fields, lepidote-pubescent, trichomes simple, stipitate and peltate; prophylls of axillary buds foliaceous. Leaves 2–3-foliolate; tendrils multifid, with an adhesive disk at the apex; petiole 2–4 cm long, pentagonal, lepidote-pubescent, trichomes simple, and peltate; petiolules 0.5–2.8 cm long, lepidote-pubescent, trichomes simple, stipitate and peltate; leaflet blade 2.7–8.4 × 2.4–6 cm, sub-chartaceous to chartaceous, cordiform to ovate, base sub-cordate to obtuse, apex cuspidate, lepidote-pubescent on both surfaces, trichomes simple, non-glandular and glandular, peltate and patelliform/cupular, margin entire. Inflorescences in terminal racemes, flowers in pairs, opposite; pedicel cylindrical, 3–5 mm long, lepidote-pubescent, trichomes simple non-glandular and glandular, peltate; calyx simple, 0.7–1.2 cm long, tubulose, truncate, shortly 5-lobed, apex acute, pubescent-lepidote outside, trichomes simple, glandular, peltate and patelliform/cupular, glabrous inside; corolla tubular-campanulate, tube 2.3–2.7 cm long, white, yellowish at mouth, somewhat fleshy, without conspicuous nectar guides, 5-lobes, 0.8–1 cm long; stamens included,

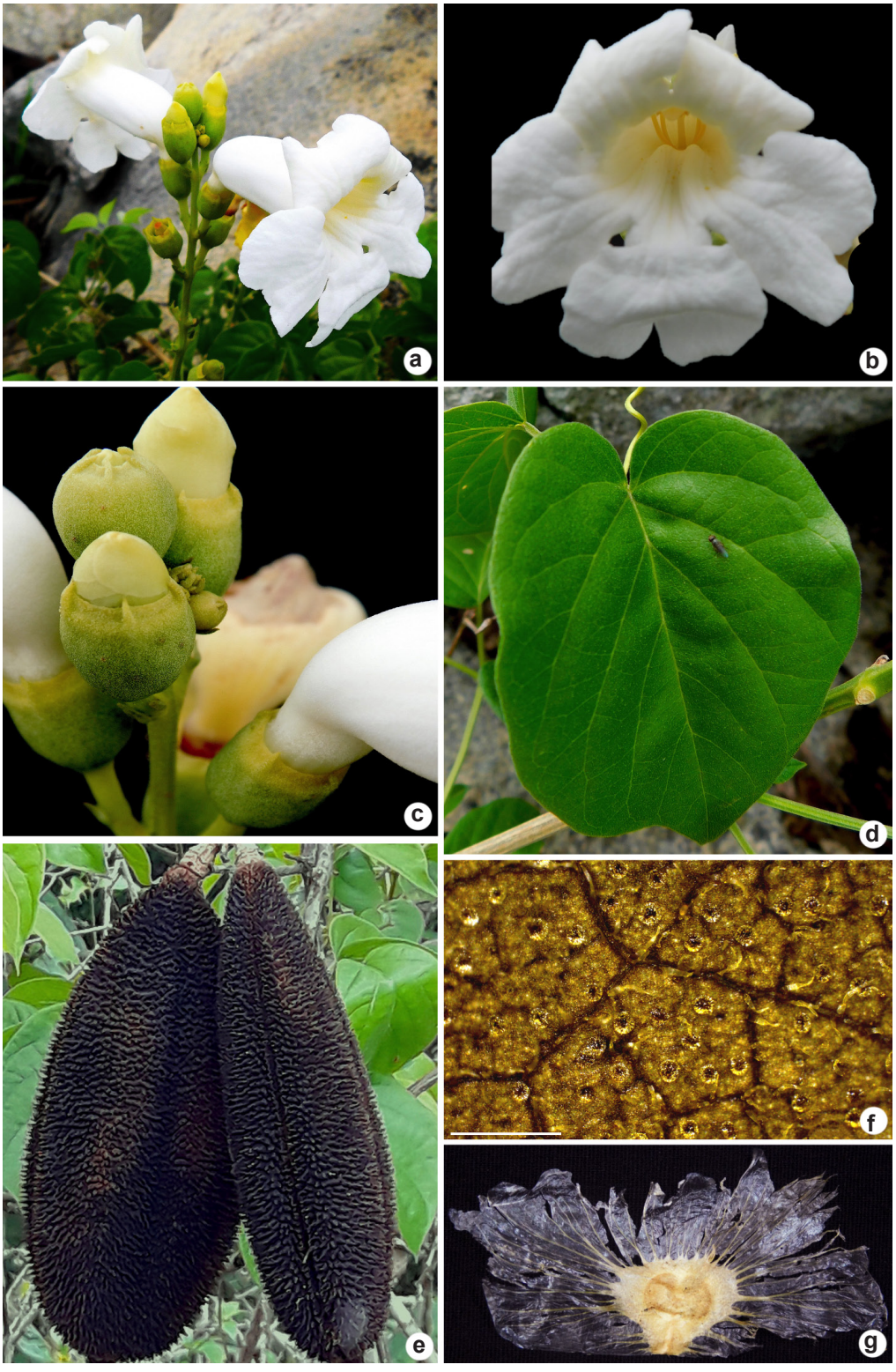

Figure 3 – a-g. *Amphilophium crucigerum* – a. inflorescence in a raceme; b. detail of corolla; c. inflorescence showing the simple calyx, with 5 short lobes at the rim; d. leaflets and tendrils; e. ripe fruits with muricate epicarp; f. detail of the abaxial surface of a leaflet, showing lepidote-pubescent indument; g. detail of papillate and winged seed. (a-g. *R. Lopes 135*). Photos by R. Lopes.

smaller pair 1.2–1.3 cm long, the larger pair 1.7–1.8 cm long, anthers ca. 3 mm long, non-forward-curved, 1-staminode, 5.5–6 mm long; ovary oblong-elliptic, 3–6 mm long, sessile, tomentose to villous; style 2.5–2.7 cm long, glabrous, stigma 2–3 mm long, included; disk nectariferous cupuliform, 2.5–3 mm diam., pilose on the upper edge. Capsule elliptic to oblong-elliptic, 12.5–16.2 × 4.5–4.8 cm, strongly muricate, non-stipitate, lepidote; seeds numerous, 2.5–3.2 × 4.3–6.5 cm, papillate, transverse-elliptic, light beige to brownish, winged, the wings papery, hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, 7-10.II.1998, *M.F. Agra et al. 5013* (JPB, MO); próximo às antenas da TELPA, 1,170 m, 07°15.140'S, 37°23.107'W, 15.IV.2018, *R. Lopes 135* (EAN, JPB).

Amphilophium crucigerum is broadly distributed throughout semideciduous and evergreen Neotropical forests (Pool 2007; Lohmann & Taylor 2014). In Brazil it occurs in all states and grows in Amazonia, Caatinga, Cerrado, Atlantic Forest, and Pantanal (Lohmann 2010). At the Pico do Jabre, it was found growing in rocky outcrops, above 1,100 m.

Amphilophium crucigerum can be recognized by the stems and branches 6-angled, multifid tendrils with an adhesive disk at the apex, corolla white (Fig. 3a-c), calyx truncate and shortly 5-lobed (Fig. 3c), and fruits muricate (Fig. 3e). It can be easily differentiated from *A. paniculatum* by its simple calyx (*vs*. double calyx in *A. paniculatum*; Fig. 4a), corolla white (*vs*. corolla rose to lilac in *A. paniculatum*; Fig. 4a), and muricate fruit (*vs*. ovate-elliptic and smooth fruit; Fig. 4b). Its flowers are often visited by flies.

This species was collected with flowers and fruits in February and April.

Fruits are used in the treatment of neuralgia, while seeds are combined with snakeskin and used to treat headaches (Bye 1979). The seeds are mixed with marrow's calf or deer and used to treat eye diseases (Bye 1979).

2. *Amphilophium paniculatum* (L.) Kunth, Nov. Gen. Sp. 3: 149. 1818 [1819]. Fig. 4a-b

Lianas; stems and branches 6-angled, without interpetiolar gland fields, lepidote-pubescent, trichomes simple and peltate; prophylls of axillary buds foliaceous. Leaves 2–3-foliolate; tendrils multifid, with an adhesive disk at the apex; petiole 1.2–4 cm long, pentagonal, lepidote, trichomes peltate; petiolules 0.3–2.2 cm long, lepidote-pubescent, trichomes simple and peltate; leaflet blade 3.3–8 × 1.9–5 cm, chartaceous, ovate to elliptic, base cuneate, apex slightly acuminate to acuminate, lepidote to densely-lepidote in both surfaces, trichomes glandular peltate and patelliform in both surfaces, margins entire. Inflorescences in terminal panicle; pedicel cylindrical, 3–8 mm long, glabrescent; calyx double, external cyathiform, 0.6–1 cm long, pubescent-lepidote, trichomes simple and peltate, internal 1–1.5 cm long, pilose on both surfaces; corolla infundibular, tube 2.5–3 cm long, lilac to pink, yellow at mouth, somewhat fleshy, without conspicuous nectar guides, 4–lobes, 0.6–1.1 cm long; stamens included, the smaller pair 1.2–1.3 cm long, the larger pair 1.9–2 cm long, anthers ca. 3 mm long, non-forward-curved, 1-staminode, ca. 4 mm long, ovary oblong-elliptic, 5–7 mm long, sessile, glabrous, style 1.7–1.8 cm long, glabrous, stigma 3–4 mm long, included; disk nectariferous cupuliform, ca. 1 mm diam., glabrous. Capsule oblong-elliptic, 7.5–9.5 × 4.2–4.5 cm, smooth, non-stipitate, densely lepidote; seeds numerous, 2–4.4 × 1–1.4 cm, papillate, transverse-elliptic, brown, winged, the wings chartaceous and hyaline.

Examined material: Maturéia, Pico do Jabre, Serra de Teixeira, Distr. Maturéia, 07°11'10"S, 37°08'22"W, 1,190 m, 25-27.II.1994, *M.F. Agra et al. 2688* (JPB); ao norte da sede da Telpa, em direção leste, 07°11'10"S, 37°25'53"W, 800-1,010 m, 28-30.I.1998, *M.F. Agra & P.C. Silva 4873* (JPB).

Additional examined material: BRAZIL. SÃO PAULO: São José do Rio Preto/Mirassol, ecological station of Northwest São Paulo, 20°48'36"S, 49°22'50"W, 1-22.VIII.1996, *Rezende 490/503* (SJRP).

Amphilophium paniculatum is broadly distributed from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and grows in Amazonia, Caatinga, Cerrado, Atlantic Forest, and Pantanal (Lohmann 2010). At the Pico do Jabre, it was found growing on forest edges and sandy substrate at around 900 m altitude. This is the first record of *A. paniculatum* for the state of Paraíba.

Amphilophium paniculatum can be easily recognized by its stems and branches 6-angled, double cyathiform calyx, leaflet blades lepidote to densely lepidote and woody and smooth fruit. It can be easily differentiated from *A. crucigerum* by its double calyx (Fig. 4a) (*vs*. simple in *A. crucigerum*; Fig. 3c), corolla rose to lilac (Fig. 4a) (*vs*. white to whitish in *A. crucigerum*; Fig. 3a-b), and ovate-elliptic and smooth fruit (Fig. 4b) (*vs*. muricate in *A. crucigerum*; Fig. 3e). Ants were observed visiting its flowers.

