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Original Paper

Flora of Pernambuco, Brazil: Bignonieae (Bignoniaceae)

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Abstract

This study shows a taxonomic treatment for all species of Bignonieae from the state of Pernambuco (Brazil). Through extensive herbarium and field work, we documented 42 species and 13 genera for Pernambuco, of which six species represent new records for the state (*i.e.*, *Adenocalymma coriaceum*, *Anemopaegma gracile*, *Anemopaegma velutinum*, *Bignonia sciuripabulum*, *Callichlamys latifolia* and *Fridericia cuneifolia*). In addition, *Anemopaegma citrinum* was documented for the first time in the Atlantic Forest domain. We provide identification keys for genera and species, taxonomic descriptions, data on geographic distribution, habitat, phenology, and illustrations for all species.

Key words: botanical inventories, Brazilian Northeast, lianas.

Resumo

Este estudo apresenta um tratamento taxonômico para todas as espécies de Bignonieae do estado de Pernambuco (Brasil). A partir de estudos extensivos no herbário e campo, documentamos 42 espécies e 13 gêneros para Pernambuco, das quais seis espécies são novos registros para o estado (*i.e.*, *Adenocalymma coriaceum*, *Anemopaegma gracile*, *Anemopaegma velutinum*, *Bignonia sciuripabulum*, *Callichlamys latifolia* e *Fridericia cuneifolia*). Além disso, *Anemopaegma citrinum* foi documentada pela primeira vez no domínio Mata Atlântica. Apresentamos chaves de identificação para gêneros e espécies, descrições taxonômicas, dados de distribuição geográfica, habitat, fenologia, e ilustrações para todas as espécies.

Palavras-chave: inventários botânicos, nordeste brasileiro, lianas.

Introduction

Bignoniaceae comprises about 830 species and 82 genera (Lohmann & Ulloa Ulloa 2006 continuously updated), representing an important component of the Tropical flora, where 80% of the species occur. The family is centered in Brazil, where 33 genera and 413 species are found, of which two genera and 199 species are endemic (Lohmann 2010). Bignoniaceae includes lianas, trees, and shrubs that occur predominantly in humid forests, although some species also occur in dry forests, sub-desertic conditions, lowland forests, highlands, or rocky outcrops (Lohmann 2004). Its members can be easily recognized by reproductive and vegetative characters, such as the woody habitat, opposite and compound leaves, large and showy flowers that are hermaphrodite and gamopetalous, bearing four didynamous stamens and one staminode (reduced or elongated) (Lohmann 2004). The fruits are generally dehiscent, frequently with a hyaline wing that surrounds the embryo (Lohmann 2004).

Members of Bignoniaceae are divided into eight main clades that correspond to six tribes (*i.e.*, Bignonieae, Catalpeae, Jacarandeae, Oroxyleae, Tecomeae, and Tourrettieae) and two informally named clades (*i.e.*, *Tabebuia* alliance, Paleotropical clade) (Olmstead *et al.* 2009). The tribe Bignonieae is the most speciose and includes 21 genera and 393 species, corresponding to almost 50% of the species recognized in the family (Lohmann & Taylor 2014). This clade constitutes the most diverse and abundant group of lianas in Neotropical forests, representing

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an appropriate model to study the high diversity of tropical plant communities (Gentry 1986, 1990). The tribe is centered in Brazil (Meyer *et al.* 2019), where all twenty genera (Lohmann & Taylor 2014; Fonseca & Lohmann 2019), and 301 species (129 endemic) are found (Lohmann 2010).

The tribe includes woody lianas and shrubs, with an irregular cambial growth that leads to the formation of 4–32 phloem wedges, terminal leaflets modified in tendrils, and septicidal capsules (Lohmann 2006; Lohmann & Taylor 2014). The most comprehensive phylogeny for the whole tribe to date (Lohmann 2006) led to a new generic classification for the tribe where only monophyletic groups characterized by morphological synapomorphies are recognized as genera (Lohmann & Taylor 2014).

Bignoniaceae is the eighth most diverse family in the Caatinga (Giulietti *et al*. 2006). Despite that, few studies of this plant family are available for Northeastern Brazil (but see Harley & Simmons 1986; Gentry 1995; Lohmann & Pirani 1996a; Silva-Castro & Queiroz 2003; Espírito-Santo *et al.* 2013; Silva *et al.* 2016; Colombo *et al.* 2016; Santos *et al*. 2009, 2013; Medeiros *et al.* 2018). While a recent study treated all members of the Tabebuia alliance and tribe Jacarandeae for Pernambuco (Costa *et al.* 2019), a detailed floristic account of tribe Bignonieae from Pernambuco is still lacking. This study presents a complete taxonomic treatment for all species of Bignonieae from Pernambuco. Our results will help reduce the taxonomic impediment (Coleman 2015), as well as will contribute important knowledge for the management and conservation of the Brazilian flora. This study also provides useful information for future studies on the ecology, evolution, and biogeography of this iconic group of plants.

Material and Methods

Pernambuco is located in Northeast Brazil (Fig. 1), between 7º15'45" and 9º28'18"S, 34º48'35" and 41º19'54"W, including 98.311 km² of surface area (Andrade-Lima 1960). About 80%

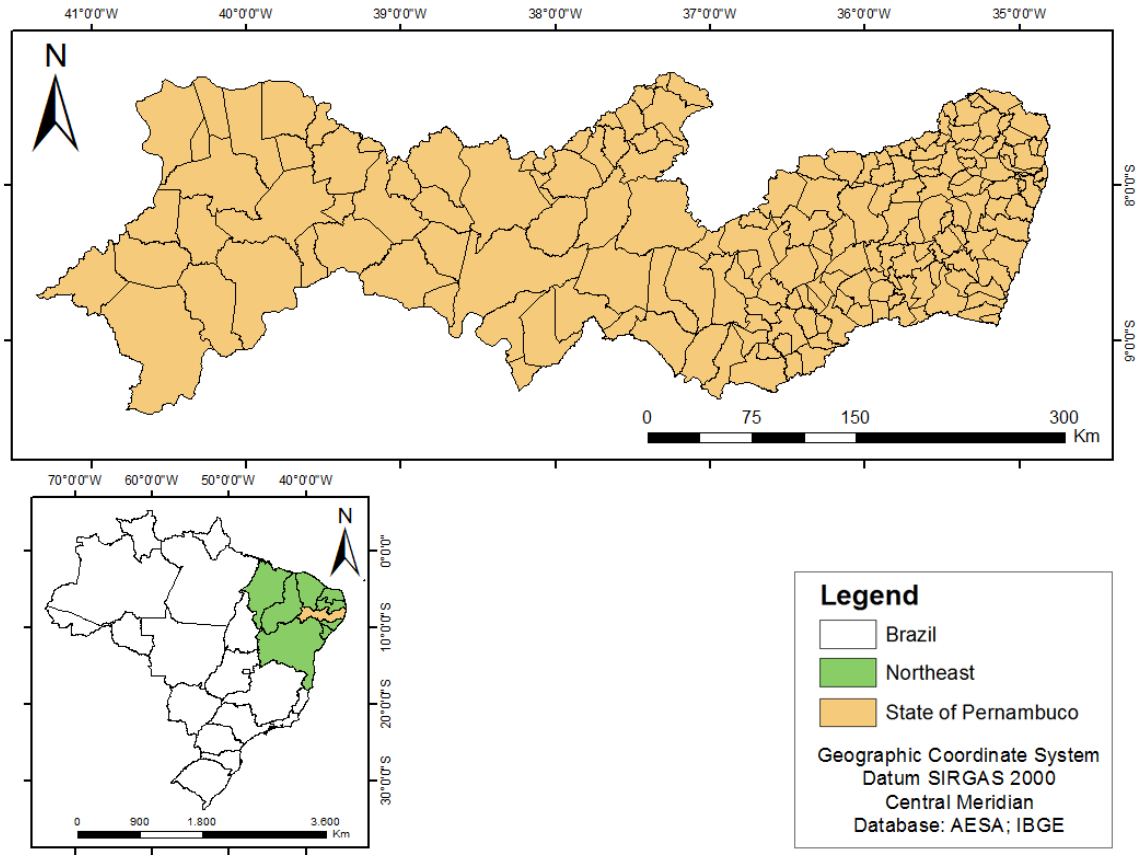

Figure 1 – Map indicating the location of the state of Pernambuco (in orange), within the Northeastern region of Brazil (in green). Prepared by Thais Mara Souza.

of its territory is included on Caatinga domain, but fragments of ombrophilous and seasonal forests, forested highlands, "brejos de altitude," "restingas," mangroves, dunes, and associated ecosystems are found along the coast and "Zona da Mata" region (Andrade-Lima 1960).

This is the second part of a complete taxonomic treatment for the Bignoniaceae from the state of Pernambuco. The first paper included the Tabebuia alliance and tribe Jacarandeae (Costa *et al.* 2019). Field expeditions and herbarium work were carried out between 2017 and 2018. In total, 2,795 specimens deposited in the following herbaria were studied: HACAM (Herbário Manuel de Arruda Câmara, not indexed), EAC, HESBRA (Herbário do Semiárido do Brazil, not indexed), HST (Herbário Sérgio Tavares, not indexed), HUEFS, HUFRN, HVASF, IPA, JPB, MOSS, PEUFR, RB, and UFP (acronyms follow Thiers, continuously updated). Field expeditions were conducted during flowering or fruiting periods and focused on poorly sampled areas as well as locations where a large number of species was expected. Plant material was collected and pressed following Bridson & Forman (1998). Specimens were deposited at PEUFR, the Herbarium of the Federal University of Pernambuco.

Species identifications were based on comparisons with specimens previously identified by specialists, photos of type material, information provided on the protologues, and specialized literature (*e.g.*, Bureau & Schumann 1896; Colombo *et al.* 2016; Gentry 1992, 2009; Lohmann 2004, 2010; Lohmann & Taylor 2014; Lohmann & Pirani 1996a, 1996b, 2003; Pereira & Mansano 2008; Pool 2007a, 2007b, 2009; Silva-Castro *et al.* 2007; Scudeller 2004). We also consulted virtual collections of REFLORA (Brazil), Missouri Botanical Garden (MOBOT), and The New York Botanical Garden (NY) to support identifications and complement information on species distribution and morphology.

Morphological terminology followed Harris & Harris (2000), Gonçalves & Lorenzi (2007), and Lohmann & Taylor (2014). Descriptions were based only on examined material and focus on diagnostic reproductive and vegetative characters. Due to the large amount of examined materials, we list as "selected material" one high quality fertile specimen from each phytogeographic domain (*i.e.*, Caatinga and/or Atlantic Forest). A complete list of specimens is provided as Supplementary Material (Appendix S1, available at <https://doi.org/10.6084/m9.figshare.16862023.v1). Geographic distribution, phenology, ecological data, altitude, and common names were obtained from specimen labels when available.

The study area location map (Fig. 1) and the species richness distribution map (Fig. 2) were both prepared using DIVA-GIS (Hijmans *et al.* 2012). Geographic coordinates were obtained from specimen labels or from the speciesLink database (<http://www.splink.org.br/>).

Results and Discussion

We documented 42 species and 13 genera for the state of Pernambuco, of which six species represent new records (Figs. 3-7). The genus *Fridericia* Mart. was the most diverse (8 spp.), followed by *Adenocalymma* Mart. *ex* Meisner (4 spp.), *Anemopaegma* Mart. *ex* Meisner (5 spp.), *Tanaecium* Sw. (5 spp.), *Cuspidaria* DC. (4 spp.), *Mansoa* DC. (4 spp.), *Amphilophium* Kunth (3 spp.), *Bignonia* L. (3 spp.), *Dolichandra* Cham. (2 spp.), *Callichlamys* Miq. (1 sp.), *Lundia* DC. (1 sp.), *Pleonotoma* Miers (1 sp.), and *Pyrostegia* Presl (1 sp.) (Tab. 1). The most common species in the area were: *Anemopaegma laeve* DC., *Fridericia dispar* (Bureau & K. Schum.) L.G.Lohmann, *Lundia longa* (Vell.) DC., and *Pyrostegia venusta* (Ker Gawl.) Miers.

Forty-two species of Bignonieae were documented for the state of Pernambuco in the checklist of the Bignoniaceae from Brazil (Lohmann 2010). However, recent synopses (Fonseca & Lohmann 2019; Frazão & Lohmann 2019), phylogenetic studies (Kaehler *et al.* 2019; Thode *et al.* 2019), and monographs (Zuntini *et al.* submitted) led to revised circumscriptions of some taxa and the following species are no longer thought to occur in Pernambuco: *Adenocalymma validum* (K. Schum.) L.G.Lohmann, *Amphilophium frutescens* (DC.) L.G.Lohmann, *Bignonia campanulata* Cham., *Fridericia caudigera* (S. Moore) L.G.Lohmann, *Fridericia platyphylla* (Cham.) L.G.Lohmann, and *Tanaecium neobrasiliense* L.G.Lohmann. As a result, the overall number of Bignonieae species recorded for the state of Pernambuco was reduced to 34 species (Lohmann 2010).

On the other hand, *Adenocalymma coriaceum* DC., *Anemopaegma citrinum* Mart. *ex* DC., *Anemopaegma gracile* Bureau & K.Schum., *Anemopaegma velutinum* Mart. *ex* DC., *Bignonia sciuripabulum* (K. Schum.) L.G.Lohmann, *Callichlamys latifolia* (Rich.) Schum., and *Fridericia cuneifolia* (DC.) L.G.Lohmann were documented in this study for the first time for the state of Pernambuco, leading again to 42 species of Bignonieae recorded for Pernambuco (Tab. 1).

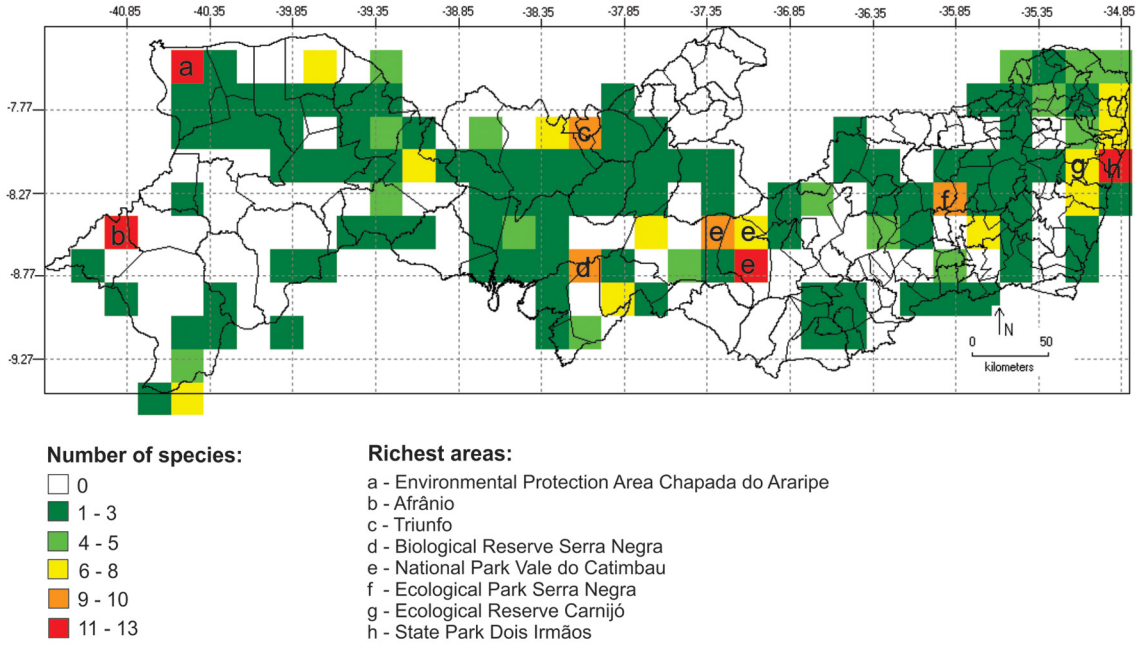

Figure 2 – Map showing the species richness of members of tribe Bignonieae in the state of Pernambuco. Prepared by Silmara Nepomuceno.

Table 1 – Species of tribe Bignonieae (Bignoniaceae) found in state of Pernambuco. (NR = New Record; CA = Caatinga; AF = Atlantic Forest)**.**

Species	NR	Endemism in Brazil	Phytogeographical domains	
			CA	AF
Adenocalymma candolleanum (Mart. *ex* DC.) L.H. Fonseca & L.G. Lohmann		Endemic to Brazil	X	
Adenocalymma comosum (Cham.) DC.		Endemic to Brazil		X
Adenocalymma coriaceum A. DC.	X	Endemic to Brazil		X
Adenocalymma cristicalyx (A.H. Gentry) L.G. Lohmann		Endemic to Brazil	X	
Amphilophium crucigerum (L.) L.G. Lohmann		Not endemic	X	X
Amphilophium paniculatum (L.) Kunth		Not endemic	X	X
Amphilophium scabriusculum (Mart. *ex* DC.) L.G. Lohmann		Endemic to Brazil		X
Anemopaegma album Mart. *ex* DC.		Endemic to Brazil	X	X
Anemopaegma citrinum Mart. *ex* DC.		Not endemic	X	X
Anemopaegma gracile Bureau & K. Schum	X	Endemic to Brazil	X	X
Anemopaegma laeve DC.		Endemic to Brazil	X	
Anemopaegma velutinum Mart. *ex* DC.	X	Endemic to Brazil	X	
Bignonia corymbosa (Vent.) L.G. Lohmann		Not endemic		X
Bignonia ramentacea (Mart. *ex* DC.) L.G. Lohmann		Endemic to Brazil	X	
Bignonia sciuripabulum (K. Schum.) L.G. Lohmann	X	Not endemic	X	X

Species	NR	Endemism in Brazil	Phytogeographical domains	
			CA	AF
Callichlamys latifolia (Rich.) K.Schum.	X	Not endemic	X	X
Cuspidaria argentea (Wawra) Sandwith		Endemic to NE Brazil	X	
Cuspidaria lateriflora (Mart.) DC.		Not endemic	X	X
Cuspidaria octoptera A.H. Gentry		Endemic to Brazil	X	
Cuspidaria simplicifolia DC.		Endemic to Brazil	X	
Dolichandra quadrivalvis (Jacq.) L.G. Lohmann		Not endemic	X	X
Dolichandra unguis-cati (L.) L.G. Lohmann		Not endemic	X	X
Fridericia chica (Bonpl.) L.G. Lohmann		Not endemic	X	X
Fridericia conjugata (Vell.) L.G. Lohmann		Not endemic	X	X
Fridericia cuneifolia (DC.) L.G. Lohmann	X	Endemic to Brazil	X	X
Fridericia dispar (Bureau & K. Schum.) L.G. Lohmann		Endemic to NE Brazil	X	X
Fridericia erubescens (DC.) L.G. Lohmann		Endemic to Brazil	X	
Fridericia limae (A.H. Gentry) L.G. Lohmann		Endemic to NE Brazil	X	
Fridericia pubescens (L.) L.G. Lohmann		Not endemic	X	
Fridericia triplinervia (Mart. *ex* DC.) L.G. Lohmann		Not endemic	X	X
Lundia longa (Vell.) DC.		Endemic to Brazil		X
Mansoa difficilis (Cham.) Bureau & K. Schum.		Not endemic	X	X
Mansoa hirsuta DC.		Endemic to NE Brazil	X	
Mansoa ohohualcoides A.H. Gentry		Endemic to Brazil		X
Mansoa paganuccii M.M. Silva-Castro		Endemic to Brazil	X	
Pleonotoma stichadenia K. Schum.		Endemic to Brazil	X	X
Pyrostegia venusta (Ker Gawl.) Miers		Not endemic	X	X
Tanaecium cyrtanthum (Mart. *ex* DC.) Bureau & K. Schum.		Not endemic	X	X
Tanaecium dichotomum (Jacq.) Kaehler & L.G. Lohmann		Not endemic	X	
Tanaecium parviflorum (Mart. *ex* DC.) Kaehler & L.G. Lohmann		Endemic to Brazil	X	
Tanaecium pyramidatum (Rich.) L.G. Lohmann		Not endemic	X	
Tanaecium selloi (Spreng.) L.G. Lohmann		Not endemic		X
Total: 42 species	**6**		**35**	**26**

The richness map of Bignonieae for the state of Pernambuco (Fig. 2) indicates that the National Park Vale do Catimbau (Fig. 2e), the State Park Dois Irmãos (Fig. 2h), the Environmental Protection Area Chapada do Araripe (Fig. 2a), the Biological Reserve Serra Negra (Fig. 2d), the Ecological Reserve Carnijó (Fig. 2g), and the Ecological Park Serra Negra (Fig. 2f) are the richest areas of the state. These areas are located within conservation units, highlighting the importance of protecting these areas for the conservation of the Flora of Pernambuco. The map also highlights other priority areas for conservation within the state, all of which include high species richness but are outside conservation units, such as Afrânio (Fig. 2b) and Triunfo (Fig. 2c).

Taxonomic treatment

Key for the identification of Bignonieae genera from Pernambuco

1. Leaves 2-ternate ..... 11. *Pleonotoma*
1'. Leaves 1–3-foliolate or 2–3-ternate 2
2. Branchlets hexagonal 3
3. Inflorescence a raceme, axillary; calyx and corolla coriaceous; stamens included ..... 2. *Amphilophium*
3'. Inflorescence a cyme corymbiform, terminal; calyx and corolla membranaceous; stamens exserted ..... 12. *Pyrostegia*
2'. Branchlets cylindrical 4
4. Nectar disk reduced or absent 5
5. Calyx cupular or spathaceous; corolla infundibuliform; anthers, stigma, and ovary glabrous ..... 4. *Bignonia*
5'. Calyx and corolla tubular; anthers, stigma, and ovary villose ..... 9. *Lundia*
4'. Nectar disk well developed, annular 6
6. Corolla yellow 7
7. Calyx spathaceous, rarely wide-cupular 8
8. Tendril trifid, uncinated ..... 7. *Dolichandra*
8'. Tendril simple, not-uncinated ..... 5. *Callichlamys*
7'. Calyx cupular (except spathaceous in *Adenocalymma candolleanum*) 9
9. Calyx with cupular glands; fruit and ovary not stipitate ..... 1. *Adenocalymma*
9'. Calyx without cupular glands; fruit and ovary stipitate ..... 3. *Anemopaegma*
6'. Corolla pink, lilac, purple or orange 10
10. Stems with garlic smell; tendril trifid ..... 10. *Mansoa*
10'. Stems inodorous; tendril simple or bifid 11
11. Anthers with thecae forward-curved ..... 6. *Cuspidaria*
11'. Anthers with thecae straight 12
12. Prophylls of the axillary buds triangular, not foliaceous; inflorescence a compound thyrse or a dicasial cyme ..... 8. *Fridericia*
12'. Prophylls of the axillary buds bromeliad-like, foliaceous; inflorescence a simple thyrse ..... 13. *Tanaecium*

1. *Adenocalymma* Martius *ex* Meisner Pl. Vasc. Gen. 1: 300, 2: 208. 1840, emend. L.G. Lohmann. in Lohmann & Taylor, Ann. Missouri Bot. Gard. 99: 382. 2014.

Lianas; branchlets cylindrical, inodorous. Leaves 2–3-foliolate or 2–3-ternate, with the terminal leaflet or terna often modified into a simple, trifid or multifid tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a raceme, rarely a thyrse, axillary or terminal. Calyx cupular or spathaceous, coriaceous or membranaceous, with cupular glands, not spongy; corolla infundibuliform, yellow, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth, lepidote; disk annular. Capsule linear, not stipitate, flattened or inflated, woody, 2-parted, without lenticels, calyx caducous; seeds winged, wings hyaline.

Adenocalymma includes 76 species distributed through dry forests, Caatinga, and savannahs from México to Paraguay and Brazil (Fonseca & Lohmann 2019). In Brazil, 68 species occur, 42 of which are endemic (Lohmann 2010). Four species are found in Pernambuco, *A. candolleanum*, *A. cristicalyx*, *A. comosum*, and *A. coriaceum.*

Key for the identification of species of *Adenocalymma* from Pernambuco

1. Leaves 2–3-ternate; trifid to multifid tendrils ..... 1.1. *Adenocalymma candolleanum*
1'. Leaves 2–3-foliolate; simple tendrils 2
    2. Inflorescence terminal; corolla yellow, with pinkish lobes ..... 1.4. *Adenocalymma cristicalyx*
    2'. Inflorescence axillary; corolla yellow throughout 3
        3. Branchlets glabrous; leaflets glabrous, with base rounded, apex attenuate ..... 1.2. *Adenocalymma comosum*
        3'. Branchlets sparsely pubescent with glandular and simple trichomes; leaflets pubescent, with base obtuse to attenuate, apex attenuate to acuminate ..... 1.3. *Adenocalymma coriaceum*

1.1. *Adenocalymma candolleanum* (Mart. *ex* DC.) L.H.Fonseca & L.G.Lohmann, Syst. Bot. 44: 902. 2019. Fig. 6h

Liana; branchlets cylindrical, striated, without lenticels, glabrous; prophylls of the axillary buds subulate, not foliaceous, 0.3–1.0 cm long, glabrous. Leaves 2–3-ternate, with the terminal terna often modified into a trifid to multifid tendril; petiole 1.8–3.1 cm long, glabrous; petiolules 1.5–2.0 cm long, glabrous; leaflets chartaceous, 1.9–3.7 × 1.0–1.5 cm, elliptic to ovate, base attenuate, apex cuneate and mucronate, margin entire to sinuate, not revolute, concolor, glabrous, venation brochidodromous. Inflorescence a thyrse, axillary or terminal; bracts and bracteoles 0.2–0.3 cm long, lanceolate. Calyx spathaceous, membranaceous, 2.5–3.9 × 0.8–1.3 cm, 1-apiculated and twisted, green, glabrous; corolla infundibuliform, membranaceous, 4.4–7.4 × 1.1–1.9 cm, yellow, glabrous; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 3.5–6.7 cm long, ventral filaments 3.3–6.4 cm long, staminode ca. 0.4 cm long; ovary elliptic, not stipitate, ca. 0.4 × 0.1 cm, smooth, glabrous, style 3.8–7.0 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, ca. 16.2 × 2.7 cm, coriaceous, flattened, 2-parted, base obtuse, apex acute, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Ouricuri, 6.V.1971, fl., *E.P. Heringer* (PEUFR 7296). Araripina, 13.XII.1997, fl., *A.M. Miranda et al. 2942* (HST).

Additional Examined Material: BRAZIL. BAHIA: rodovia para Ibotirama, 16.III.1995, fr., *G. Hatschbach et al. 61981* (RB).

Adenocalymma candolleanum is endemic to Brazil, where it occurs in Caatinga and Cerrado from Piauí to Minas Gerais (Lohmann 2010; Fonseca & Lohmann 2019). *A. candolleanum* can be recognized vegetatively by the 3-ternate leaves and trifid tendril and reproductively by the spathaceous calyx, with apex 1-apiculated and twisted (Fig. 6h). Collected with flowers from December to May.