This species was collected with flowers from January to February and fruits from March to July.

3. ***Anemopaegma citrinum*** Mart. *ex* DC., Prod. 9: 189. 1845. Fig. 4c-e

Lianas; branches irregularly cylindrical, with interpetiolar gland fields, glabrescent to glabrous, trichomes simple; prophylls of axillary buds foliaceous. Leaves 2–3-foliolate; tendrils trifid, without an adhesive disk at the apex, non-uncinate; petiole 1.1–6.5 cm long, cylindrical, sparse lepidote-glabrescent, trichomes simple and peltate; petiolules 0.5–1.8 cm long, glabrescent to pilose, trichomes simple; leaflet blade 3–11 × 1.7–4.8 cm, chartaceous, oblong-elliptic, base obtuse, apex acute to acuminate, adaxial surface lepidote, abaxial surface densely lepidote, trichomes non-glandular simple and glandular peltate in both surfaces, patelliform and patelliform/cupular in abaxial surface, margin entire. Inflorescences in axillary racemes; pedicels cylindrical, 0.5–1.5 cm long, glabrescent; calyx simple, 0.6–1 cm long, cupuliform, truncate, glabrescent to glabrous outside, trichomes simple, and sparsely lepidote inside, trichomes peltate; corolla infundibular, tube 3–5.7 cm long, yellowish, somewhat fleshy, without nectar guides, 5-lobes, 0.6–1.8 cm long; 4(–5) stamens included, the smaller pair 1.6–2.5 cm long, the larger pair 2.5–3.5 cm long, anthers 3–4 mm long, non-forward-curved, 1-staminode, 0.6–1 cm long; ovary elliptic, 2–3 mm long, stipitate, lepidote, trichomes peltate, style 1.6–4 cm long, glabrous, stigma 1.5–3 cm long, included; disk nectariferous pulvinate, 1.5–2 mm diam., glabrous. Capsule elliptic to sub-orbicular, smooth, 4.8–8 × 2.5–5.4 cm, stipitate, sparse lepidote; seeds numerous, 2–3 × 3–3.8 cm, semicircular, winged, the wings membranaceous and hyaline.

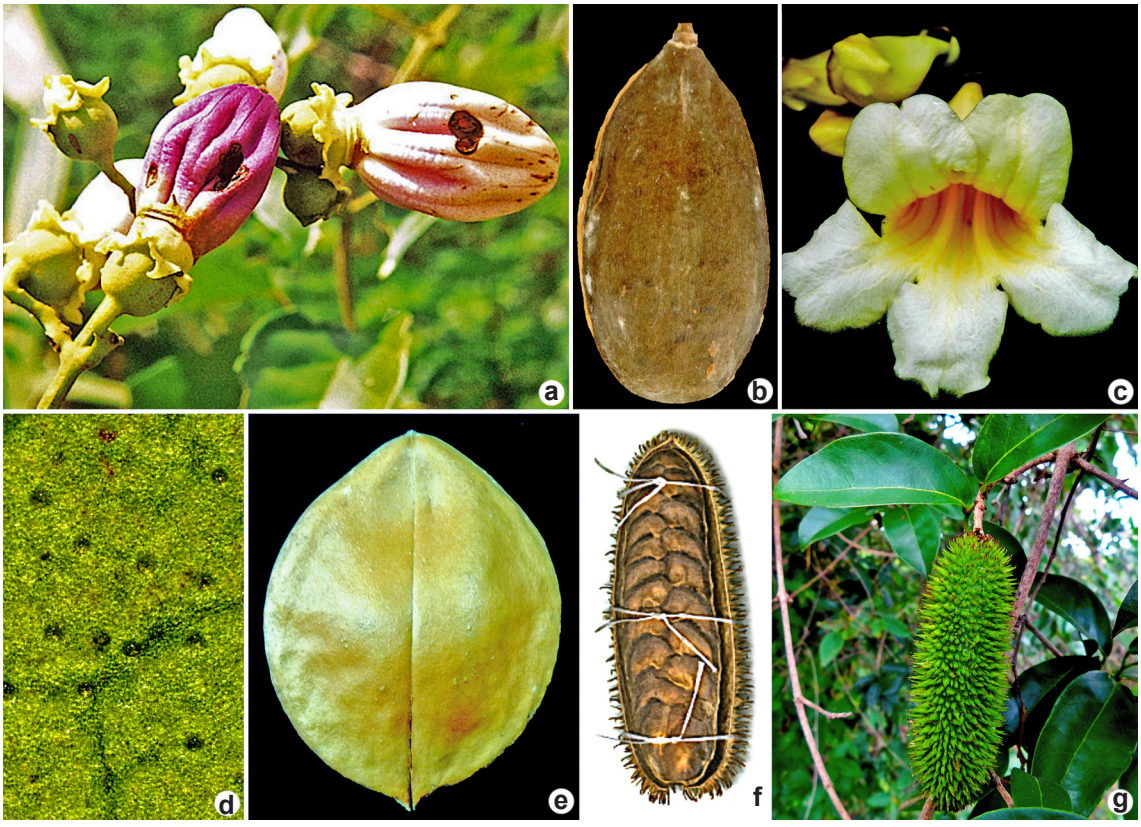

Figure 4 – a-b. *Amphilophium paniculatum* – a. inflorescence showing the flowers with a double calyx; b. woody fruit with smooth epicarp. c-e. *Anemopaegma citrinum* – c. detail of the flower; d. detail of the lepidote indument on the abaxial leaflet blade; e. fruit woody, elliptic to sub-orbicular with smooth epicarp. f-g. *Bignonia ramentacea* – f. detail of open dried fruit with winged seeds; g. fruit on the branch showing echinate epicarp. (a-b. *M.F. Agra et al. 2688*; c. *R. Lopes 239*; d-e. *R. Lopes 255*; f. *Agra et al. 4022*; g. *R. Lopes 253*). Photos: a. M.F. Agra; b, c, d, e, g. R. Lopes.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, 07°11'10"S, 37°25'53"W, 1,190 m, 25-27.II.1994, *M.F. Agra et al. 2629* (JPB); 07°12'10"S, 37°25'54"W, 800-1,010 m, 30.X.1997, *M.F. Agra & Sr. Paulo 4830* (JPB, MO); 07°15'54"S, 37°22'33"W, 1,200 m, 2.XII.2017, *J.M.P. Cordeiro 1254* (EAN); 07°15.50'S, 37°23.069'W, 1,200 m, 13.III. 2018, *R. Lopes 239* (EAN, JPB); margem da floresta, 07°15.53'S, 37°23.160'W, 945 m, 18.IX.2018, *R. Lopes 255* (EAN, JPB).

Anemopaegma citrinum is restricted to dry forests of Bolivia and Brazil (Lohmann & Taylor 2014). In Brazil, it occurs in the states of Bahia, Maranhão, Minas Gerais, Paraíba, Pernambuco, and Piauí, where it grows predominantly in Cerrado vegetation (Lohmann 2010; Lohmann & Taylor 2014; Lohmann *et al.* 2021). At the Pico do Jabre, it was found growing on forest with sandy soils or granitic rocks, at 700 m and above.

Anemopaegma citrinum can be recognized by its yellowish corolla (Fig. 4c), truncate calyx (Fig. 2b), and elliptic to sub-orbicular, stipitate and smooth capsule (Fig. 4e). Young individuals of *A. citrinum* have trifoliolate leaves devoid of tendrils, whereas adult individuals have leaves 2–3-leaflets with or without tendrils. Ants and flies were observed visiting its flowers.

This species was collected with flowers from February to March and fruits in September, October, and December.

4. *Bignonia ramentacea* (Mart. *ex* DC.) L.G.Lohmann in Lohmann & Taylor, Ann. Missouri Bot. Gard. 99(3): 422. 2014. Fig. 4f-g

Lianas; branches cylindrical in young plant to slightly tetragonal when mature, lenticellate, without interpetiolar gland fields, pilose when young, trichomes simple; prophylls of the axillary buds triangular. Leaves (1–)2-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; leaflet pubescent when young; petiole 0.2–2.1 cm long, pentagonal, pilose or lepidote-glabrescent, trichomes simple, and peltate; petiolules up to 1.3 cm long, pubescent, trichomes simple and glandular-peltate; leaflet blade 1.2–4.8 × 2.1–11.2 cm, sub-chartaceous to chartaceous, base elliptic to rounded, apex apiculate, adaxial surface sparsely lepidote, abaxial surface densely lepidote, trichomes non-glandular simple and glandular peltate in both surfaces, patelliform only on the abaxial surface, margins entire. Inflorescences in terminal cymes, pedicels cylindrical, 1–7 cm long, pubescent-lepidote, trichomes simple and peltate; calyx simple, 0.8–0.9 cm long, cupuliform, 5(–7)-lobes, apex apiculate, pubescent-lepidote externally, trichomes simple and peltate, glabrescent inside; corolla infundibular, tube 3.5–4.5 cm long, rose to purple, membranaceous, with conspicuous nectar guides, 5-lobes, 1.5–2.5 cm long; 4 stamens included, the smaller pair 1.1–1.7 cm long, the larger pair 1.7–2.5 cm long, anthers ca. 8 mm long, non-forward-curved, 1-staminode, ca. 9 mm long; ovary cylindrical, 2.9–3 mm long, sessile, glabrous, style 2.6–3.2 cm long, pilose at the base, trichomes simples, stigma 2–3 mm long, included; disk nectariferous inconspicuous, ca. 1 mm diam., glabrous. Capsule oblong, 1.7–3 × 5–9.5 cm, echinate, spines 7–8 mm long, non-stipitate; seeds numerous, asymmetric, ca. 2 × 4.5 cm, brown, winged, the wings membranaceous and hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, ao norte da sede da Telpa, em direção leste, 07°11'10"S, 37°25'53"W, 900-1,000 m, 12.VII.1997, *M.F. Agra et al. 4022* (JPB, MO); margem da primeira rocha da trilha do caboclo, 07°15'56.8" S, 37°23'07.3"W, 818 m, 8.VI.2018, *R. Lopes 253* (EAN).

Bignonia ramentacea occurs in dry forests of Bolivia, Paraguay, and Brazil (Zuntini 2014). In Brazil, it occurs in the states of Bahia, Ceará, Mato Grosso do Sul, Minas Gerais, Paraíba, Pernambuco, and Rio Grande do Norte, where it grows in Caatinga and Cerrado (Zuntini 2014). At the Pico do Jabre, it was found growing on forests.

Bignonia ramentacea can be recognized by its branches cylindrical to tetragonal, not winged; leaflet pubescent when young, with apex apiculate and corolla with conspicuous nectar guides. This species resembles *B. sciuripabulum*, from which it can be distinguished by the leaflets sub-chartaceous to chartaceous (*vs*. membranaceous to chartaceous in *B. sciuripabulum*), pubescent petioles (*vs*. glabrescent in *B. sciuripabulum*), leaflets elliptic to rounded at the base (*vs*. elliptic to obovate in *B. sciuripabulum*) and apiculate at the apex (*vs*. acuminate apex in *B. sciuripabulum*), inflorescence few-flowered (*vs*. inflorescence many-flowered in *B. sciuripabulum*), and smaller corollas (tube 3.5–4.5 cm *vs*. 4.5–5 cm in *B. sciuripabulum*). In addition, the pedicels of *B. ramentacea* are pilose in young individuals, while those of *B. sciuripabulum* are glabrescent. This species shows strong variation in the corolla color within a single individual and even within a single inflorescence.