1.2. *Adenocalymma comosum* (Cham.) DC., Prodr., 9: 201, 1845. Fig. 3a-b

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds subulate, not foliaceous, 0.2–0.3 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril; petiole 2.7–4.1 cm long, glabrous; petiolules 1.1–2.3 cm long, glabrous; leaflets coriaceous, 5.7–8.9 × 2.7–4.0 cm, elliptic, base rounded, apex attenuate, margin entire, not revolute, discolor, adaxial surface glabrous, abaxial surface lepidote, pubescent on the vein axils, with simple trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles 0.1–0.2 cm long, ovate. Calyx cupular, coriaceous, 0.5–0.7 × 0.6–0.8 cm, truncate to minutely 5-apiculated, yellow, villose, with simple trichomes; corolla infundibuliform, membranaceous, 1.5–2.9 × 0.5–0.9 cm, yellow, externally villose, with simple and glandular trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.3–2.0 cm long, ventral filaments 1.1–1.7 cm long, staminode ca. 0.3 cm long; ovary elliptic, not stipitate, ca. 0.3 × 0.1 cm, smooth, glabrous, style ca. 1.3 cm long, stigma ca. 0.2 cm long, rhombic. Fruits and seeds not seen.

Selected Material: Vicência, 20.X.1969, fl., *D. Belo* (PEUFR 31499). Goiana, RPPN Fazenda Tabatinga, 22.VIII.2010, fl., *D. Cavalcante et al. 226* (UFP).

Adenocalymma comosum is endemic to Brazil, where it occurs in Atlantic forest from Pernambuco to Santa Catarina (Lohmann 2010). *Adenocalymma comosum* and *A. coriaceum* share yellow corollas, cylindrical branchlets, elliptic and coriaceous leaflets, and axillary inflorescences. *Adenocalymma comosum* can be

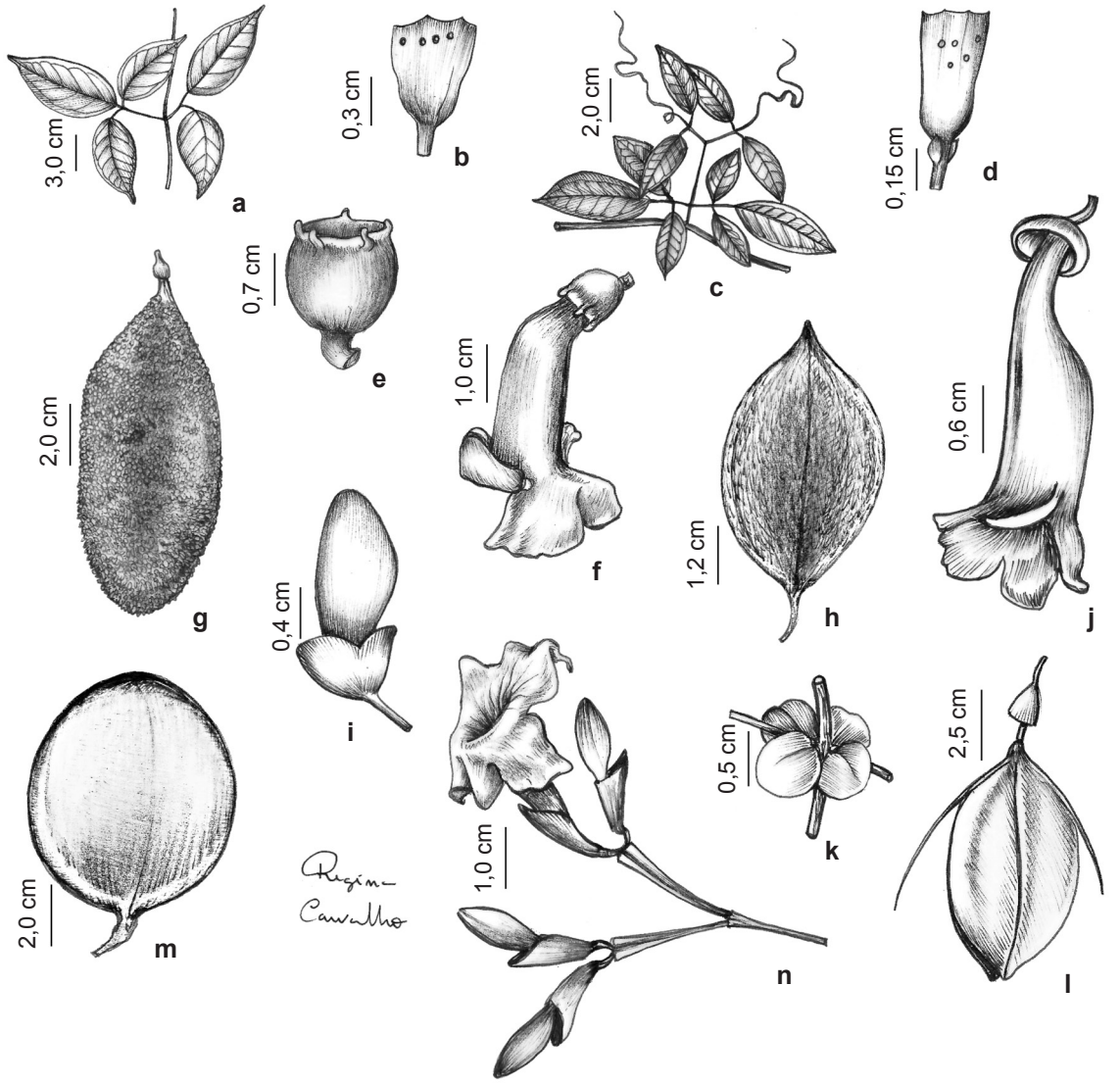

Figure 3 – a-d. *Adenocalymma comosum* – a. leaves; b. calyx. c-d. *Adenocalymma coriaceum* – c. leaves; d. calyx. e-g. *Amphilophium crucigerum* – e. calyx; f. flower; g. fruit. h. *Amphilophium scabriusculum* – fruit. i. *Anemopaegma album* – flower bud. j. *Anemopaegma gracile* – flower. k-l. *Anemopaegma laeve* – k. prophylls of the axillary buds; l. fruit. m. *Anemopaegma velutinum* – fruit. n. *Bignonia corymbosa* – inflorescence.

easily distinguished by the glabrous branchlets and leaves (*vs.* sparsely pubescent in *A. coriaceum*) and leaflets with rounded bases and attenuate apices (Fig. 3a) (*vs.* obtuse to attenuate bases and attenuate to acuminate apices in *A. coriaceum*; Fig. 3c). Collected with flowers from August to October.

1.3. ***Adenocalymma coriaceum*** DC., Prodr., 9: 202. 1845. Fig. 3c-d

Liana; branchlets cylindrical, striated, with lenticels, sparsely pubescent, with simple trichomes; prophylls of the axillary buds subulate, not foliaceous, 0.1–0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril; petiole 0.6–1.9 cm long, pubescent, with simple trichome; petiolules 0.5–1.8 cm long, pubescent, with simple trichomes; leaflets coriaceous, 4.9–5.6 × 2.5–5.4 cm, elliptic, base obtuse to attenuate, apex attenuate to acuminate, margin entire, not revolute, discolor, adaxial surface sparsely pubescent, with glandular trichomes, abaxial surface sparsely pubescent, with

simple trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles 0.2–0.4 cm long, elliptic. Calyx cupular, coriaceous, 0.3–0.7 × 0.3–0.8 cm, minutely 5-apiculated, green, densely tomentose, with simple trichomes; corolla infundibuliform, membranaceous, 3.8–5.3 × 2.2–4.9 cm, yellow, externally tomentose, with simple and glandular trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 2.3–3.1 cm long, ventral filaments 2.0–2.8 cm long, staminode ca. 0.3 cm long; ovary elliptic, not stipitate, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 3.4 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Fruits and seeds not seen.

Selected Material: Igarassu, Usina São José, 12.III.2003, fl., *A. Melquíades 73* (PEUFR). Jaqueira, RPPN Frei Caneca, Mata do Jasmim, 08º43'40"S, 35º50'29"W, 20.IX.2011, fl., *E.D. Mendonça et al. 67* (JPB).

Adenocalymma coriaceum is endemic to Brazil, where it occurs in Atlantic forest, in the states of Alagoas, Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and Sergipe (Lohmann 2010; Fonseca & Lohmann 2019). This species is reported to Pernambuco for the first time. *Adenocalymma coriaceum* is most similar to *A. comosum*. The similarities and differences among those species are discussed under *A. comosum*. Collected with flowers from March to June and September to October.

1.4. *Adenocalymma cristicalyx* (A.H.Gentry) L.G. Lohmann in Lohmann & Taylor, Ann. Missouri Bot. Gard., 64(2): 316, 1977. Fig. 7a-b

Liana; branchlets cylindrical, smooth, with lenticels, glabrous; prophylls of the axillary buds subulate, not foliaceous, 0.2–0.3 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril; petiole 2.5–4.0 cm long, glabrous; petiolules 0.5–1.3 cm long, glabrous; leaflets chartaceous, 3.5–7.8 × 1.6–3.5 cm, elliptic, base subcordate to rounded, apex attenuate to acuminate, margin entire, irregulary serrate or crenate, not revolute, discolor, adaxial surface glabrous, abaxial surface densely lepidote, venation brochidodromous. Inflorescence a raceme, terminal; bracts and bracteoles ca. 0.3 cm long, lanceolate. Calyx cupular, coriaceous, 0.6–0.8 × 0.3–0.4 cm, truncate to minutely 5-apiculate, green, glabrous, ciliated only in the margin, with simple trichomes; corolla infundibuliform, membranaceous, 3.0–5.9 × 0.8–1.0 cm, yellow, lobes pink, sparsely pubescent, with glandular trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 2.3–2.7 cm long, ventral filaments 1.9–2.2 cm long, staminode ca. 0.3 cm long; ovary elliptic, not stipitate, ca. 0.4 × 0.1 cm, smooth, glabrous, style ca. 3.1 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, 13.4–34.5 × 0.8–1.2 cm, woody, slightly inflated, 2-parted, base and apex attenuate, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Limoeiro, 7.II.1990, fl. and fr., *D. Belo 172* (PEUFR). Chã de Alegria, 8.I.1933, fl. and fr., *B. Pickel 3195* (IPA).

Adenocalymma cristicalyx is endemic to the Brazilian Caatinga, where it occurs in Bahia, Ceará, Minas Gerais, Paraiba, and Pernambuco (Lohmann 2010; Fonseca & Lohmann 2019). *Adenocalymma cristicalyx* can be recognized by the leaves with margins entire, irregularly serrate or crenate, terminal inflorescences, green calyx, and corolla yellow with pink lobes (Fig. 7a). Collected with flowers and fruits from November to February.

2. *Amphilophium* Kunth, J. Phys. Chim. Hist. Nat. Arts 87: 451. 1818, emend L.G. Lohmann.

Lianas; branchlets hexagonal, inodorous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a raceme, axillary. Calyx cupular, coriaceous, with cupular glands, not spongy; corolla infundibuliform or tubular, white or light yellow, sometimes with pink lobes, coriaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth, pubescent; disk annular. Capsule elliptic, not stipitate, inflated, woody, 2-parted, without lenticels, calyx caducous; seeds winged, wings hyaline.

Amphilophium comprises 47 species distributed through dry to wet forests and savannas from México and the Antilles to Argentina and Brazil (Lohmann & Taylor 2014). In Brazil, 28 species occur, 12 of which are endemic (Lohmann 2010). Three species are found in Pernambuco, *A. crucigerum*, *A. paniculatum*, and *A. scabriusculum*.

Key for the identification of species of *Amphilophium* from Pernambuco

1. Calyx with a double rim; corolla tubular ..... 2.2. *Amphilophium paniculatum*
1'. Calyx with a single rim; corolla infundibuliform 2
   2. Branchlets, leaflets, calyx and corolla with simple trichomes; leaflets ovate to cordate; corolla white outside, yellow inside ..... 2.1. *Amphilophium crucigerum*
   2'. Branchlets, leaflets, calyx and corolla with dendritic trichomes; leaflets elliptic; corolla light yellow with pink lobes on both sides ..... 2.3. *Amphilophium scabriusculum*

2.1. *Amphilophium crucigerum* (L.) Lohmann, Nuevo Cat. Fl. Vasc. Venezuela, 270, 2008. Fig. 3e-g

Liana; branchlets hexagonal, striated, without lenticels, densely tomentose to pubescent, with simple trichomes; prophylls of the axillary buds lanceolate, foliaceous, ca. 0.2 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a trifid tendril; petiole 0.9–9.2 cm long, tomentose, with simple trichomes; petiolules 0.3–6.2 cm long, tomentose, with simple trichomes; leaflets membranaceous, 4.3–15.7 × 1.7–10.3 cm, ovate to cordate, base truncate to cordate, apex acute to acuminate, margin entire, not revolute, concolor, densely tomentose to pubescent on both sides, with simple trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles ca. 0.3 cm long, lanceolate. Calyx cupular, coriaceous, 0.9–1.5 × 0.9–1.4 cm, with a single rim, truncate to minutely 5-apiculate, green, densely tomentose, with simple trichomes; corolla infundibuliform, coriaceous, 2.7–7.1 × 1.5–2.5 cm, white outside, yellow inside, externally tomentose, with simple trichomes; stamens included, anthers ca. 0.4 cm long, glabrous, dorsal filaments 1.0–1.2 cm long, ventral filaments 0.4–0.6 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.4 × 0.1 cm, smooth, pubescent, with simple trichomes, style ca. 2.5 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule oblong, 7.2–25.5 × 2.7–5.3 cm, flattened, 2-parted, base and apex acute, echinate, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 1.3–3.7 × 1.5–3.0 cm, wings membranaceous.

Selected Material: Venturosa, Parque Municipal Pedra Furada, 22.IV.2008, fl., *P. Gomes et al. 827* (UFP). Paudalho, Centro de Instrução Marechal Newton Cavalcanti, 6.VIII.2011, fr., *B.S. Amorim 1119* (UFP).

Amphilophium crucigerum occurs in semideciduous to evergreen forests and disturbed vegetation from Mexico to Argentina (Lohmann & Taylor 2014). It is broadly distributed throughout Brazil, where it occurs in all states and phytogeographical domains (Lohmann 2010). In Pernambuco, it was found growing in Caatinga and Atlantic forest domains. *Amphilophium crucigerum* can be recognized by the trifid tendril, leaflets ovate to cordate, truncate to minutely 5-apiculate calyx (Fig. 3e), corolla infundibuliform, white externally, and yellowish inside. The fruit is echinate (Fig. 3g) leading to the common name "monkey's comb." This species is morphologically similar to *A. scabriusculum*, from which it can be differentiated by the branchlets, leaves, calyx, and corolla covered by simple trichomes (*vs.* covered by dendritic trichomes in *A. scabriusculum*), leaflets ovate to cordate (*vs.* elliptic in *A. scabriusculum*), and corolla white (*vs.* light yellow, with pink lobes in *A. scabriusculum*). Collected with flowers from December to April, and with fruits from August to December and May.

2.2. *Amphilophium paniculatum* (L.) Kunth, Nov. Gen. Sp. Pl., (quarto ed.) 3: 148, 1819. Fig. 7c-d

Liana; branchlets hexagonal, striated, without lenticels, pubescent on angles, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet always modified into a trifid tendril; petiole 2.8–3.5 cm long, pubescent, with simple trichomes; petiolules 1.3–1.5 cm long, pubescent, with simple trichomes; leaflets membranaceous, 2.8–8.9 × 3.5–5.4 cm, ovate to elliptic, base rounded to truncate, apex acute to acuminate, margin entire, not revolute, concolor, densely lepidote on both sides, adaxial surface pilose only in primary vein, with simple trichomes, venation brochidodromous. Inflorescence a raceme, terminal; bracts and bracteoles 0.6–1.2 cm long, lanceolate. Calyx cupular, coriaceous, 0.5–1.3 × 0.6–0.9 cm, with a double rim, internal rim 2–3-labiate, external part undulated, green, densely lepidote; corolla tubular, coriaceous, 2.5–3.6 × 0.8–1.2 cm, light yellow to lilac, externally pubescent, with simple trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments

2.3–2.7 cm long, ventral filaments 2.0–2.3 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.2 × 0.1 cm, smooth, pubescent, simple trichomes, style ca. 2.9 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule elliptic, ca. 11.1 × 4.9 cm, woody, inflated, 2-parted, base and apex cuneate, lepidote, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 0.8–1.5 × 2.1–2.5 cm, wings membranaceous.

Selected Material: Arcoverde, Serra das Varas, 14.IX.2006, fr., *O. Cano* (IPA 73405). Triunfo, 26.II.1986, fl., *V.C. Lima & F. Galindo 130* (IPA).

Amphilophium paniculatum is distributed through wet to dry forest vegetation from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and phytogeographical domains (Lohmann 2010). In Pernambuco, it is broadly distributed through "brejos de altitude" and Caatinga. *Amphilophium paniculatum* can be recognized by the calyx with a double rim, 2–3-labiated internally and undulated externally (Fig. 7d), tubular corollas (Fig. 7c), and fruits that are inflated, woody and lepidote. Collected with flowers from November to June, and with fruits from April to September.

2.3. *Amphilophium scabriusculum* (Mart. *ex* DC.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 408, 2014. Fig. 3h

Liana; branchlets hexagonal, striated, without lenticels, pubescent, with dendritic ferruginous trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a trifid tendril; petiole 0.4–2.0 cm long, densely pubescent, with dendritic ferruginous trichomes; petiolules 0.4–0.8 cm long, densely pubescent, with dendritic ferruginous trichomes; leaflets chartaceous, 3.2–8.7 × 1.4–5.3 cm, elliptic, base rounded, apex acute to cuspidate, margin entire, not revolute, discolor, adaxial surface sparsely lepidote, abaxial surface pubescent only in primary vein, with dendritic trichomes, venation brochidodromous. Inflorescence a raceme, terminal; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx cupular, coriaceous, 0.4–0.6 × 0.5–0.7 cm, with a single rim, truncate to minutely 5-apiculate, green, densely tomentose, with dendritic trichomes; corolla infundibuliform, coriaceous, 4.0–6.2 × 1.3–1.6 cm, tube light yellow and lobes pink on both sides, externally densely tomentose, with dendritic trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.8–1.9 cm long, ventral filaments 1.2–1.4 cm long, staminode ca. 0.4 cm long; ovary ovoid, sessile, ca. 0.4 × 0.2 cm, smooth, puberulous, with simple trichomes, style ca. 3.0 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Capsule elliptic, ca. 6.0 × 3.4 cm, woody, flattened, 2-parted, base acute, apex acute to apiculate, densely tomentose, with dendritic trichomes, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Examined Material: Paulista, 4.VIII.1966, fl., *E. Tenório 66/158* (IPA).

Additional Examined Material: BRAZIL. MINAS GERAIS: Serra do Espinhaço, Pico de Itambé, 9.II.1972, fl. and fr., *W.R. Anderson et al. 35669* (NY).

Amphilophium scabriusculum is endemic to the Brazilian Atlantic forest, where it grows from Paraiba to Espirito Santo and Minas Gerais (Lohmann 2010). In Pernambuco, a single individual was collected growing in disturbed Atlantic forest. *Amphilophium scabriusculum* can be recognized by the branchlets, leaves, calyx, corolla, and fruit covered by dendritic trichomes, elliptic leaflets, corolla light yellow with pink lobes, and fruit flattened with densely tomentose surface (Fig. 3h). The similarities with *A. crucigerum* are discussed under that species' comments. Collected with flowers in February.

3. *Anemopaegma* Martius *ex* Meisner, Pl. Vasc. Gen. 1: 300, 2: 208. 1840.

Lianas or shrubs; branchlets cylindrical, inodorous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple or trifid tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a raceme, axillary. Calyx cupular, coriaceous, without cupular glands, not spongy; corolla infundibuliform, white or yellow, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary stipitate, smooth, lepidote; disk annular. Capsule elliptic to wide-elliptic, stipitate, flattened, coriaceous, 2-parted, without lenticels, calyx persistent; seeds winged, wings hyaline.

Anemopaegma includes 45 species distributed through dry to wet forests, Caatinga, and savannahs from Mexico to Argentina and Brazil (Lohmann & Taylor 2014). In Brazil, 36 species occur, 13 of which are endemic (Lohmann 2010). Five species are found in Pernambuco, *A. album*, *A. citrinum*, *A. gracile*, *A. leave*, and *A. velutinum.*

Key for the identification of species of *Anemopaegma* from Pernambuco

1. Prophylls of the axillary buds triangular and minute 2
   2. Shrubs; leaves always 3-foliolate, without tendrils; calyx 2-lobed and pubescent ..... 3.1. *Anemopaegma album*
   2'. Lianas; leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril; calyx truncate and glabrous ..... 3.2. *Anemopaegma citrinum*

1'. Prophylls of the axillary buds well-developed 3
   3. Simple tendrils; prophylls of the axillary buds wide-elliptic to elliptic, foliaceous ..... 3.4. *Anemopaegma laeve*
   3'. Trifid tendrils; prophylls of the axillary buds cymbiform, not foliaceous 4
      4. Branchlets, leaves and calyx densely velutinous; calyx cupular ..... 3.5. *Anemopaegma velutinum*
      4'. Branchlets, leaves and calyx glabrous to sparsely pubescent; calyx wide-cupular ..... 3.3. *Anemopaegma gracile*

3.1. *Anemopaegma album* Mart. *ex* DC., Prodr., 9: 188, 1845. Fig. 3i

Shrub; branchlets cylindrical, striated, without lenticels, pubescent, with simple trichomes; prophylls of the axillary buds minute, not foliaceous, ca. 0.1 cm long, glabrous. Leaves always 3-foliolate, without tendrils; petiole 1.2–3.9 cm long, pubescent, with simple trichomes, not uncinate; petiolules 0.5–1.2 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.3–7.8 × 1.2–4.1 cm, elliptic to ovate, base obtuse to rounded, apex retuse to attenuate, margin entire, not revolute, discolor, densely pubescent, with simple and glandular trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles ca. 0.2 cm long, cymbiform. Calyx cupular, coriaceous, 0.3–1.0 × 0.4–1.1 cm, 2-lobed, green, not spongy, pubescent, with simple and glandular trichomes; corolla infundibuliform, membranaceous, 2.3–7.3 × 1.3–2.2 cm, cream with yellow lobes, externally lepidote and sparsely pubescent, with glandular trichomes; stamens included, anthers 0.3–0.4 cm long, glabrous, dorsal filaments 1.9–2.2 cm long, ventral filaments 1.7–1.9 cm long, staminode ca. 0.3 cm long; ovary elliptic, stipitate, ca. 0.2 × 0.2 cm, smooth, glabrous, style ca. 2.3 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Capsule elliptic, 3.3–6.1 × 3.0–4.2 cm, woody, slightly inflated, 2-parted, base rounded, apex obtuse, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds wide–elliptic, 1.4–3.0 × 1.1–2.5 cm, wide-elliptic, wings membranaceous. **Selected Material**: Triunfo, 10.III.1995, fl., *A.M. Miranda 2150* (HUEFS). Recife, Santuário dos Três Reinos, 24.IX.2013, fl., *M. Sobral-Leite 1292* (UFP). **Additional Examined Material**: BRAZIL. BAHIA: Morro do Chapéu, 28.IV.2009, fl., *D. Araújo et al. 715* (HVASF); 31.VII.1985, fr., *M. Ataidei 338* (IPA).

Anemopaegma album is endemic to Brazil, where it occurs in Caatinga, Cerrado, and Atlantic forest vegetation from the states of Ceará, Pernambuco, Bahia, and Minas Gerais (Lohmann 2010). In Pernambuco, it was collected growing in Caatinga and Atlantic forest domains. *Anemopaegma album* can be recognized by the lack of tendrils, minute prophylls of the axillary buds, and calyx 2-lobed (Fig. 3i). It is morphologically similar to *A. citrinum*, both of which lack prophylls of the axillary buds, but can be distinguished by the shrubby habit (*vs.* liana habit in *A. citrinum*), lack of tendrils (*vs.* trifid tendril in *A. citrinum*), calyx 2-lobed and pubescent (*vs.* calyx truncate and glabrous in *A. citrinum*). Collected with flowers in September, November, and March.

3.2. *Anemopaegma citrinum* Mart. *ex* DC., Prodr., 9: 189, 1845. Fig. 7e-f

Liana; branchlets cylindrical, striated, without lenticels, glabrous; prophylls of the axillary buds triangular and minute, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.6–1.9 cm long, glabrous; petiolules 0.3–0.5 cm long, glabrous; leaflets chartaceous, 4.3–7.1 × 1.9–3.3 cm, elliptic, base obtuse, apex acuminate, margin entire, revolute, discolor, adaxial surface sparsely pubescent, with glandular trichomes, abaxial surface pubescent, with glandular trichomes, venation brochidodromous. Inflorescence a reduced raceme, axillary; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx

cupular, coriaceous, 0.5–1.0 × 0.5–0.9 cm, truncate, green, not spongy, glabrous, with glandular trichomes near the apex; corolla infundibuliform, membranaceous, 3.3–6.9 × 1.2–3.1 cm, yellow, externally lepidote, with simple trichomes along the lobe margin; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.8–2.0 cm long, ventral filaments 1.6–1.8 cm long, staminode ca. 0.2 cm long; ovary elliptic, stipitate, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 3.1 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. *Capsule* elliptic, 4.2–10.1 × 3.3–7.2 cm, woody, slightly inflated, 2-parted, base and apex obtuse, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds wide-elliptic, 1.3–1.8 × 1.1–1.5 cm, wings membranaceous.

Selected Material: Itamaracá, Mata do Engenho Macaxeira, 30.III.1996, fl., *A. Laurênio 989* (UFP). Serra Talhada, 21.III.2014, fr., *D.N. Silva & A.P.S. Gomes 10* (HESBRA).

Anemopaegma citrinum occurs in dry forests, Carrasco, and Cerrado vegetation from eastern Bolivia to Brazil (Lohmann & Taylor 2014). In Brazil, it occurs in Caatinga and Cerrado from the states of Maranhão, Piauí, Paraiba, Pernambuco, Bahia, and Minas Gerais (Lohmann 2010). In Pernambuco, this species was found growing in Caatinga and Atlantic Forest vegetation, where it was found in "Mata do Engenho Macaxeira" within the municipality of Itamaracá. *Anemopaegma citrinum* can be recognized by the trifid tendrils (Fig. 7f), minute prophylls of the axillary buds, and elliptic fruit with obtuse bases and apices. This species is most similar to *Anemopaegma album*, which also bears minute prophylls; differences between these species are discussed under *A. album*. Collected with flowers from February to April, and fruits in March.