This species was collected with flowers and fruits from June to July.

Bignonia ramentacea is known in folk medicine as "banheira," the decoction of its leaves is used to treat cough (Cartaxo *et al*. 2010).

5. ***Bignonia sciuripabulum*** (Hovel.) L.G.Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 272. 2008. Fig. 2f

Lianas; stem and branches 4-angled, winged, lenticellate, without interpetiolar gland fields, glabrescent to glabrous, trichomes simple; prophylls of axillary buds triangular. Leaves (1–)2-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 0.4–3 cm long, pentagonal, glabrescent to glabrous, trichomes simple; petiolule 0.4–1.4 cm long, glabrescent, trichomes simple; leaflet blade 1.8–8.7 × 3.3–14.5 cm, membranaceous to chartaceous, elliptic to obovate, often asymmetrical, base rounded to cuneate, apex acuminate, rare acute, sparse lepidote in both surfaces, trichomes glandular peltate on both surfaces, and patelliform on the abaxial surface, margins entire. Inflorescences in terminal racemes; pedicels cylindrical, 1.5–4.7 cm long, lepidote, trichomes peltate; calyx simple, 0.8–1.1 cm long, cupuliform, 5-lobed, apex apiculate, pubescent on the margin, trichomes simple and peltate; corolla infundibular, tube 4.5–5 cm long, rose to purple, membranaceous, with conspicuous nectar guides, 5-lobes, rounded, 1.7–2.6 cm long; 4 stamens included, the smaller pair 1.9–2 cm long, the larger pair 2–2.9 cm long, anthers 0.7–8 mm long, non-forward-curved, 1-staminode, ca. 1 cm long; ovary cylindrical, 3–4 mm long, sessile, glabrous, style 3–3.3 cm long, pilose at the base, trichomes simple, stigma ca. 3 mm long, included; disk nectariferous inconspicuous, ca. 1 mm diam., glabrous. Capsule oblong, 2.5–3 × 12–16.4 cm, echinate, non-stipitate; seeds numerous, 1.5–1.7 × 4.7–4.9 cm, brown, winged, asymmetric, the wings membranaceous and hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, ao sul da sede da Telpa, 07°11'10"S, 37°25'53"W, 700-800 m, 18.I.1997, *M.F. Agra et al. 3935* (JPB, MO); 800-1,010 m, 20-23.XII.1997, *M.F. Agra et al. 4365* (JPB, MO); 800-1,010 m, 18-21.I.1998, *M.F. Agra et al. 4654* (JPB, MO); 700-1,197 m, 18-21.I.1998, *M.F. Agra et al. 4790* (JPB, MO); margem da floresta, 07°15'37.2"S, 37°23'24.8"W, 1,150 m, 13.III.2018, *R. Lopes 238* (EAN).

Additional examined material: BRAZIL. BAHIA: Guaratinga, 8.7 km de São João do Sul, 16°35'49"S, 39°54'50"W, 25.IX.2004, *W. Thomas 14257* (CEPEC); Esplanada, Algodão, 12°10'S, 37°58'W, 12.XII.2012, *A. Popovik 1316* (HUEFS).

Bignonia sciuripabulum is broadly distributed through South America (Zuntini 2014). In Brazil, it occurs in nearly all states, where it grows in Amazonia, Caatinga, Cerrado, Atlantic Forest, and Pantanal (Lohmann 2010). At the Pico do Jabre, it grows in areas with sandy soil.

Bignonia sciuripabulum can be recognized by its branches 4-angled, winged, leaflets glabrous to glabrescent, with apex acuminate, and corolla with conspicuous nectar guides. It can be confused with other species of *Bignonia* that occur in the same locality (see taxonomic comments on *B. ramentacea*).

This species was collected with flowers from December to January and March.

6. ***Cuspidaria lateriflora*** (Mart.) DC., Prodr. 9: 179. 1845. Fig. 5a-i

Lianas; branches cylindrical, striate, with interpetiolar gland fields, pilose to glabrous, trichomes simple and peltate; prophylls of axillary buds triangular. Leaves 3-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 1.5–2.5 cm long, hexagonal, dense tomentose-lepidote, trichomes simple, stipitate, and peltate; petiolules 0.4–1.5 cm long, dense tomentose-lepidote, trichomes simple, stipitate, and peltate; leaflet blade 1.7–3.8 × 0.8–1.8 cm, membranaceous, ovate to elliptic, base obtuse, apex cuspidate, pubescente-lepidote in both surfaces, trichomes non-glandular simple, and glandular peltate on both surfaces, stipitate on the adaxial surface, patelliform only on the abaxial surface, margins entire. Inflorescence in axillary racemes; pedicels cylindrical, 3–7 mm long, pubescent, trichomes simple, stipitate and peltate; calyx simple, 5–8 mm long, tubular, 5-lobed, apex cuspidate, pubescent outside, trichomes simple and stipitate, glabrescent to glabrous inside; corolla infundibular, tube 2.5–3.3 cm long, pink, membranaceous, without nectar guides, 5-lobes, 0.7–1.2 cm long; 4 stamens included, the smaller pair 1.2–1.4 cm long, the larger pair 1.5–1.7 cm long, anthers ca. 2 mm long, curved-forward, 1-staminode, ca. 2.5 mm long; ovary linear-cylindrical, 2.5–3 mm long, sessile, pubescent, trichomes simple, style 2–2.5 cm long, glabrous, stigma ca. 2 mm long, included; disk nectariferous cupuliform, ca. 0.5 mm diam., glabrous. Capsule linear and flattened, 20–26 × 1.2–1.4 cm, smooth, non-stipitate; seeds numerous, 0.6–0.7 × 2.1–2.3 cm, linear-oblong, brown, winged, the wings membranaceous and hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, Margem da floresta, 07°11'10"S, 37°25'53"W, 700-800 m, 18.I.1997, *M.F. Agra et al. 3932* (JPB, MO).

Additional examined material: BRAZIL. MINAS GERAIS: Uberaba, 1848, *A.F. Regnell 11149* (K). SERGIPE: Poço Redondo, Santa Rosa, estrada para Quilombos, 31.X.2014, *J.M.P. Cordeiro et al. 505* (EAN). PERNAMBUCO: Buíque, Brejo, 08°32'00"S, 37°15'00"W, 20.VI.2007, *J.S. Silva et al. 217* (UFP).

Cuspidaria lateriflora occurs in wet and dry forests from Peru, Bolivia, Paraguay, and Brazil (Lohmann & Taylor 2014). In Brazil, it is broadly distributed, and found in most states, where it grows in Amazonia, Caatinga, Cerrado, and the Atlantic Forest (Lohmann & Taylor 2014). At the Pico do Jabre, it was collected only once between 700–850 m of elevation, growing on forest edges. It is a heliophyte species, growing in sandy substrate.

Cuspidaria lateriflora can be distinguished by branches with interpetiolar gland fields, the ovate to elliptic and membranaceous leaflets, petiole hexagonal, and anthers with forward-bending thecae.

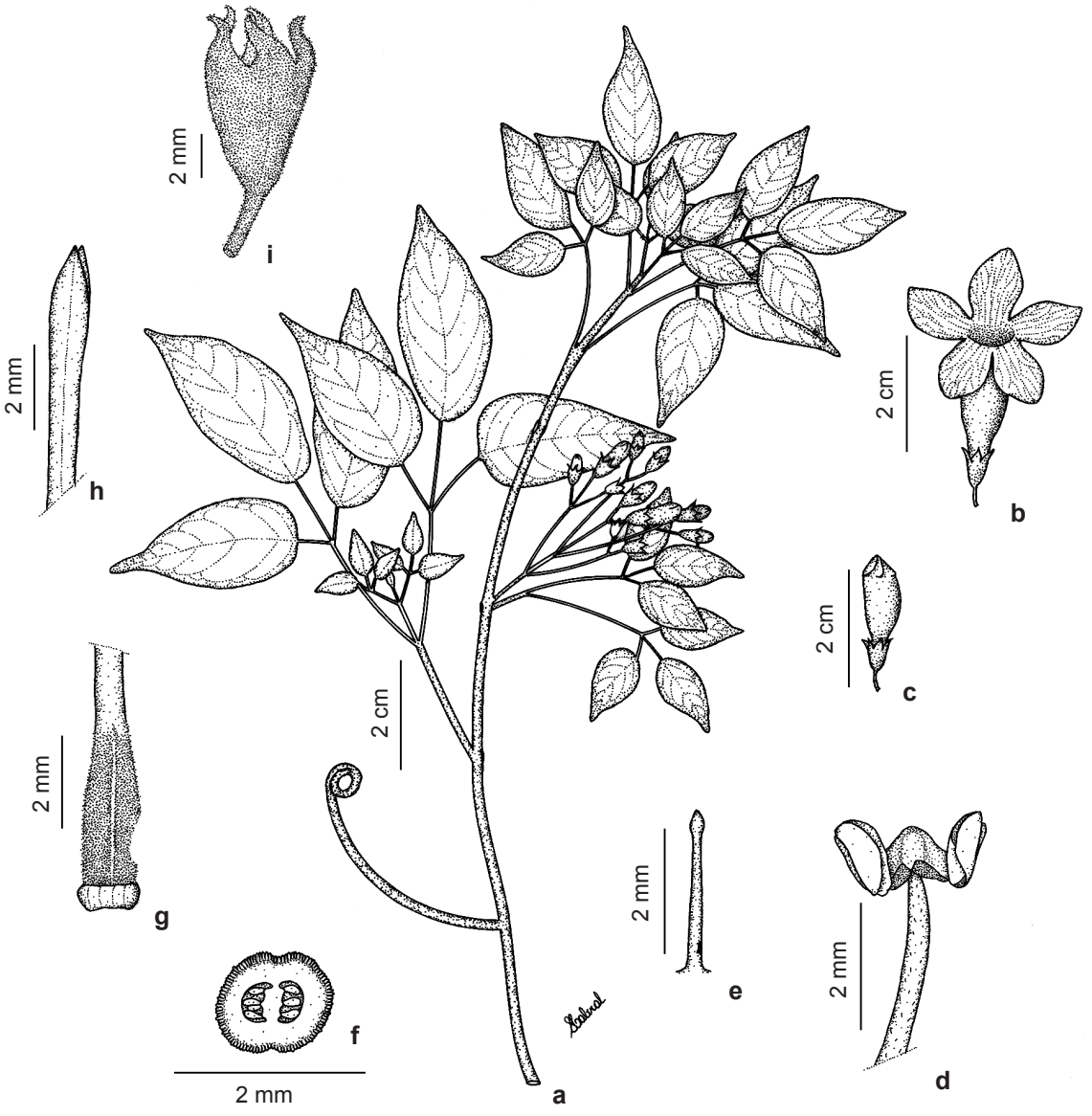

Figure 5 – a-i. *Cuspidaria lateriflora* – a. flowering branch showing 3-foliolate leaves; b. detail of flower; c. flower bud; d. stamen with anthers curved-forward; e. style; f. ovary in transverse section; g. ovary linear-cylindrical and nectary disk cupuliform; h. detail of stigma; i. calyx simple and 5-lobed. (a-i. *Agra et al. 3932*).

This species was collected with flowers in January.