3.3. *Anemopaegma gracile* Bureau & K. Schumann, *Fl. bras.*, 8(2): 132, 1896. Fig. 3j

Liana; branchlets cylindrical, striated, without lenticels, glabrous to sparsely pubescent, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.9–2.8 cm long, pubescent, with simple trichomes; petiolules 0.3–0.6 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.1–5.9 × 1.3–2.4 cm, elliptic to oblong-elliptic, base obtuse, apex acuminate to obtuse, margin entire, not revolute, discolor, sparsely pubescent, with simple and glandular trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx wide-cupular, coriaceous, 0.6–1.1 × 0.9–1.4 cm, truncate, green, not spongy, glabrous; corolla infundibuliform, membranaceous, 3.9–6.1 × 0.8–1.6 cm, yellow, externally lepidote; stamens inserted, anthers 0.2–0.3 cm long, glabrous, dorsal filaments 1.5–1.9 cm long, ventral filaments 1.3–1.4 cm long, staminode ca. 0.3 cm long; ovary elliptic, stipitate, ca. 0.3 × 0.1 cm, smooth, glabrous, style ca. 2.0 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule elliptic, 3.1–5.2 × 2.9–5.0 cm, woody, slightly inflated, 2-parted, base rounded, apex attenuate, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds wide-elliptic, 1.7–2.4 × 1.5–2.1 cm, wings membranaceous.

Selected Material: Petrolina, Fazenda Mamão do Mato, 28.III.1993, fr., *J.L.S. Lima 135* (HUEFS). Araripina, 12.XII.1997, fl., *A.M. Miranda et al. 2906* (HUEFS).

Anemopaegma gracile is endemic to Brazil, where it occurs in Cerrado and Atlantic forest vegetation from the Distrito Federal, Goiás, Minas Gerais, and Rio de Janeiro (Lohmann 2010). This species is here reported to Pernambuco for the first time. The apparently disjunct distribution of this species can be due to a lack of herbarium records in localities where the species might occur. *Anemopaegma gracile* can be recognized by the glabrous to sparsely pubescent branchlets, leaves and calyx, trifid tendrils, prophylls minute and cymbiform, and calyx wide-cupular (Fig. 3j). *Anemopaegma gracile* is morphologically similar to *A. velutinum*, with which it shares trifid tendrils, prophylls minute and cymbiform, and leaflets discolor. These species can be distinguished by the sparsely pubescent branchlets, leaves, and calyx of *A. gracile* (*vs.* indument velutinous in *A. velutinum*), and calyx wide-cupular (*vs.* calyx cupular in *A. velutinum*). Collected with flowers from December to February, and fruits from December to March.

3.4. *Anemopaegma laeve* DC., Prodr., 9: 189, 1845. Fig. 3k-l

Liana; branchlets cylindrical, striated, without lenticels, glabrous to velutinous, with simple trichomes; prophylls of the axillary buds wide-elliptic to elliptic, foliaceous, 0.4–2.0 × 0.4–1.5, glabrous to velutinous, with simple trichomes, not uncinate. Leaves 2–3-foliolate, with the

terminal leaflet often modified into a simple tendril; petiole 1.8–4.3 cm long, glabrous to velutinous, with simple trichomes; petiolules 0.5–0.8 cm long, glabrous to velutinous, simple trichomes; leaflets chartaceous, 3.3–7.2 × 1.0–3.9 cm, elliptic to ovate, base cordate, apex attenuate to acuminate, margin entire, revolute, slightly discolor, glabrous to velutinous, with simple trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles 0.2–0.3 cm long, cymbiforms. Calyx cupular, coriaceous, 0.9–1.3 × 0.5–0.6 cm, truncate, green, not spongy, glabrous to pubescent, with simple and glandular trichomes; corolla infundibuliform, membranaceous, 3.1–6.9 × 1.5–2.7 cm, yellow, lepidote; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 2.7–2.9 cm long, ventral filaments 1.8–2.0 cm long, staminode ca. 0.4 cm long; ovary elliptic, stipitate, ca. 0.3 × 0.2 cm, style ca. 2.1 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Capsule elliptic, 6.1–8.6 × 3.9–5.8 cm, woody, slightly inflated, 2-parted, base and apex cuneate, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds wide-elliptic, ca. 2.9 × 3.6 cm, wings membranaceous.

Selected Material: Floresta, Fazenda Rabeca, 08º16'03"S, 38º10'11"W, 11.II.2001, fl., *M.J.N Rodal & A.C.B.L. Silva 821* (PEUFR). Ibimirim, 10.III.1995, fr., *A.P.S. Gomes et al. 10* (PEUFR).

Anemopaegma laeve is endemic to Brazil, where it grows in Caatinga and Cerrado vegetation from the states of Maranhão, Piauí, Ceará, Paraiba, Pernambuco, Bahia, and Minas Gerais (Lohmann 2010). In Pernambuco it was found growing in Caatinga vegetation. The indument of *Anemopaegma laeve* ranges from glabrous to densely velutinous. *Anemopaegma leave* is the only species of *Anemopaegma* in Pernambuco with prophylls of the axillary buds wide-elliptic and foliaceous (Fig. 3k), and elliptic fruit with cuneate base and apex (Fig. 3l). Collected with flowers and fruits from August to March.

3.5. *Anemopaegma velutinum* Martius. *ex* DC., Prodr., 9: 189, 1845. Fig. 3m

Shrub; branchlets cylindrical, striated, without lenticels, densely velutinous, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.2 cm long, velutinous, with simple trichomes. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril; petiole 4.3–5.0 cm long, densely velutinous, with simple and glandular trichomes, not uncinate; petiolules 0.4–0.9 cm long, densely velutinous, with simple and glandular trichomes; leaflets membranaceous, 4.2–12.5 × 2.1–5.0 cm, elliptic to ovate, base rounded to acuminate, apex cuneate to rounded, margin entire, revolute, discolor, adaxial surface pubescent, with simple trichomes, abaxial surface densely velutinous, with simple trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles ca. 0.2 cm long, cymbiform. Calyx cupular, coriaceous, 0.6–0.8 × 1.2–1.5 cm, truncate, green, not spongy, densely velutinous, with simple trichomes; corolla infundibuliform, membranaceous, ca. 5.5 × 1.7 cm, yellow, lepidote; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments ca. 2.2 cm long, ventral filaments ca. 1.8 cm long, staminode ca. 0.3 cm long; ovary elliptic, stipitate, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 2.4 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule wide-elliptic, 7.5–8.0 × 6.8–7.2 cm, woody, slightly inflated, 2-parted, base and apex rounded, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds wide-elliptic, 2.4–3.1 × 1.8–2.5 cm, wings membranaceous.

Examined Material: Ibimirim, 19.I.1994, fl., *A.M. Miranda 1223* (JPB).

Additional Examined Material: BRAZIL. CEARÁ: Jaburuna, Ubajara, 28.IV.1994, fr., *F.S. Araújo 549* (EAC). Tianguá, 13.XI.1988, fl., *M.A. Neto* (EAC 15821).

Anemopaegma velutinum is endemic to Brazil, where it occurs in Caatinga and Cerrado vegetation from the states of Piauí, Bahia, and Minas Gerais (Lohmann 2010). This species is reported to Pernambuco for the first time, where a single specimen was collected in the municipality of Ibimirim, growing in Caatinga vegetation. *Anemopaegma velutinum* can be recognized by the branchlets, prophylls, leaves, and calyx velutinous with simple trichomes, trifid tendril, prophylls minute and cymbiform, and wide-elliptic fruit with rounded base and apex (Fig. 3m). It is morphologically similar to *A. gracile*; the differences between these species are discussed under *A. gracile*. Collected with flowers in January.

4. *Bignonia* L.Sp. Pl. 622. 1753.

Lianas; branchlets cylindrical, inodorous. Leaves 2-foliolate, with the terminal leaflet always modified into a simple tendril, tips without adhesive disks, not uncinate; petiole and

petiolules articulated. Inflorescence a raceme or cyme, terminal or axillary. Calyx cupular or spathaceous, coriaceous, without cupular glands, not spongy; corolla infundibuliform, pink or lilac, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth or verrucose, glabrous; disk reduced or absent. Capsule linear or elliptic, not stipitate, flattened or inflated, coriaceous, 2-parted, glabrous, without lenticels, calyx caducous; seeds winged, wings hyaline.

Bignonia includes 28 species distributed through dry to wet forests, and Caatinga vegetation from the U.S.A. to Argentina and Brazil (Lohmann & Taylor 2014). In Brazil, 20 species occur, two of which are endemic (Lohmann 2010). Three species are found in Pernambuco, *B. corymbosa*, *B. ramentacea*, and *B. sciuripabulum.*

Key for the identification of species of *Bignonia* from Pernambuco

1. Inflorescence with flattened peduncles; calyx spathaceous, apiculate on apex; ovary smooth .... 4.1. *Bignonia corymbosa*
1'. Inflorescence without flattened peduncles; calyx cupular, 5-apiculated; ovary verrucose 2
   2. Branchlets, leaves, calyx and corolla pubescent; leaves elliptic to oblong-elliptic .... 4.2. *Bignonia ramentacea*
   2'. Branchlets, leaves, calyx and corolla glabrous; leaves ovate to obovate..... ..... 4.3. *Bignonia sciuripabulum*

4.1. *Bignonia corymbosa* (Vent.) L.G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela, 272, 2008. Fig. 3n

Liana; branchlets cylindrical, striated, with lenticels, densely lepidote; prophylls of the axillary buds orbicular, foliaceous, ca. 0.2 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet always modified into a simple tendril, not uncinate; petiole 1.5–2.4 cm long, lepidote; petiolules 0.5–1.1 cm long, lepidote; leaflets chartaceous, 3.4–10.8 × 2.3–6.1 cm, elliptic, base rounded to truncate, apex attenuate, margin entire, not revolute, discolor, lepidote, venation brochidodromous. Inflorescence a dicasial cyme, axillary, with flattened peduncles; bracts and bracteoles absent. Calyx spathaceous, coriaceous, 2.3–4.1 × 0.5–1.5 cm, apiculate, light yellow, not spongy, lepidote and pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, 4.2–7.3 × 2.1–3.3 cm, light pink, externally pubescent, with simple trichomes; stamens inserted, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.8–2.1 cm long, ventral filaments 1.6–1.8 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 2.0 cm long, stigma ca. 0.2 cm long, rhombic, glabrous; disk reduced or absent. Capsule linear, ca. 31.3 × 1.8 cm, coriaceous, flattened, 2-parted, base rounded, apex obtuse, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Goiana, Estação Experimental do IPA, fl., *R. Pereira 129* (IPA). Igarassu, Mata dos Macacos, 16.IV.2008, fl., *J. Irapuan & J.S. Marques 23* (IPA).

Additional Examined Material: BRAZIL. DISTRITO FEDERAL: Brasília, bacia do Rio São Bartolomeu, 29.IV.1980, fl. and fr., *Heringer E.P. et al. 4545* (MO).

Bignonia corymbosa grows in semideciduous to evergreen forest and disturbed vegetation from the Lesser Antilles to Bolivia (Lohmann & Taylor 2014). In Brazil, it occurs in almost all states, except from the most southern ones, where it grows in the Amazon, Cerrado, and Atlantic forest vegetation (Lohmann 2010). In Pernambuco, it was found growing in Atlantic forest. *Bignonia corymbosa* can be recognized by the prophylls of the axillary buds minute and orbicular, the dicasial cyme inflorescence with flattened peduncles (Fig. 1n), the calyx spathaceous with apex apiculate, and the fruit linear and flattened. Collected with flowers from February to October.

4.2. *Bignonia ramentacea* (Mart. *ex* DC.) L.G.Lohmann, Ann. Missouri Bot. Gard., 99(3): 422, 2014. Figs. 4a-b; 7g-h

Liana; branchlets cylindrical, striated, with sparsely lenticels, pubescent, with simple trichomes; prophylls of the axillary buds subulate, foliaceous, 0.2–0.4 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet always modified into a simple tendril, not uncinate;

petiole 1.7–2.8 cm long, pubescent, with simple trichomes; petiolules 0.5–1.0 cm long, pubescent, with simple trichomes; leaflets chartaceous, 4.1–15.3 × 3.0–7.2 cm, elliptic to oblong-elliptic, base rounded to cuneate, apex acuminate to rounded, margin entire, not revolute, concolor, pubescent, with simple trichomes, venation brochidodromous. Inflorescence a raceme, terminal, without flattened peduncles; bracts and bracteoles absent. Calyx cupular, coriaceous, 0.3–0.9 × 0.3–0.6 cm, 5-apiculated, green, not spongy, pubescent, with simple trichomes; corolla infundibuliform, membranaceous, 3.3–7.5 × 0.8–1.5 cm, lilac, pubescent, with simple trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.3–1.7 cm long, ventral filaments 0.8–1.0 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.3 × 0.2 cm, verrucose, glabrous, style ca. 2.6 cm long, stigma ca. 0.3 cm long, rhombic, glabrous; disk reduced or absent. Capsule elliptic to oblong elliptic, 6.8–9.7 × 1.8–2.7 cm, chartaceous, flattened, 2-parted, base and apex rounded, echinate, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 2.9–4.7 × 1.5–1.9 cm, wings membranaceous.

Selected Material: Caruaru, Estação Experimental do IPA, 18.V.1992, fr., *F. Guedes 126* (PEUFR). Moreilândia, 07º39'28"S, 39º32'10"W, 13.II.2007, fl., *M.M. Silva-Castro et al. 1141* (HUEFS).