7. *Dolichandra unguis-cati* (L.) L.G.Lohmann, Nuevo Cat. Fl. Vasc. Venez. 273. 2008. Fig. 6a-d

Lianas; branches cylindrical, with interpetiolar gland fields, glabrous; prophylls of axillary buds subulate. Leaves 2-foliolate; tendrils trifid, uncinate; petiole 1.3–5 cm long, cylindrical, glabrescent to glabrous, trichomes simple; petiolules 1–3 cm long, glabrescent to glabrous, trichomes simple; leaflet blade 5–10 × 2.3–5.5 cm, chartaceous, elliptic, base obtuse or oblique, apex acuminate, sparse lepidote on both surfaces, trichomes glandular peltate on both surfaces, patelliform on the abaxial surfaces, margin entire and crenate to dentate in the upper half of the leaflet when young. Inflorescences in axillary thyrses; pedicel cylindrical, 1.9–5 cm long, glabrescent; calyx simple, 1–1.3 cm long, campanulate, truncate, sparse lepidote to glabrous, trichomes peltate and patelliform; corolla infundibular, tube 4.3–5.1 cm long, dark-yellow, membranaceous, without conspicuous nectar guides, 5-lobes, 1.5–2.1 cm long; 4 stamens included, the smaller pair 1.2–2.5 cm long, the larger pair 1.9–2.5 cm long, anthers 3–8 mm long, non-forward-curved, 1-staminode, 0.5–1.5 mm long; ovary linear, 5–10 mm long,

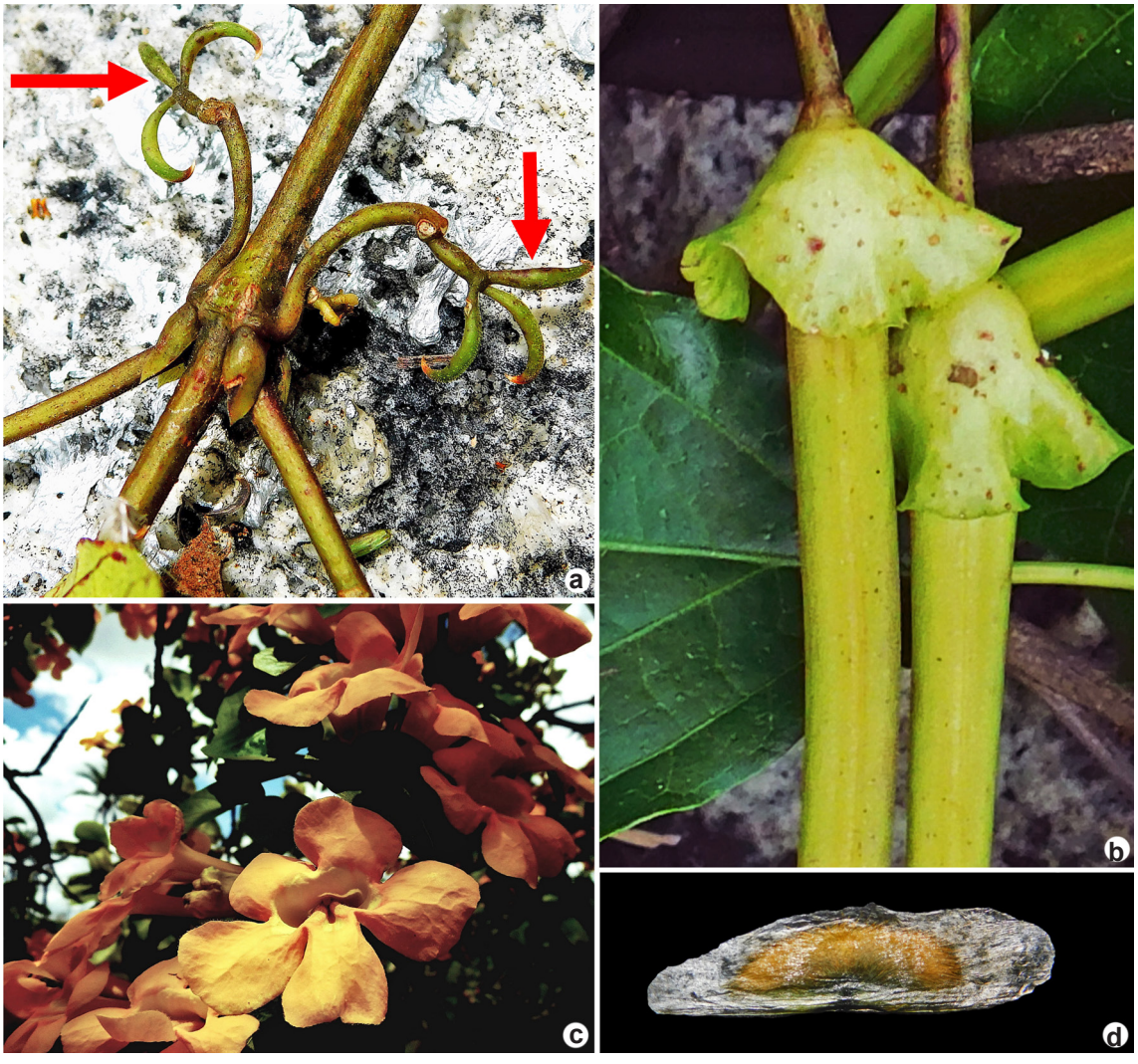

Figure 6 – a-d. *Dolichandra unguis-cati* – a. branch with tendrils uncinate at the apex; b. branch with young fruits with campanulate and persistent calyces; c. inflorescence; d. detail of winged seed. (b. *R. Lopes 246*). Photos: a. J. Cordeiro; b, c, d. R. Lopes.

sessile, glabrous, style 1.3–2.8 cm long, glabrous, stigma 2–3 mm long, included; disk nectariferous ca. 1 mm diam. Capsule linear and flattened 28–45 × 0.9–1 cm, smooth, non-stipitate, glabrous; seeds numerous, 3–3.7 × 0.7–0.8 cm, oblong, brown, winged, the wings membranaceous and hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, ao sul da sede da Telpa, 07°11'10"S, 37°25'53"W, 700-900 m, 12.VII.1997, *M.F. Agra et al. 4113* (JPB, MO); 18-21.I.1998, *M.F. Agra et al. 4792* (JPB, MO); 800-1,010 m, 7-10.II.1998, *M.F. Agra et al. 5048* (JPB, MO); margem da floresta, 07°15.267'S, 37°23.25'W, 1,084 m, 3.V.2018; *R. Lopes 246* (EAN, JPB).

Additional examined material: BRAZIL. BAHIA: Ilhéus, CEPLAC/CEPEC - Quadra H, 14°45'27"S, 39°13'50"W, 10.XI.2010, *L. Daneu et al. 418* (RB).

Dolichandra unguis-cati is broadly distributed throughout the Neotropics (Fonseca *et al*. 2017). In Brazil, it occurs in all states and phytogeographic domains (Lohmann 2010). At the Pico do Jabre, *D. unguis-cati* grows in a range of altitudes, from the base to the top of the study area, on forest edges, where it grows on granitic rocks.

Dolichandra unguis-cati is easily recognized by its trifid tendrils with uncinate apices (Fig. 6a), 2-foliolate leaves, calyx persistent in fruit (Fig. 6b), and corolla yellow (Fig. 6c). Its adventitious roots are used to attach to rocks and tree trunks. *Dolichandra unguis-cati* can be easily distinguished from *D. quadrivalvis* by the linear and flattened fruits (*vs*. oblong, inflated, and four-parted in *D. quadrivalvis*; Fonseca *et al*. 2017).

No flowering material of *D. unguis-cati* was ever collected at Pico do Jabre. *Dolichandra unguis-cati* is known to flower from September to January (Fonseca *et al*. 2017). At the Pico do Jabre, it was collected with fruits in January, February, May, and July.

Aerial parts of *D. unguis-cati* are used as an anti-inflammatory, anti-malarial, to treat venereal diseases (Duarte *et al*. 2000), and snakebites (Houghton & Osibogon 1993). In Argentina, this species is used in folk medicine to treat gastrointestinal problems, vaginal diseases, anuria, and bloody urine (Hilgert 2001).

8. *Pyrostegia venusta* (Ker Gawl.) Miers, Proc. Roy. Hot. Soc. London 3: 188. 1863.Figs. 2d; 7a-c

Lianas; branches cylindrical, striated, without interpetiolar gland fields, glabrescent to glabrous; prophylls foliaceous. Leaves 2–3-foliolate; tendrils trifid, without an adhesive disk at the apex, non-uncinate; petiole 0.6–4 cm long, pentagonal, lepidote-glabrescente, trichomes simple, and peltate; petiolules up to 1.2 cm long, sparse lepidote-pubescent; leaflet blade 1.5–6.7 × 1–5.3 cm, chartaceous, elliptic to oval-elliptic, base rounded, apex cuspidate, adaxial surface lepidote, trichomes glandular peltate and patelliform, abaxial surface dense lepidote, trichomes glandular peltate, patelliform, and patelliform/cupular, margin entire. Inflorescences in terminal panicles; pedicels canaliculate, 0.6–2.1 cm long, glabrescent, trichomes simple; calyx simple, 4–7 cm long, campanulate, 5-lobed, apex cuspidate, lepidote outside, trichomes peltate, glabrous to glabrescent inside, trichomes simple at margin; corolla tubular to infundibular, tube 4.5–7.6 cm long, orange, membranaceous, without nectar guides, 5-lobes, 0.6–2.2 cm long; 4 stamens exserted, the smaller pair 4.6–6.5 cm long, the larger pair 5.7–7.5 cm long, anthers 3–4 mm long, non-forward-curved, 1-staminode, 5–7 mm long; ovary linear-oblong, 4–6 mm long, sessile, lepidote, trichomes peltate, style 4.8–7.5 cm long, glabrous, stigma 2–3 mm long, exserted; disk nectariferous cupuliform, ca. 2 mm diam., glabrous. Capsule linear, flattened, 18–28 × 0.9–1.5 cm, smooth, non-stipitate, sparse lepidote; seeds numerous, 0.8–1.2 × 2–3 cm, linear-oblong, brown, winged, the wings membranaceous and hyaline.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, próximo às antenas, no topo, 07°11'10"S, 37°25'53"W, 800-1,010 m, 27-29.IX.1997, *M.F. Agra et al. 4218, 4353, 4356* (JPB, MO); 20-23.XII.1997, *M.F. Agra et al. 4371, 4398* (JPB, MO); próximo às antenas, no topo, 07°12'10"S, 37°25'54"W, 17-20.XI.1997, 800-1,010 m, *M.F. Agra 4480 & P.C. Silva* (JPB, MO); 07°15.182'S, 37°23.077'W, 1,195 m, 18.IX.2018, *R. Lopes 257* (EAN).

Pyrostegia venusta occurs throughout South America and is frequently cultivated throughout the tropics (Pool 2008). In Brazil, it occurs in all Brazilian states and phytogeographic domains (Lohmann 2010). It is broadly distributed and abundant at the Pico do Jabre, with most individuals occurring at higher altitudes.

Pyrostegia venusta can be easily recognized by the dense inflorescences with showy and orange corolla with exserted stigma and stamens (Figs. 2d; 7a). Hummingbirds and ants were frequently observed visiting its flowers.

This species was collected with flowers and fruits in September, November, and December.