Bignonia ramentacea is endemic to Brazil, where it grows in Caatinga and Cerrado vegetation in the states of Piauí, Ceará, Pernambuco, and Minas Gerais (Lohmann 2010). In Pernambuco, it was found growing in Caatinga vegetation exclusively. *Bignonia ramentacea* is morphologically similar to *B. sciuripabulum* but *B. ramentacea* can be differentiated by the branchlets, leaves, calyx, and corolla pubescent (*vs.* glabrous in *B. sciuripabulum*), the prophylls of the axillary buds subulate and foliaceous (Fig. 4b) (*vs.* minute and triangular in *B. sciuripabulum*; Fig. 4c), and the leaves elliptic to oblong-elliptic (*vs.* ovate to obovate in *B. sciuripabulum*). Collected with flowers from December to February, and fruits from April to September.

4.3. *Bignonia sciuripabulum* (K.Schum.) Lohmann, Nuevo Cat. Fl. Vasc. Venezuela, 272, 2008. Fig. 4c

Liana; branchlets cylindrical, striated, with sparsely lenticels, glabrous; prophylls of the axillary buds triangular, not foliaceous, 0.1–0.2 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet always modified into a simple tendril, not uncinate; petiole 1.0–2.1 cm long, glabrous; petiolules 0.5–1.2 cm long, glabrous; leaflets chartaceous, 3.3–9.4 × 1.5–5.3 cm, ovate to obovate, base rounded, apex attenuate, margin entire, not revolute, concolor, glabrous, venation brochidodromous. Inflorescence a raceme, terminal, without flattened peduncles; bracts and bracteoles absent. Calyx cupular, coriaceous, 0.8–1.8 × 0.5–1.0 cm, 5-apiculated, green, not spongy, lepidote; corolla infundibuliform, membranaceous, 3.2–5.9 × 0.8–1.6 cm, lilac, lepidote; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.3–1.7 cm long, ventral filaments 0.7–0.9 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.3 × 0.2 cm, verrucose, glabrous, style ca. 2.4 cm long, stigma ca. 0.2 cm long, rhombic, glabrous; disk reduced or absent. Capsule oblong-elliptic, 8.9–15.3 × 3.8–4.2 cm, coriaceous, inflated, 2-parted, base cuneate, apex obtuse, echinate, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Caruaru, Estação Experimental do IPA, 1992, fr., *F. Guedes 147* (IPA). Buíque, Serra de Jerusalém, 08º35'1"S, 37º14'26"W, 10.XI.2003, fl., *E.B. Miranda et al. 563* (HUEFS).

Bignonia sciuripabulum is commonly found in evergreen lowland forest vegetation from Colombia to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all phytogeographical domains and in almost all Brazilian states(Lohmann 2010). *Bignonia sciuripabulum* is reported to Pernambuco for the first time, where it was collected growing in Caatinga vegetation. *Bignonia sciuripabulum* can be recognized by the branchlets, leaves, calyx, and corolla glabrous, prophylls of the axillary buds minute and triangular (Fig. 4c), leaves ovate to obovate, and echinate fruits. The differences between *B. sciuripabulum* and *B. ramentacea* are discussed under *B. ramentacea*. Collected with flowers from November to February, and fruits in March and June.

5. *Callichlamys* Miq., Linnaea 18: 254. 1845.

Callichlamys is a monospecific genus, only including *Callichlamys latifolia* (Lohmann & Taylor 2014).

5.1. *Callichlamys latifolia* (Rich.) K. Schum., Nat. Pflanzenfam. 4(3b): 223. 1894. Fig. 4d

Liana; branchlets cylindrical, striated, with lenticels, pubescent, with simple and dendritic

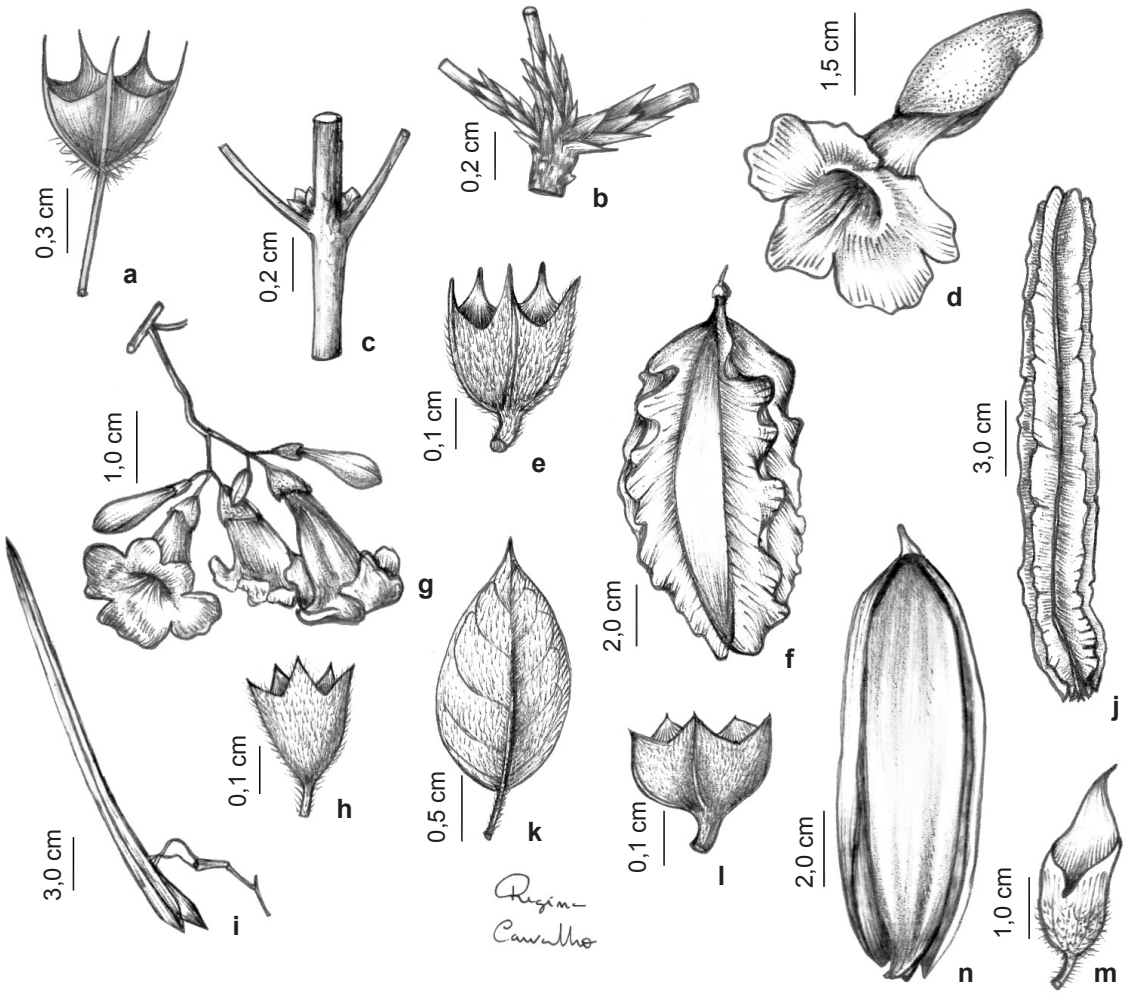

Figure 4 – a-b. *Bignonia ramentacea* – a. calyx; b. prophylls of the axillary buds. c. *Bignonia sciuripabulum* – prophylls of the axillary buds. d. *Callichlamys latifolia* – flower. e-f. *Cuspidaria argentea* – e. calyx; f. fruit. g-i. *Cuspidaria lateriflora* – g. inflorescence; h. calyx; i. fruit. j. *Cuspidaria octoptera* – fruit. k-l. *Cuspidaria simplicifolia* – k. leaf; l. calyx. m-n. *Dolichandra quadrivalvis* – m. calyx; n. fruit.

trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0,1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 8.9–12.1 cm long, pubescent, with glandular and dendritic trichomes; petiolules 0.4–1.0 cm long, pubescent, with glandular and dendritic trichomes; leaflets coriaceous, 4.2–15.3 × 2.9–8.7 cm, elliptic to wide-elliptic, base truncate to subcordate, apex acuminate to rounded, margin entire, not revolute, discolor, pubescent, with dendritic trichomes, venation brochidodromous. Inflorescence a raceme, axillary; bracts and bracteoles absent. Calyx spathaceous, coriaceous, 2.2–3.1 × 1.5–1.8 cm, bilabiate, spongy, yellow to light yellow, pubescent, with glandular and dendritic trichomes; corolla infundibuliform, coriaceous, 6.8–8.3 × 1.5–1.8 cm, yellow, externally lepidote; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.9–2.5 cm long, ventral filaments 1.3–1.5 cm long, staminode ca. 0.2 cm long; ovary ovate, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 4.6 cm long, stigma ca. 0.3 cm long, lanceolate; disk annular. Fruits and seeds not seen**.** **Selected Material**: Moreno, Reserva Ecológica de Carnijó, Mata do Visgueiro, 3.IV.2003, fl., *R. Pereira et al. 9* (IPA). São Vicente Férrer, Mata do Estado, 07º35’00”S, 35º30’00”W, 29.I.1999, fl., *E.M.N. Ferraz 593* (MO).

Callichlamys latifolia is found in wet to dry forest vegetation from Mexico to Brazil (Lohmann & Taylor 2014). In Brazil, it occurs in rainforests, Cerrado, and Caatinga vegetation from the states of Amazonas to Minas Gerais and Maranhão to São Paulo (Lohmann 2010). This species is reported to Pernambuco for the first time, where it was found growing in Caatinga and Atlantic forest vegetation. *Callichlamys latifolia* can be recognized by the branchlets, leaves, and calyx covered by dendritic trichomes and by the spathaceous, bilabiate, and spongy calyx (Fig. 4c). Collected with flowers in January, April, and October.

6. *Cuspidaria* DC., Biblioth. Universelle Genève, sèr. 2, 17:125. Oct. 1838.

Lianas; branchlets cylindrical, inodorous. Leaves 1–3-foliolate, with the terminal leaflet otften modified into a simple tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a compound thyrse, axillary or terminal. Calyx cupular, membranaceous, without cupular glands, not spongy; corolla infundibuliform, pink, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, forward-curved; ovary sessile, smooth, lepidote; disk annular. Capsule linear, not stipitate, flattened, woody, 2-parted, with lenticels, calyx caducous; seeds winged, wings hyaline.

Cuspidaria comprises 19 species distributed through dry to wet forests, Caatinga, and Cerrado from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, 18 species occur, nine of which are endemic (Lohmann 2010). Four species are found in Pernambuco, *C. argentea*, *C. lateriflora*, *C. octoptera*, and *C. simplicifolia.*

Key for the identification of species of *Cuspidaria* from Pernambuco

1. Calyx lobes acuminate 2
   2. Leaves 2-foliolate, membranaceous; calyx lobes acuminate; corolla > 2.4 cm long..... ..... 6.3. *Cuspidaria octoptera*
   2’. Leaves 1-foliolate, chartaceous; calyx lobes mucronate; corolla ≤ 2.4 cm long .... 6.4. *Cuspidaria simplicifolia*

1’. Calyx lobes acute or attenuated 3

3. Inflorescence terminal; fruit 4-winged, without a longitudinal rib ..... 6.1. *Cuspidaria argentea*

3’. Inflorescence axillar; fruit not winged, with a longitudinal rib..... 6.2. *Cuspidaria lateriflora*

6.1. *Cuspidaria argentea* (Wawra) Sandwith, Kew Bull., 2: 606, 1955. Fig. 4e-f

Liana; branchlets cylindrical, striated, with lenticels, pubescent, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.2 cm long, pubescent in margins, with simple trichomes. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.3–3.1 cm long, densely pubescent, with simple trichomes; petiolules 0.3–0.6 cm long, densely pubescent, with simple trichomes; leaflets chartaceous, 1.3–4.6 × 1.2–3.1 cm, elliptic to ovate, base cuneate to rounded, apex rounded to acuminate, margin entire, not revolute, discolor, adaxial surface sparsely to densely pubescent, with simple trichomes, abaxial surface pubescent predominantly in main veins, with simple trichomes, venation brochidodromous. Inflorescence a compound thyrse, terminal; bracts and bracteoles ca. 0.1 cm long, lanceolate. Calyx cupular, membranaceous, 0.3–0.5 × 0.2–0.4 cm, 5-dentate, pink, not spongy, densely villose, with simple trichomes; corolla infundibuliform, membranaceous, 2.1–7.1 × 0.5–1.7 cm, pink, densely pubescent, with simple and glandular trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.3–1.9 cm long, ventral filaments 0.8–1.4 cm long, staminode ca. 0.3 cm long; ovary ovate, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 2.0 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule oblong-elliptic, 11.3–14.5 × 6.2–8.9 cm, woody, flattened, 2-parted, base and apex rounded, glabrous, without lenticels, with four wings, without a longitudinal rib, margin irregular, calyx persistent; seeds wide-elliptic, 1.1–1.7 × 1.0–1.5 cm, wings membranaceous.

Selected Material: Floresta, 08º34’54”S, 38º20’49”W, 2.IX.2009, fr., *J.G. Carvalho-Sobrinho 2336* (HVASF). Petrolina, 8.XI.1983, fl., *Fotius 3621* (IPA).

Cuspidaria argentea is endemic to Northeastern Brazil, where it is found growing

in Caatinga vegetation from the states of Bahia, Ceará, Maranhão, Pernambuco, and Piauí (Lohmann 2010). *Cuspidaria argentea* can be recognized by the branchlets, leaves, calyx, and corolla densely pubescent, terminal inflorescence, and the four-winged fruit (Fig. 4f). Collected with flowers from November to January, and fruits in April and September.

6.2. *Cuspidaria lateriflora* (Mart.) DC., Prodr., 9: 179, 1845. Fig. 4g-i

Liana; branchlets cylindrical, striated, with lenticels, densely velutinous, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.2–0.4 cm long. Leaves 1–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.5–2.4 cm long, velutinous, with simple trichomes; petiolules 0.5–2.3 cm long, velutinous, with simple trichomes; leaflets chartaceous, 2.1–6.5 × 1.2–3.5 cm, elliptic to ovate, base cordate to cuneate, apex cuneate to acuminate, margin entire, not revolute, discolor, densely velutinous, with simple trichomes, venation brochidodromous. Inflorescence a compound thyrse, axillary; bracts and bracteoles 0.1–0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.2–0.5 × 0.2–0.4 cm, 5-dentate, lilac to pink, not spongy, densely velutinous, with simple and glandular trichomes; corolla infundibuliform, membranaceous, 1.3–5.1 × 0.5–0.8 cm, light lilac to light pink, velutinous, with simple and glandular trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 1.0–1.7 cm long, ventral filaments 0.8–1.2 cm long, staminode ca. 0.3 cm long; ovary ovate, sessile, ca. 0.3 × 0.1 cm, smooth, glabrous, style 1.3–2.0 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. *Capsule* linear, 11.3–32.3 × 0.9–1.3 cm, woody, flattened, 2-parted, base and apex cuneate, glabrous, without lenticels, without wings, with a longitudinal rib, margin entire, calyx persistent; seeds not seen.

Selected Material: Buíque, Vale do Catimbau, 21.XI.2005, fl. and fr., *A. Bocage et al. 1050* (HUEFS). Petrolina, 28.VII.1983, fl. and fr., *G. Fotius 3436* (HUEFS).

Cuspidaria lateriflora is distributed through dry to wet forest vegetation from Peru, Bolivia, and Paraguay (Lohmann & Taylor 2014). In Brazil, it is found in almost all states (Lohmann 2010). In Pernambuco, it was found growing in Caatinga and Atlantic forest vegetation. *Cuspidaria lateriflora* can be recognized by the short axillar inflorescence (Fig. 4g), calyx with acute lobes (Fig. 4h), and ribbed fruit (Fig. 4i). Collected with flowers from July to November and February, and fruits from January to June and November.

6.3. *Cuspidaria octoptera* Gentry, Ann. Missouri Bot. Gard., 64: 314, 1978. Fig. 4j

Liana; branchlets cylindrical, striated, with lenticels, pubescent, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1–0.2 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 2.2–2.9 cm long, pubescent; petiolules 0.8–2.2 cm long, pubescent; leaflets membranaceous, 4.5–6.4 × 2.0–3.5 cm, ovate, base obtuse to rounded, apex acuminate, margin entire, not revolute, discolor, pubescent, with simple trichomes, venation brochidodromous. Inflorescence a compound thyrse, terminal; bracts and bracteoles 0.1–0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.1–0.2 × 0.2–0.3 cm, 5-dentate, lilac, not spongy, pubescent, with simple trichomes; corolla infundibuliform, membranaceous, 2.8–3.3 × 0.8–0.9 cm, lilac externally, white internally, glabrous; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 1.2–1.7 cm long, ventral filaments 0.7–1.2 cm long, staminode ca. 0.2 cm long; ovary ovate, sessile, ca. 0.2 × 0.1 cm, smooth, glabrous, style ca. 1.8 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. *Capsule* linear, 22.9–23.5 × 2.2–2.5 cm, woody, flattened, 2-parted, base cuneate, apex attenuate, glabrous, without lenticels, with eight wings, without a longitudinal ridge, margin irregular, calyx persistent; seeds elliptic, 2.6–3.1 × 0.8–1.0 cm, wings membranaceous.

Selected Material: Afrânio, 22.IV.1971, fr., *E.P. Heringer et al.* (RB 171809).

Additional Examined Material: BRAZIL. BAHIA: Santana, 19.V.1984, fr., *M.M. Santos 81* (IPA). RIO DE JANEIRO: Paraty, Praia das Almas, 13.VI.1994, fr., *L.C. Giordano et al. 1654* (RB). MINAS GERAIS: Rio Doce, Fazenda de Santa Adelaide, 7.XII.1943, fl., *J.G. Kuhlmann 6633* (RB).

Cuspidaria octoptera is endemic to Brazil, where it occurs in Caatinga, Cerrado, and Atlantic forest vegetation from Pernambuco to São Paulo (Lohmann 2010). In Pernambuco, it was found growing in Caatinga vegetation exclusively. *Cuspidaria octoptera* can be recognized by the 2-foliolate leaves, and the 8-winged-fruit (Fig. 4j). Only one fruiting specimen from Pernambuco was

found at RB. The description of the inflorescences and flowers were based on additional examined material. Collected with fruits in April.

6.4. *Cuspidaria simplicifolia* DC., Biblioth. Universelle Genève, 17: 125, 1838. Fig. 4k-l

Liana; branchlets cylindrical, striated, with lenticels, velutinous; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 1-foliolate, without tendrils; petiole 0.5–0.7 cm long, velutinous; petiolules absent; leaflets chartaceous, 1.8–3.8 × 0.8–2.1 cm, ovate to elliptic, base cuneate to rounded, apex obtuse to acuminate, margin entire, not revolute, discolor, velutinous, venation brochidodromous. Inflorescence a compound thyrse, terminal; bracts and bracteoles 0.2–0.3 cm long, lanceolate. Calyx cupular, membranaceous, 0.1–0.2 × 0.2–0.3 cm, 5-dentate, lilac, not spongy, densely velutinous; corolla infundibuliform, membranaceous, 1.3–2.4 × 0.4–0.7 cm, lilac, velutinous; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.2–1.8 cm long, ventral filaments 0.6–1.3 cm long, staminode ca. 0.3 cm long; ovary ovate, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 1.9 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Fruits and seeds not seen.

Examined Material: Petrolina, 22.I.1970, fl., *J.P.P Carauta 989* (MO).

Cuspidaria simplicifolia is endemic to Brazil, where it occurs in Caatinga, Cerrado, and Atlantic forest vegetation from Maranhão to São Paulo (Lohmann 2010). In Pernambuco, it was found growing in Caatinga vegetation exclusively. *Cuspidaria simplicifolia* can be recognized by the leaves 1-foliolate (Fig. 4k) and the calyx 5-dentate with lobes acuminate and mucronate (Fig. 4l). A single specimens of *C. simplicifolia* was found at MO. Collected with flowers in January.

7. *Dolichandra* Cham., Linnaea 7: 657. 1832 [1833].

Lianas; branchlets cylindrical, inodorous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, tips without adhesive disks, uncinated; petiole and petiolules articulated. Inflorescence a thyrse, axillary. Calyx wide-cupular or spathaceous, membranaceous, without cupular glands, not spongy; corolla infundibuliform, yellow, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth; disk annular. Capsule linear or oblong, not stipitate, flattened or inflated, coriaceous, 2–4 parted, glabrous, calyx persistent; seeds winged, wings hyaline.

Dolichandra includes 10 species distributed through dry to wet forests from the southeastern U.S.A., Mexico and Antilles to Argentina (Lohmann & Taylor 2014). In Brazil, nine species occur, one of which is endemic (Lohmann 2010). Two species are found in Pernambuco, *D. quadrivalvis* and *D. unguis-cati.*

Key for the identification of species of *Dolichandra* from Pernambuco

1. Calyx spathaceous, 1 apiculate; fruit oblong, 4-parted.....7.1. *Dolichandra quadrivalvis*
1'. Calyx wide-cupular, truncate with undulate apex; fruit linear, 2-parted.....
.....7.2. *Dolichandra unguis-cati*

7.1. *Dolichandra quadrivalvis* (Jacq.) L.G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela, 273, 2008. Fig. 4m-n

Liana; branchlets cylindrical, striated, with lenticels, glabrous to pubescent, with simple trichomes; prophylls of the axillary buds lanceolate, not foliaceous, ca. 0.3 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, uncinated; petiole 1.5–3.9 cm long, pubescent, with simple trichomes; petiolules 1.2–2.2 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.2–9.7 × 1.4–8.3 cm, elliptic, oblong-elliptic or ovate, base cuneate to rounded, apex attenuate to rounded, margin entire, not revolute, discolor, glabrous to lepidote, venation brochidodromous. Inflorescence a thyrse, axillary; bracts and bracteoles ca. 1.3 cm long, lanceolate. Calyx spathaceous, membranaceous, 0.8–3.7 × 0.5–1.1 cm, 1-apiculated, green, not spongy, pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, 3.5–7.7 × 0.5–1.3 cm, yellow, externally glabrous; stamens inserted, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.9–2.1 cm long, ventral filaments 0.8–1.3 cm long, staminode ca. 0.4 cm long; ovary elliptic, sessile, ca. 0.4 × 0.2 cm, smooth, glabrous,

style 3.1 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Capsule oblong, 10.7–19.4 × 2.3–7.4 cm, woody, inflated, 4-parted, base cuneate, apex obtuse, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds oblong, 2.3–5.3 × 1.4–2.5 cm, wings membranaceous.

Selected Material: Manari, povoado Imburanas, 08º56'22"S, 37º38'21"W, 578 m, 22.VIII.2012, fr., *A.C.P. Oliveira 1486* (HVASF). Carnaubeira da Penha, povoado de Carqueja, 08º20'42"S, 38º39'19"W, 425 m, 17.I.2013, fl., *N.M. Almeida 491* (HVASF).

Dolichandra quadrivalvis is broadly distributed through dry to wet forests from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and phytogeographic domains (Lohmann 2010; Fonseca *et al.* 2017). *Dolichandra quadrivalvis* is morphologically close to *D. unguis-cati* and can be distinguished by the calyx spathaceous and apiculated (Fig. 4m) (*vs.* calyx wide-cupular, and truncate with undulate apex in *D. unguis-cati*; Fig. 5a), and by the 4-parted oblong fruit (Fig. 4n) (*vs.* 2-parted linear fruit linear of *D. unguis-cati*; Fig. 5b). Collected with flowers from October to March, and fruits from July to August.

7.2. *Dolichandra unguis-cati* (L.) L.G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela, 273, 2008.

Fig. 5a-b

Liana; branchlets cylindrical, striated, with lenticels, glabrous to pubescent, with simple trichomes; prophylls of the axillary buds ovate, not foliaceous, ca. 0.3 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, uncinated; petiole 1.6–5.5 cm long, pubescent, with simple trichomes; petiolules 0.3–2.3 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.5–9.4 × 1.4–7.2 cm, elliptic to ovate, base obtuse to truncate, apex attenuate to acuminate, margin entire to serrate, not revolute, discolor, adaxial surface lepidote, abaxial surface pubescent over the main veins, with simple trichomes, venation brochidodromous. Inflorescence a thyrse, axillary; bracts and bracteoles absent. Calyx wide-cupular, membranaceous, 0.5–2.1 × 0.5 × 1.7 cm, truncate with undulate margins, green, not spongy, glabrous; corolla infundibuliform, membranaceous, 2.6–8.9 × 0.7–1.5 cm, yellow, glabrous; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.8–2.1 cm long, ventral filaments 1.1–1.5 cm long, staminode ca. 0.4 cm long; ovary linear, sessile, ca. 0.4 × 0.2 cm, smooth, glabrous, style ca. 2.4 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Capsule linear, 28.3–38.5 × 0.7–1.0 cm, coriaceous, flattened, 2-parted, base and apex attenuate, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds oblong, 1.6–2.2 × 0.3–0.8 cm, wings membranaceous.

Selected Material: Ibimirim, Serra Negra, 08º39'19"S, 38º01'02"W, 20.VIII.2008, fr., *A. Alves 56* (IPA). Triunfo, Pico do Papagaio, 07º49'26"S, 38º03'15"W, 1,200 m, 5.VI.2015, fl., *D.S. Lucena et al. 653* (UFP).

Dolichandra unguis-cati is the most collected species of Bignonieae (Lohmann & Taylor 2014). This species occurs in dry to humid lowland forests from Southeastern United States to Argentina. In Brazil, it is found in all states and phytogeographical domains (Lohmann 2010; Fonseca *et al.* 2017). In Pernambuco, it was found growing in both Caatinga and Atlantic forest vegetation. *Dolichandra unguis-cati* can be recognized by the leaves with margins entire to serrate, calyx wide-cupular, truncate with undulate apex (Fig. 5a), and by the 2-parted linear fruit (Fig. 5b). The differences between *D. unguis-cati* and *D. quadrivalvis* are discussed under *D. quadrivalvis*. Collected with flowers in June and December, and fruits from July to August and December.

8. *Fridericia* Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13(2): 7. 1827.

Lianas; branchlets cylindrical, inodorous, prophylls of axillary buds triangular, not foliaceous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a compound thyrse or a dicasial cyme; axillary or terminal. Calyx cupular or tubular, membranaceous or coriaceous, without cupular glands, not spongy; corolla tubular, infundibuliform or campanulate, white, orange, pink, or lilac, membranaceous; stamens included or excluded, staminode shorter than fertile stamens, anthers glabrous, ovary sessile, smooth, lepidote; disk annular. Capsule linear, not stipitate, flattened, coriaceous, 2-parted, with or without lenticels, calyx caducous; seeds winged, wings hyaline.