The aerial parts of *Pyrostegia venusta* are used as an infusion or decoction (Veloso *et al*. 2010). Its flowers are used to treat vitiligo, and

the stems are used to treat diarrhea (Ferreira *et al*. 2000). The decoction of the aerial parts is used to treat coughs and flus (Kumar *et al*. 2013).

9. *Tanaecium cyrtanthum* (Mart. *ex* DC.) Bureau & K.Schum., *Fl. bras*. 8(2): 186. 1896.

Fig. 7d-g

Lianas; branches cylindrical, lenticellate, with interpetiolar gland fields, sparse lepidote, trichomes peltate; prophylls of axillary buds subulate and bromeliad-like. Leaves 2–3-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 0.6–4.3 cm long, cylindrical, glabrescent, trichomes simple; petiolule 0.1–1.6 cm long, lepidote-pubescent, trichomes simple and peltate; leaflet blade 1.5–5.4 × 0.8–3.5 cm, membranaceous to sub-chartaceous, elliptic to large elliptic, ovate to obovate, base rounded or sub-rounded, apex acute, cuspidate or emarginate, sparse lepidote-glabrescent on both surfaces, trichomes non-glandular simple, glandular patelliform, and peltate on both surfaces, margin entire. Inflorescences in terminal thyrse, pedicels irregularly cylindrical, 4–8 mm long, sparse to dense lepidote; calyx simple, 4–8 mm long, campanulate, irregularly 5-lobed, apex

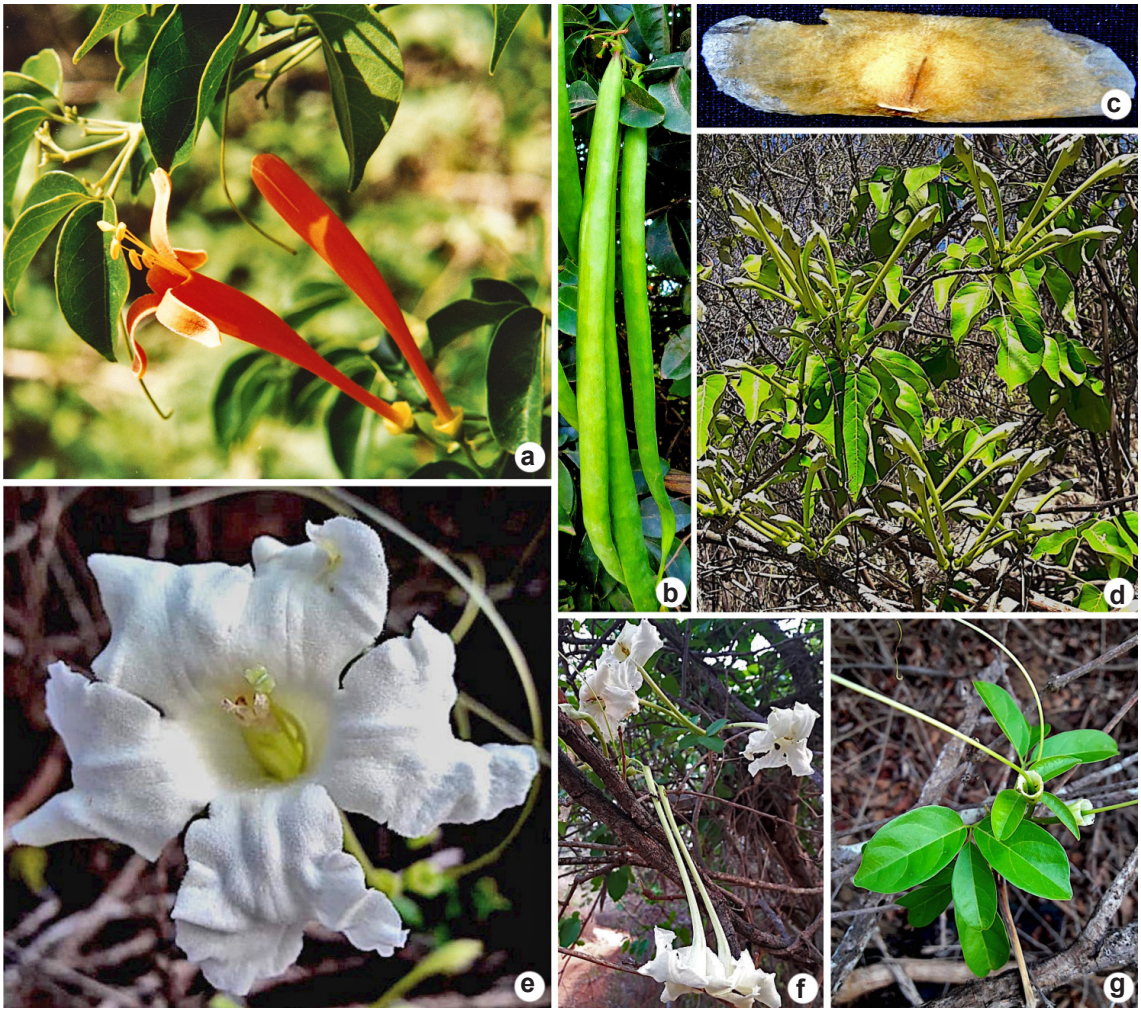

Figure 7 – a-c. *Pyrostegia venusta* – a. flower bud and flower with stamens and stigma exserted; b. immature fruits with smooth epicarp; c. seed winged, linear-oblong. d-f. *Tanaecium cyrtanthum* – d. branch with flower buds; e. flower with stamens and stigma exserted; f. inflorescence showing long-tubed corollas. g. detail of branch showing calyces with styles, without corollas. (a. *M.F. Agra et al. 4371*; b-d. *R. Lopes 257*; e-g. *R. Lopes 263*). Photos: a. M.F. Agra; b, c, d, e, f, g. R. Lopes.

cuspidate, lepidote, trichomes patelliform, showy, outside, short trichomes inside; corolla tubular, tube 6.5–9.5 cm long, white to whitish, membranaceous to slightly fleshy, without nectar guides, 5-lobes, 1.3–1.6 cm long; 4 stamens exserted, the smaller pair ca. 1.1 cm long, the larger pair ca. 1.7 cm long, anthers ca. 9 mm long, non-forward-curved, 1-staminode, 6 mm long; ovary cylindrical, 3 mm long, sessile, lepidote, trichomes peltate, style 6.5–10.5 cm long, lepidote at the base, stigma 3 mm long, exserted; disk nectariferous globose, ca. 3 mm diam., glabrous. Capsule linear-cylindrical, 3.2–3.8 × 17–30.2 cm, lenticelate, non-stipitate, sparse lepidote; seeds numerous, 1.9–2.7 × 6.7–9.2 cm, asymmetrical, brownish, winged, the wings membranaceous and hyaline.

Examined Material: Maturéia, Serra de Teixeira, Pico do Jabre, margem esquerda da subida, 07º15'34.8"S, 37º23'08.4"W, 3.I.2018; *R. Lopes 263* (EAN).

Additional examined material: BRAZIL. RONDÔNIA: Nova Mamoré, Estrada linha 31, direção ao final da Serra do Pacás Novos, beira da estrada, 10°27'38"S, 64°41'19"W, 183 m, 11.V.2013, *H. Medeiros et al. 1239* (NY). GOIÁS: São Domingos, Rio São Domingos, estrada de chão entre Vazante e São Domingos, 13°28'16"S, 46°34'29"W, 400 m, 16.VI.2000, *Oliveira et al. 1102* (K).

Tanaecium cyrtanthum is distributed through dry vegetation types in Bolívia, Brazil, and Paraguay (Frazão & Lohmann 2019). In Brazil, it is distributed through the states of Ceará, Rio Grande do Norte, Pernambuco, Bahia, Goiás, and Mato Grosso do Sul where it occurs in Caatinga and Cerrado (Frazão & Lohmann 2019). *Tanaecium cyrtanthum* is here recorded for the first time for the state of Paraíba. At the Pico do Jabre, it was collected only once, growing up to 945 m altitude in areas with sandy soils at forest edges.

Tanaecium cyrtanthum is semi-deciduous, losing its leaves while flowering. The species can be easily recognized by the long tubes and white corollas (Fig. 7e-f) that are easily lost, leaving the stamens and the styles exposed (Fig. 8e). This species differs from the other two species of *Tanaecium* that occur in the area by the leaflets with entire margin (*vs.* crenate margin in *T. parviflorum*), long-tubular and white corolla (*vs.* infundibular and pink in *T. dichotomum* and *T. parviflorum*), and fruit linear-cylindrical (*vs.* flattened and densely villous in *T. dichotomum* and flattened and glabrescent in *T. parviflorum*).

This species was collected with flowers in January.

10. *Tanaecium dichotomum* (Jacq.) Kaehler & L.G.Lohmann, Taxon 68(4): 765. 2019.

Fig. 8a-c

Lianas; branches cylindrical, lenticelate, without interpetiolar gland fields, velutinous when young; prophylls of axillary buds triangular. Leaves 2–3-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 1.7–5.2 cm long, cylindrical, velutinous and sparse-lepidote, trichomes simple, and peltate; petiolules 0.1–1.1 cm long, villous and sparse-lepidote, trichomes simple, and peltate; leaflet blade 2.1–5 × 3.9–9.3 cm, sub-chartaceous to chartaceous, elliptic to rhombic, base oblique, apex acute to retuse, adaxial surface sparse villous, trichomes non-glandular simple and peltate in both surfaces, stipitate in adaxial surface, abaxial surface velutinous trichomes patelliform in abaxial surface, margin entire. Inflorescences in axillary thyrse; pedicels cylindrical, 3–5 mm long, densely covered by simple and glandular-stipitate trichomes; calyx simple, up to 1.2 cm long, campanulate, 5-lobed, apex short apiculate, densely covered by simple and glandular-stipitate trichomes; corolla infundibular, tube 2.2–3 cm long, pink, white at mouth, membranaceous, without nectar guides, 5-lobes, 1.3–2 cm long; 4 stamens included, the smaller pair 1.2–1.4 cm long, the larger pair 1.4–1.6 cm long, anthers 3–4 mm long, non-forward-curved, 1-staminode, 5–7 mm long; ovary cylindrical ca. 2 mm long, sessile, pubescent, simple trichomes, style 1.9–2 cm long, glabrous, stigma ca. 1 mm long, included; disk nectariferous globose, ca. 1 mm diam., glabrous. Capsule linear and flattened, 11.5–19.5 × 1.5–1.2 cm, smooth, non-stipitate, velutinous; seeds not seen.

Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, 07°15.808'S, 37°21.590'W, 818 m, 19.IX.2018, *R. Lopes 259* (EAN).

Tanaecium dichotomum is distributed throughout the Neotropics (Frazão & Lohmann 2019). In Brazil it is found growing in many vegetation types, including all Brazilian states and phytogeographic domains (Frazão & Lohmann 2019). At the Pico do Jabre, it was collected only once, growing in an area with flat and sandy soil.

Tanaecium dichotomum can be easily recognized by the velutinous leaflets, calyx with trichomes simple and glandular-stipitate ranging from light lilac to purple (Fig. 8a-b), and fruit with epicarp velutinous. This species differs from other *Tanaecium* species mainly by the leaflet indument, margin, and fruit shape and fruit indument.

This species was collected with flowers and fruits in September.

11. *Tanaecium parviflorum* (Mart. *ex* DC.) Kaehler & L.G.Lohmann, Taxon 68(4): 765. 2019.

Figs. 2a; 8d-e

Shrubs; branches cylindrical, lenticellate, without interpetiolar gland fields, pilose in the young plant, trichomes simple; prophylls of axillary buds triangular. Leaves 3-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 0.5–1.6 cm long, subcylindrical, pubescent, sparse-lepidote, trichomes simple, and peltate; petiolules 0.2–1.5 cm long, trichomes simple, pubescent; leaflet blade 0.9–2.3 × 1–4.5 cm, membranaceous to sub-chartaceous, elliptic to obovate, base atenuate to oblique, apex acute or retuse, glabrescent on adaxial surface, sparsely lepidote-pubescent on abaxial surface, trichomes non-glandular simple, and glandular peltate in both surfaces, capitate on the adaxial surface, patelliform on the abaxial surface, margin crenate at the upper half. Inflorescences in terminal thyrse; pedicels

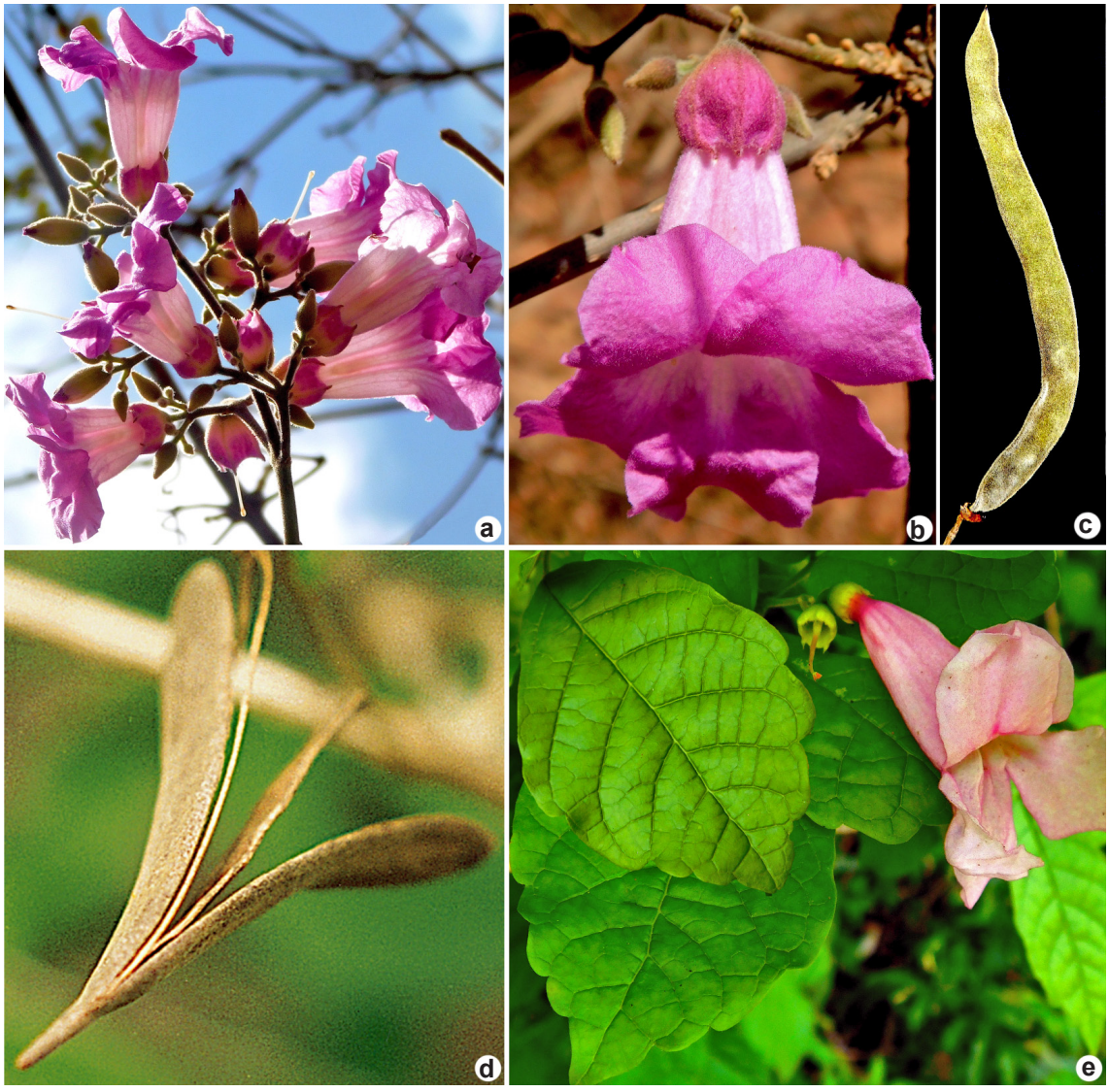

Figure 8 – a-c. *Tanaecium dichotomum* – a. inflorescence in thyrse; b. detail of flower with calyx and corolla; c. fruit immature. d-e. *Tanaecium parviflorum* – d. ripe fruit open with smooth epicarp; e. flowering branch with crenulated leaflets. (a-c. *R. Lopes 259*; d. *M.F. Agra et al. 479*; e. *R. Lopes 240*). Photos: a, b, c, e. R. Lopes; d. M.F. Agra.

cylindrical, 6–9 mm long, pubescent, trichomes simple; calyx simple, 4–6 mm long, tubular, 5-lobed, apex apiculate, pubescent outside, trichomes simple; corolla infundibular, light pink, tube 3–4 cm long, membranaceous, without nectar guides, 5-lobes, 1–2 cm long; 4 stamens included, the smaller pair 1.2–1.3 cm long, the larger pair 1.7–1.8 cm long, anthers ca. 3 mm long, non-forward-curved, 1-staminode, ca. 4 mm long; ovary cylindrical, 2–3 mm long, sessile, pubescent, style 1.7–2.2 cm long, glabrescent, stigma 2–3 mm long, included; disk nectariferous rounded, ca. 1 mm diam., glabrous. Capsule linear-oblong, flattened, 6.7–7.2 × 1.4–1.6 cm, smooth, non-stipitate, glabescent; seeds not seen.
Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, ao sul da sede da Telpa, 07°11'10"S, 37°25'53"W, 18-21.I.1998, *M.F. Agra et al. 4791* (JPB, MO); margem da floresta, 07°15'28.4"S, 37°23'13.1"W, 982 m, 14.III.2018, *R. Lopes 240* (EAN, JPB).

Tanaecium parviflorum is endemic to Brazil, where it occurs in Caatinga vegetation in the states of Bahia, Ceará, Minas Gerais, Paraíba, and Pernambuco, also occurring disjunctly in Mato Grosso do Sul (Frazão & Lohmann 2019). Only one individual of *T. parviflorum* was collected near 982 m on Pico do Jabre, growing on forest edges.

Tanaecium parviflorum is characterized by 3-foliolate leaves, crenate leaflets (Fig. 8e), light-pink corollas (Figs. 2a; 8e), and smooth and glabrescent fruits (Fig. 8d). This species can be easily differentiated from other *Tanaecium* species of Pico do Jabre, especially by the fruit size and leaflet margins (see taxonomic comments in *T. cyrtanthum*).

This species was collected with flowers and fruits in January and March.

Tanaecium parviflorum is used to weave baskets (Silva *et al.* 2007).

12. *Xylophragma harleyi* (A.H.Gentry *ex* M.M.Silva & L.P.Queiroz) L.G.Lohmann, Ann. Missouri Bot. Gard. 99(3): 443. 2014. Fig. 9a-g

Lianas; branches cylindrical, striated, with interpetiolar gland fields, pubescent; prophylls of axillary buds triangular. Leaves 2(–3)foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 1.3–5 cm long, cylindrical, lepidote-pubescent, trichomes simple, and peltate; petiolules ca. 1 cm long, lepidote-pubescent, trichomes simple and peltate; leaflet blade 2.5–9.5 × 1.4–5 cm, chartaceous, oval-elliptic to oblong-elliptic, base oblique, apex acute, lepidote-pubescent on adaxial surface, trichomes non-glandular simple, branched, and peltate; densely lepidote-pubescent on abaxial surface, trichomes non-glandular simple, branched, peltate and patelliform; margin entire. Inflorescences in terminal thyrse; pedicels cylindrical, ca. 2 mm long, densely pubescent, trichomes simple; calyx simple, 1.5–3(–4) mm long, tubular, discreetly 5-lobed, apex denticulate, lepidote-pubescent outside and glabrous inside; corolla tubular, pinkish, tube 4–7 mm long, membranaceous, without nectar guides; 4 stamens included, the smaller pair ca. 2 mm long, larger pair ca. 3 mm long, anthers ca. 1.5 mm long, non-forward-curved, 1-staminode 1.5–1.7 mm long; ovary linear-oblong, ca. 1.5 mm long, sessile, style 2–3 mm long, glabrous, stigma ca. 0.7 mm long, included; disk nectariferous pulvinate, 2.8–3 mm diam., glabrous. Capsule linear, flattened, 0.4–0.9 × 13.5–26.5 cm, smooth, non-stipitate, lepidote; seeds numerous, 0.8–1.1 × 2–3 cm, linear, brown, winged, the wings hyaline.
Examined material: Maturéia, Serra de Teixeira, Pico do Jabre, 07°11'10"S, 37°25'53"W, 800-1,000 m, 16.IV.1993, *M.F. Agra et al. 1984* (JPB); 07°15'08"S, 37°23'01"W, 1,157 m, 30.III.2009, *M.F. Agra et al. 7115* (JPB).
Additional examined material: BRAZIL. BAHIA: Serra do Ramalho, ca. 10 km ao S da cidade, margem do Rio São Francisco, 450 m, 13.IV.2001, *J.G. Jardim 3449* (CEPEC).

Xylophragma harleyi occurs in the dry forest domains of Brazil (Caatinga and Cerrado) from the states of Bahia, Minas Gerais, and Piauí. (Kaehler & Lohmann 2020). This study expands its distribution to the state of Paraíba. It is a rare species at the Pico do Jabre, where it is only known from two collections, one collected in 1993 at 800 m of altitude, and the other collected in 2009 growing at 1,157 m alt.

Xylophragma harleyi is characterized by 2(–3)-foliolate leaves, with lepidote-pubescent indument, with simple and branched trichomes, and calyx tubular. This species can be distinguished from *X. heterocalyx* by the denticulate and tubular calyx (*vs.* irregularly 5-lobed, and campanulate calyx in *X. heterocalyx*), corolla completely pink (*vs.* corolla mouth yellow to white in *X. heterocalyx*), with a tube up to 7 mm long (*vs.* corolla mouth yellow to white in *X. heterocalyx*).

This species was collected with flowers from March to April.

13. ***Xylophragma heterocalyx*** (Bureau & K.Schum.) A.H.Gentry, Ann. Missouri Bot. Gard. 66(4): 778. 1979 [1980]. Fig. 2c

Lianas; stems and branches cylindrical, lenticelate, with interpetiolar gland fields, glabescent, trichomes simple; prophylls of axillary buds bromeliad-like. Leaves 2–3-foliolate; tendrils simple, without an adhesive disk at the apex, non-uncinate; petiole 3.6–7 cm long, pentagonal, sparse-lepidote, trichomes peltate; petiolules 0.2–2.1 cm long, sparse lepidote-glabrescent, trichomes simple, and peltate; leaflet blade 3.1–4.9 × 7.9–14 cm, sub-chartaceous to chartaceous, elliptic-lanceolate to ovate-lanceolate, base oblique, apex acute, lepidote-glabrescent on the adaxial surface, trichomes non-

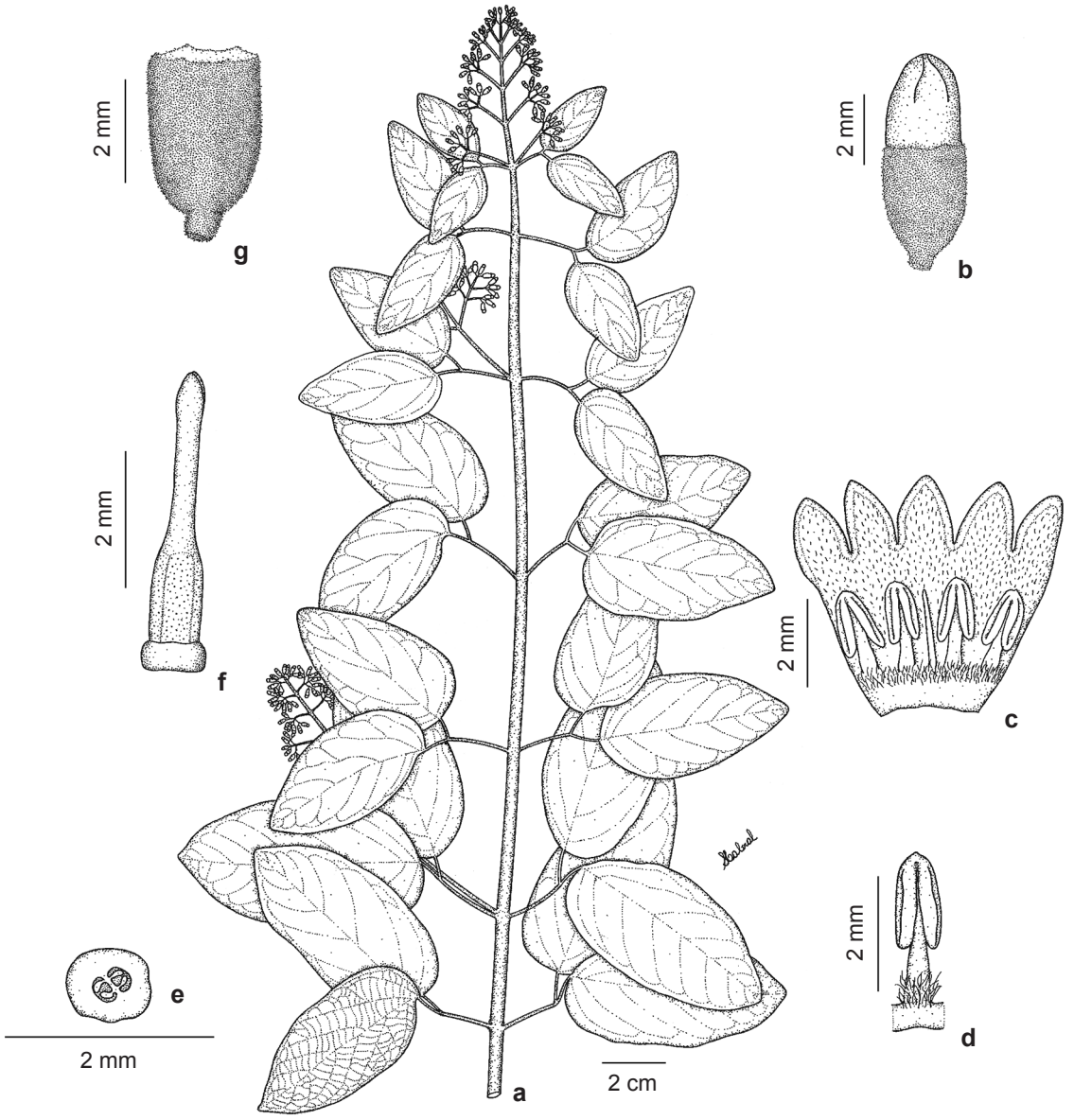

Figure 9 – a-g. *Xylophragma harleyi* – a. flowering branch with 2-foliolate leaves; b. floral bud; c. opened corolla and stamens included; d. young stamen pilose at the filament base; e. ovary 2-locular in transverse section; f. gynoecium glabrous with ovary linear-oblong and nectary disk cupuliform; g. calyx cupular, 5-lobed, and pubescent. (a-g. *M.F. Agra et al. 1984*).

glandular simple and glandular peltate, sparsely lepidote on the abaxial surface, trichomes simple non-glandular, glandular peltate, and patelliform, margin entire. Inflorescences in axillary thyrse; pedicels irregularly cylindrical, 2–8 mm long, densely lanulose, trichomes simple and branched; calyx simple, 0.4–1.3 cm long, campanulate, irregularly 5-lobed, lanulose, trichomes simple and branched; corolla infundibular, lilac inside and outside up to lobes, corolla mouth yellow to white, tube up to 4 cm long, membranaceous, without nectar guides, 5-lobes, 0.9–2 cm long; 4 stamens included, the smaller pair 1.3–1.5 cm long, the larger pair 1.9–2.1 cm long, anthers 3–4 mm long, non-forward-curved, 1-staminode, ca. 3 mm; ovary cylindrical, 2–3 mm long, glabrous, style 2.6–2.7 mm long, glabrous, stigma 2–3 mm long, included; disk nectariferous globose, ca. 1 mm diam., glabrous. Fruits and seeds not seen.
Material examined: Maturéia, Serra de Teixeira, Pico do Jabre, margem da estrada que dá acesso ao Pico do Jabre, 07º15.808'S, 37º21.590W, 818 m, 19.IX.2018, *R. Lopes 260* (EAN, JPB); próximo à trilha da jibóia, 07º15'34.8"S, 37º23'08.4"W, 1,028 m, 26.IX.2018, *R. Lopes 261* (EAN, JPB).
Additional examined material: BRAZIL. BAHIA: município de Itaberaba, Fazenda Morros, 15.IX.1984, *G.G. Hatschbach 48208* (CEPEC, MBM, MO, U, US). MINAS GERAIS: Caranday, *A. Glaziou 14109* (P). PARAÍBA: munícipio de Serra da Raiz, Sítio Boa Ventura, 14.XI.2016, *J.M.P. Cordeiro 1075* (EAN, UPCB); munícipio de Sertãozinho, Sítio Canafístula, 15.XII.2017, *J.M.P. Cordeiro 1256* (EAN, NY).

Xylophragma heterocalyx is endemic to Brazil, where it was known from the type collection from the state of Minas Gerais exclusively (Kaehler & Lohmann 2020). More recently specimens from state of Paraíba (*J.M.P. Cordeiro 1075*, EAN/UPCB; *1256*, EAN/NY) were located, expanding its distribution into the Northeast of Brazil. This is the first record of *X. heterocalyx* for the state of Paraíba and for the Caatinga phytogeographic domain. It was collected in the area growing between 818–1,028 m alt.

Xylophragma heterocalyx can be recognized by the deciduous leaves when flowering, leaves sparse-lepidote, without branched trichomes, dense inflorescence, calyx campanulate, and corolla mouth yellow to white. Bees were observed visiting its flowers. See taxonomic comments of *X. harleyi* for information on how to differentiate these species.

This species was collected with flowers in September.

Acknowledgements

We thank Maria de Fátima de Araújo, for support during fieldwork and fruitful comments on earlier versions of this manuscript. We also thank Joel Cordeiro, for providing a photo of *D. unguis-cati*; Annelise Frazão, for assistance with the identification of *T. dichotomum* and *T. cyrtanthum*; Anauara Lima Silva, for assistance with figure preparation; Leonardo Félix and two anonymous reviewers, for helpful comments on this manuscript. We also thank the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), for a Master's scholarship to R.F.L.S.; and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), for productivity grants to M.F.A. (309868/2017-3) and L.G.L. (310871/2017-4).

References

Agra MF, Barbosa MRV & Stevens WD (2004) Levantamento florístico preliminar do Pico do Jabre, Paraíba, Brasil. *In*: Porto KC, Cabral JJP & Tabarelli M (eds.) Brejos de altitude em Pernambuco e Paraíba: história natural, ecologia e conservação. Ministério do Meio Ambiente, Brasília. Pp. 123-138.

Alcantara S & Lohmann LG (2010) Evolution of floral morphology and pollination system in Bignonieae (Bignoniaceae). American Journal of Botany 97: 782-796. <http://doi.org/10.3732/ajb.0900182>

Amorozo M & Gély A (1988) Uso de plantas por caboclos do baixo Amazonas, Barcarena. Boletim do Museu Paraense Emilio Goeldi, Serie Botanica 4: 47-131.

Borges ABS & Maciel A (2003) Bacia do Atlântico Norte/Nordeste. *In*: II Simpósio Regional de Geografia: "perspectivas para o cerrado no século XXI". Universidade Federal de Uberlandia, Instituto de Geografia, Brasília. Pp 1-9.

Bureau LE & Schumann K (1896) Bignoniaceae. *In*: Martius KFP & Eichler AW (eds.) *Flora brasiliensis*: enumeratio plantarum in Brasilia hactenus detectarum. Fleischer, Leipzig. Vol. 8, part 2, pp 1-452.

Bye RA (1979) An 1878 ethnobotanical collection from San Luis Potosi: Dr. Edward Palmer's first major mexican collection. Economic Botany 33: 135-162.

Candolle AP (1845) Ordo CXXXIII. Bignoniaceae. Prodromus Systematic Naturalis Regni Vegetabilis 9: 142 - 248.

Cartaxo SL, Souza MMA & Albuquerque UP (2010) Medicinal plants with bioprospecting potential used in semi-arid northeastern Brazil. Journal of Ethnopharmacology 131: 326-342. <http://doi.org/10.1016/j.jep.2010.07.003>

Cunha MDC (2010) Comunidades de árvores e o ambiente na Floresta Estacional Semidecidual Montana do Pico do Jabre, PB. PhD Thesis, University of Brasília, Brasília. 283p.

Cunha MDC, Silva Júnior MC & Lima RB (2013) A flora lenhosa na floresta estacional semidecídua montana do Pico do Jabre, PB. Revista Brasileira de Ciências Agrárias 8: 130-136. <http://doi.org/10.5039/agraria.v8i1a2294>

Cunha MDC & Silva Júnior MC (2014) Flora e estrutura de floresta estacional semidecidual montana nos estados da Paraíba e Pernambuco. Nativa 2: 95-102. <http://doi.org/10.14583/2318-7670.v02n02a06>

Duarte DS, Dolabela MF, Salas CE, Raslan DS, Oliveiras AB, Nenninger A, Wiedemann B, Wagner H, Lombardi J & Lopes MT (2000) Chemical characterization and biological activity of *Macfadyena unguis-cati* (Bignoniaceae). The Journal of Pharmacy and Pharmacology 52: 347-352. DOI: 10.1211 / 0022357001773904

DRYFLOR - Latin American Seasonally Dry Tropical Forest Floristic Network (2016) Plant diversity patterns in Neotropical dry forests and their conservation implications. Science 353: 1383-1387.

Ferreira DT, Alvares OS, Houghton PJ & Braz-Filho R (2000) Chemical constituents from roots of *Pyrostegia venusta* and considerations about its medicinal importance. Quimica Nova 23: 42-46. DOI: 10.1590/S0100-40422000000100010

Fischer E, Theisen I & Lohmann LG (2004) Bignoniaceae. *In*: Kubitzki K & Kadereit JW (eds.) The families and genera of vascular plants. VII. Flowering plants. Dicotyledons. Lamiales (except Acanthaceae including Avicenniaceae). Springer, Berlin. Pp. 9-38.

Fonseca LHM, Cabral SM, Agra MF & Lohmann LG (2017) Taxonomic revision of *Dolichandra* (Bignonieae, Bignoniaceae). Phytotaxa 301: 001-070. <https://doi.org/10.11646/phytotaxa.301.1.1>

Forman L & Bridson D (1989) The herbarium handbook. Royal Botanic Gardens, Kew. 218p.

Frazão A & Lohmann LG (2019) An updated synopsis of *Tanaecium* (Bignonieae, Bignoniaceae). PhytoKeys 132: 31-52. <doi.org/10.3897/phytokeys.132.37538>

Gentry AH (1979) Additional generic mergers in Bignoniaceae. Annals of Missouri Botanical Garden 66: 778-787.

Gentry AH (1980) Bignoniaceae, Part I, Tribes Crescentieae and Tourretieae. Flora Neotropica 25: 1-131.

Gentry AH (1992) A synopsis of Bignoniaceae ethnobotany and economic botany. Annals of the Missouri Botanical Garden 79: 53-64.

Harris JG & Harris MW (2001) Plant identification terminology: an illustrated glossary. Spring Lake Publishing, Spring Lake. 206p.

Hilgert NI (2001) Plants used in home medicine in the Zenta River basin, Northwest Argentina. Journal of Ethnopharmacology 76: 11-34.

Houghton PJ & Osibogon IM (1993) Flowering plants used against snakebite. Journal of Ethnopharmacology 39: 1-29.

IBGE - Instituto Brasileiro de Geografia e Estatística (2005) Mapa altimétrico do estado da Paraíba. Available at <https://www.ibge.gov.br/geociencias/informacoes-sobre-posicionamento-geodesico/rede-geodesica/16283-rede-altimetrica.html.> Access on 19 June 2020.

Kaehler M, Michelangeli FA & Lohmann LG (2019) Fine tuning the circumscription of *Fridericia* (Bignonieae, Bignoniaceae). Taxon 68: 751-770. <https://doi.org/10.1002/tax.12121>

Kaehler M & Lohmann LG (2020) Taxonomic revision of *Xylophragma* (Bignonieae, Bignoniaceae). Systematic Botany 45: 620-637.

Kumar A, Asthana M, Roy P, Amdeka S & Singh V (2013) Phytochemistry and phamacology of *Pyrostegia venusta*: a plant of family Bignoniaceae. International Journal of Phytomedicine 5: 257-261.

Kunth KS (1818) Bignoniaceae. Nova Genera et Species Plantarum 3: 132-154.

LAWG - Leaf Architecture Working Group (1999) Manual of leaf architecture: morphological description and categorization of dicotyledonous and net-veined monocotyledonous angiosperms. Smithsonian Institution, Washington. 65p.

Lima PJ & Heckendorff WD (1985) Climatologia. *In*: Secretaria de Educação, Universidade Federal da Paraíba (eds.) Atlas Geográfico do Estado da Paraíba. Grafset, Editora Universitária, João Pessoa. 99p.

Lohmann LG (2006) Untangling the phylogeny of Neotropical lianas (Bignonieae, Bignoniaceae). American Journal of Botany 93: 304-315. <https://doi.org/10.3732/ajb.93.2.304>

Lohmann LG (2008) Bignoniaceae. *In*: Hokche O, Berry P & Huber O (eds.) Nuevo catálogo de la flora vascular de Venezuela. Fundación Instituto Botánico de Venezuela, Caracas. Pp. 270-278.

Lohmann LG (2010) Bignoniaceae. *In*: Forzza RC, Baumgartz JFA, Bicudo CEM, Carvalho Jr AA, Costa A, Costa DP, Hopkins M, Leitman PM, Lohmann LG, Maia LC, Martinelli G, Menezes M, Morim MP, Nadruz-Coelho MA, Peixoto AL, Pirani JR, Prado J, Queiroz LP, Souza VC, Stehmann JR, Sylvestre LS, Walter BMT & Zappi D (eds.) Catálogo de plantas e fungos do Brasil. Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rio de Janeiro. Pp. 258-272.

Lohmann LG, Fonseca LHM, Kaehler M, Farias-Singer R, Firetti F, Castro MM, Gomes BM, Frazão A, Francisco JNC, Thode VA, Zuntini AR, Medeiros MCMP, Kataoka EY & Beyer M (2021) Bignoniaceae. *In*: Flora do Brasil 2020 (continuously updated). Jardim Botânico do Rio

de Janeiro. Available at <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB112305>. Accessed on January 2021.

Lohmann LG, Bell C, Calió MF & Winkworth RC (2013) Pattern and timing of biogeographic history in the neotropical tribe Bignonieae (Bignoniaceae). Botanical Journal of the Linnean Society 171: 154-170. <https://doi.org/10.1111/j.1095-8339.2012.01311.x>

Lohmann LG & Taylor CM (2014) A new generic classification of tribe Bignonieae (Bignoniaceae). Annals of Missouri Botanical Garden 99: 348-489. <https://doi.org/10.3417/2003187>

Lohmann LG & Pirani JR (1998) Flora da Serra do Cipó, Minas Gerais: Bignoniaceae. Boletim de Botânica da Universidade de São Paulo 17: 127-153.

Lohmann LG & Ulloa Ulloa C (2021) Bignoniaceae. *In*: Checklist of the world. MOBOT/NYBG/Kew Gardens. iPlants Prototype Checklist. Available at <http://www.iplants.org/>. Accessed on 22 January 2021.

Maury CM (2002) Biodiversidade brasileira: avaliação e identificação de áreas e ações prioritárias para conservação, utilização sustentável e repartição de beneficios da biodiversidade nos biomas brasileiros. Ministério do Meio Ambiente, Brasília. 404p.

Miers J (1863) Report on the plants collected by Mr. Weir, especially the Bignoniaceae. Proceedings of the Royal Horticultural Society London 3: 179-202.

MMA - Ministério do Meio Ambiente (2000) Avaliação e acões prioritárias para a conservação da Biodiversidade da Floresta Atlântica e Campos Sulinos. MMA/SBF, Brasília. 46p.

Nogueira A, El Otrra JHL, Guimarães E, Machado SR & Lohmann LG (2013) Trichome structure and evolution in Neotropical lianas. Annals of Botany 112: 1331-1350. <http://doi.org/10.1093/aob/mct201>

Olmstead RG, Zjhra ML, Lohmann LG, Grose SO & Eckert AJ (2009) A molecular phylogeny of Bignoniaceae. American Journal of Botany 96: 1731-1743. <http://doi.org/10.3732/ajb0900004>

Pace MR, Lohmann LG & Angyalossy V (2009) The rise and evolution of the cambial variant in Bignonieae (Bignoniaceae). Evolution & Development 11: 465-479.

Pace MR, Lohmann LG, Olmstead RG & Angyalossy V (2015) Wood anatomy of major Bignoniaceae clades. Plant Systematic and Evolution 301: 967-995.

Pontes RAS & Agra MF (2001) Flora do Pico do Jabre, Paraíba, Brasil: Acanthaceae. Leandra 16: 51-60.

Pool A (2007) A revision of the genus *Pithecoctenium* (Bignoniaceae). Annals of the Missouri Botanical Garden 94: 622-643. <https://doi.org/10.3417/0026-6493(2007)94[622:AROTGP]2.0.CO;2>

Pool A (2008) A review of the genus *Pyrostegia* (Bignoniaceae). Annals of the Missouri Botanical Garden 95: 495-511. <https://doi.org/10.3417/2003090>

Radford AE, Dickison WC, Massey & Jr Bell R (1974) Vascular plant systematics. Harper & Row publishers, New York. 83p.

Rocha EA & Agra MF (2002) Flora do Pico do Jabre, Paraíba, Brasil: Cactaceae Juss. Acta Botanica Brasilica 16: 1-8. <http://dx.doi.org/10.1590/S0102-33062002000100004>

Silva LR, Silva-Castro MM & Conceição AS (2018) Bignoniaceae in the Raso da Catarina Ecoregion, Bahia, Brazil. Biota Neotropica 18: 1-22. <http://dx.doi.org/10.1590/1676-0611-BN-2017-0466>

Silva TMS, Silva TG, Martins RM, Maia GLA, Cabral AGS, Camara CA, Agra MF & Barbosa-Filho JM (2007) Molluscicidal activities of six species of Bignoniaceae from north-eastern Brazil, as measured against *Biomphalaria glabrata* under laboratory conditions. Annals Tropical Medicine Parasitology 101: 359-365. <http://doi.org/10.1179/136485907X176427>

Sousa-Baena MS, Sinha NR & Lohmann LG (2014a) Evolution and development of tendrils in Bignonieae (Lamiales, Bignoniaceae). Annals of Missouri Botanical Garden 99: 323-347. <https://doi.org/10.3417/2011018>

Sousa-Baena MS, Lohmann LG, Rossi M & Sinha NR (2014b) Acquisition and diversification of tendrilled leaves in Bignonieae (Bignoniaceae) involved changes in expression patterns of SHOOTMERISTEMLESS (STM), LEAFY/FLORICAULA (LFY/FLO), and PHANTASTICA (PHAN). New Phytologist 201: 993-1008. <http://doi.org/10.1111/nph.12582>

Stasi LC & Hiruma-Lima CA (2002) Plantas medicinais na Amazônia e na Mata Atlântica. Editora Unesp, São Paulo. 592p.

Stearn WT (1992) Latim botânico. David & Charles Book, London. 546p.

SUDEMA - Superintendência de Administração do Meio Ambiente (1994) Pico do Jabre. Superintendência de Desenvolvimento do Meio Ambiente, João Pessoa. 61p.

Tabarelli M & Santos AMM (2004) Uma breve história natural dos Brejos Nordestinos. *In*: Porto KC, Cabral JP & Tabarelli M (eds.) Brejos de altitude de Pernambuco e Paraíba: história natural, ecologia e conservação. Ministério do meio Ambiente, Brasília. Pp. 17-24.

Thiers B (continuously updated) Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available at <http://sweetgum.nybg.org/science/ih/>. Accessed in March 2020.

Veloso CC, Bitencourt AD, Cabral LD, Franqui LS, Dias DF, Santos MH, Soncini R & Giusti-Paiva A (2010) *Pyrostegia venusta* attenuate the sickness behavior induced by lipopolysaccharide in mice. Journal of Ethnopharmacology 132: 355-358.

Velloso AL, Sampaio EVSB & Pareyn FGC (2002) Ecorregiões propostas para o bioma caatinga. Associação Plantas do Nordeste, The Nature Conservancy do Brasil, Recife. 81p.

Zuntini AR (2014) Revisão e filogenia de *Bignonia* L. (Bignonieae, Bignoniaceae). PhD Thesis. University of São Paulo, São Paulo. 309p.

Area Editor: Dr. Leandro Giacomin
Received in October 20, 2020. Accepted in June 16, 2021.