Fridericia includes 67 species distributed through dry to wet forests, Cerrado, and Caatinga from Mexico to Argentina and Brazil (Lohmann & Taylor 2014). In Brazil, 59 species occur, 26 of which are endemic (Lohmann 2010; Kaehler *et al.* 2019). Ten species are found in Pernambuco, *F. chica*, *F. cuneifolia*, *F. conjugata*, *F. dichotoma*, *F. dispar*, *F. erubescens*, *F. limae*, *F. parviflora*, *F. pubescens,* and *F. triplinervia.*

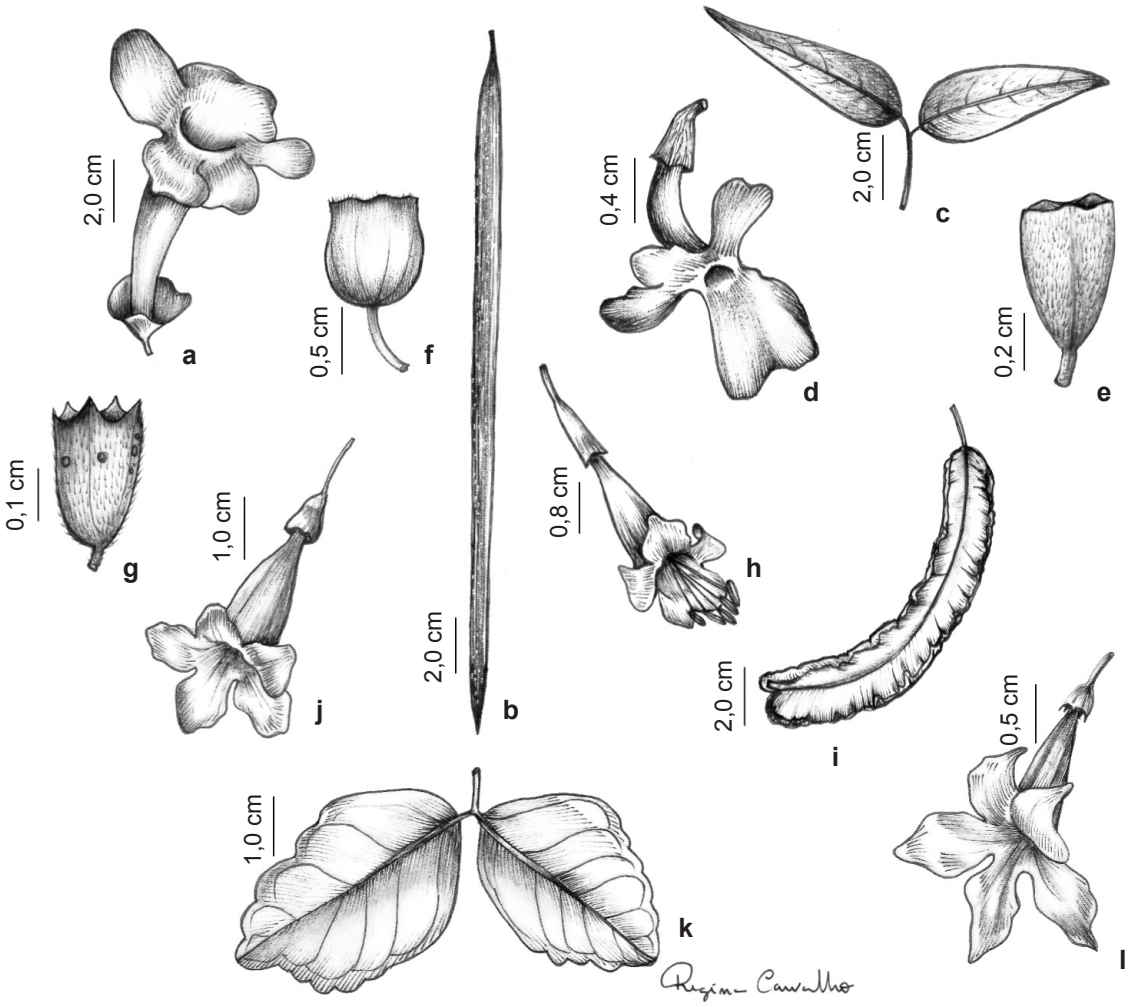

Figure 5 – a-b. *Dolichandra unguis-cati* – a. flower; b. fruit. c-e. *Fridericia chica* – c. leaf; d. flower; e. calyx. f. *Fridericia cuneifolia* – calyx. g. *Fridericia dispar* – calyx. h-i. *Fridericia erubescens* – h. flower; i. fruit. j. *Fridericia limae* – flower. k-l. *Tanaecium parviflorum* – k. leaves; l. flower.

Key for the identification of species of *Fridericia* from Pernambuco

1. Corolla tubular or campanulate 2
   2. Leaves chartaceous, concolor; calyx wide–cupular, truncate ..... 8.3. *Fridericia cuneifolia*
   2'. Leaves coriaceous, discolor; calyx tubular, truncate to 2–3-lobed ..... 8.5. *Fridericia erubescens*

1'. Corolla infundibuliform 3
   3. White flowers 4
      4. Leaflets discolor; calyx cupular and truncate ..... 8.6. *Fridericia limae*
      4'. Leaflets concolor; calyx tubular and minutely 5-apiculated ..... 8.8. *Fridericia triplinervia*
   3'. Pink or lilac flowers 5
      5. Branchlets densely velutinous ..... 8.7. *Fridericia pubescens*
      5'. Branchlets glabrous 6
         6. Leaflets glabrous ..... 8.2. *Fridericia conjugata*
         6'. Leaflets tomentose or velutinous 7
            7. Leaflets chartaceous, covered by simple trichomes; calyx truncate to minutely 5-apiculated ..... 8.1. *Fridericia chica*
            7'. Leaflets coriaceous, covered by dendritic trichomes; calyx 5-dentate ..... 8.4. *Fridericia dispar*

8.1. *Fridericia chica* (Bonpl.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 434, 2014. Fig. 5c-e

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 6.8–8.9 cm long, pubescent, with simple trichomes; petiolules 0.7–1.6 cm long, pubescent, with simple trichomes; leaflets chartaceous, 3.3–9.2 × 1.5–3.5 cm, elliptic to narrow-elliptic, base rounded, apex attenuate, margin entire, not revolute, strongly discolor, adaxial surface glabrous to sparsely velutinous, with simple trichomes, abaxial surface densely velutinous, with simple trichomes, venation actinodromous. Inflorescence a thyrse, terminal; bracts and bracteoles ca. 0.1 cm long, lanceolate. Calyx cupular, membranaceous, 0.3–0.6 × 0.3–0.4 cm, truncate to minutely 5-apiculated, pink, not spongy, densely velutinous, with simple trichomes; corolla infundibuliform, membranaceous, 1.6–2.3 × 0.5–0.7 cm, pink, pubescent, with simple trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 1.2–1.4 cm long, ventral filaments 1.1–1.3 cm long, staminode ca. 0.2 cm long; ovary elliptic, sessile, ca. 0.2 × 0.1 cm, smooth, glabrous, style ca. 1.5 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Capsule linear, ca. 22.9 × 33.1 cm, coriaceous, flattened, 2-parted, base and apex cuneate, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 1.2–1.9 × 0.4–0.6 cm, wings membranaceous.

Selected Material: Olinda, 3.IX.1998, fl., *C.A. Santana* (IPA 65286). Araripina, Chapada do Araripe, 6.V.1998, fl. and fr., *L.W. Lima-Verde et al*. (EAC 26785).

Fridericia chica is broadly distributed through wet to seasonal, lowland to montane forest vegetation from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and phytogeographical domains (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, it was found growing in Caatinga and Atlantic forest vegetation. *Fridericia chica* can be distinguished from the other species of *Fridericia* that occur in Pernambuco by the leaflets elliptic to narrow-elliptic (Fig. 5c), strongly discolor, becoming reddish to pink when dried. Collected with flowers from January to May and from September to December, and fruits in January, May, and November.

8.2. *Fridericia conjugata* (Vell.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 435, 2014. Fig. 7i

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds triangular, not foliaceous, ca. 0.1 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 3.2–4.4 cm long, glabrous; petiolules 0.9–2.0 cm long, glabrous; leaflets chartaceous, 5.7–8.8 × 3.9–5.8 cm, ovate to elliptic, base rounded to truncate, apex cuneate to acuminate, margin entire, not revolute, discolor, glabrous, venation actinodromous. Inflorescence a thyrse, terminal; bracts and bracteoles 0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.3–0.5 × 0.2–0.4 cm, truncate to minutely 5-apiculated, lilac, not spongy, velutinous, with simple trichomes; corolla infundibuliform, membranaceous, 1.0–2.5 × 0.3–0.5 cm, lilac to purple, velutinous, with simple trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 1.3–1.5 cm long, ventral filaments 0.9–1.2 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.2 × 0.1 cm, smooth, glabrous, style ca. 1.5 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Capsule linear, 17.8–26.9 × 0.8–1.4 cm, coriaceous, flattened, 2-parted, base obtuse, apex attenuate, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Maraial, Engenho Curtume, 08º48’23”S, 35º50’35”W, 261 m, 23.XII.2007, fl., *M. Sobral-Leite 611* (IPA). Caruaru, Serra da Quitéria, 08º23’43”S, 35º59’33”W, 540 m, 11.IX.2009, fl. and fr., *M. Sobral-Leite et al. 1026* (UFP).

Fridericia conjugata is broadly distributed through humid forest vegetation from Guatemala to Argentina (Lohmann & Taylor 2014). In Brazil, it grows in the Amazon rainforest, Cerrado, Caatinga, and swampy vegetation from the states of Amazonas to Goiás and from Pernambuco to São Paulo (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, it was found growing in Atlantic forest and Caatinga domains. *Fridericia conjugata* can be recognized by the glabrous leaves and by the long thyrse (22.5–35.0 cm long), bearing lilac to purple flowers, with a sweet smell (Fig. 7i). Collected with flowers from November to February, and fruits in September and January.

8.3. *Fridericia cuneifolia* (DC.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 436, 2014. Fig. 5f

Liana; branchlets cylindrical, striated, with lenticels, tomentose, simple trichomes; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a with simple tendril, not uncinate; petiole 0.5–1.1 cm long, densely tomentose, with simple trichomes; petiolules 0.6–0.9 cm long, densely tomentose, with simple trichomes; leaflets chartaceous, 3.9–7.7 × 1.5–4.2 cm, elliptic to obovate, base truncate to attenuate, apex cuneate to acuminate, margin entire, not revolute, concolor, adaxial surface pubescent, with simple trichomes, abaxial surface sparsely pubescent especially in main veins, with simple trichomes, venation actinodromous. Inflorescence a dicasial cyme, terminal; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx wide-cupular, coriaceous, 0.5–0.7 × 0.5–1.0 cm, truncate, light-lilac, not spongy, pubescent at the base, ciliated at the margin, with simple trichomes; corolla campanulate, membranaceous, 3.0–4.5 × 0.9–2.0 cm, lilac, velutinous on lobes, with simple trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 2.2–2.6 cm long, ventral filaments 1.8–2.3 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style 2.7 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Fruits and seeds not seen.

Selected Material: Brejão, 13.I.1966, fl., *A. Lima 66-4368* (IPA). Bonito, 10.II.1967, fl., *A. Lima 67-4945* (IPA).

Fridericia cuneifolia is endemic to Brazil, where it occurs in Caatinga vegetation from the states of Piauí, Bahia, Espirito Santo, Minas Gerais, and Rio de Janeiro (Lohmann 2010; Kaehler *et al.* 2019). The species is reported to Pernambuco for the first time, where it was collected in Caatinga. *Fridericia cuneifolia* can be recognized by the leaves 2-foliolate, the wide-cupular, inflated, and truncate calyx (Fig. 5f), and by the campanulate lilac corolla. Collected with flowers from January to April.

8.4. *Fridericia dispar* (Bureau & K. Schum.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 437, 2014. Fig. 5g

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 3.3–5.1 cm long, densely tomentose, with dendritic trichomes; petiolules 0.2–0.6 cm long, densely tomentose, with dendritic trichomes; leaflets coriaceous, 2.9–6.2 × 1.8–3.1 cm, elliptic to obovate, base truncate to cuneate, apex obtuse to cuspidate, margin entire, strongly discolor, not revolute, adaxial surface tomentose, with dendritic trichomes, abaxial surface densely tomentose, with dendritic trichomes, venation actinodromous. Inflorescence a thyrse, axillary or terminal; bracts and bracteoles 0.2–0.4 cm long, lanceolate. Calyx cupular, coriaceous, 0.3–0.6 × 0.2–0.4 cm, 5-dentate, lobes cuneate to attenuate, light pink, not spongy, velutinous, with dendritic trichomes and with discoid glands; corolla infundibuliform, membranaceous, 1.5–3.3 × 0.3–0.5 cm, pink to lilac, velutinous, with dendritic trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 1.2–1.7 cm long, ventral filaments 0.9–1.5 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.3 × 0.1 cm, smooth, glabrous, style ca. 1.6 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Capsule linear ca. 16.3 × 1.4 cm, woody, flattened, 2-parted, base rounded, apex acute, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Ipubi, Chapada do Araripe, 07º45'00"S, 40º29'17"W, 12.XII.1983, fl., *Fotius 3638* (IPA). Goiana, 6.IV.1983, fl., *A. Chiappeta et al. 28* (IPA).

Additional Examined Material: BRAZIL. CEARÁ: Mocambo, Serra Grande, 10.VIII.1985, fr., *A. Fernandes & Matos* (MO 3321436).

Fridericia dispar is endemic to Brazil, where it occurs in Caatinga and Cerrado vegetation from Piauí to Minas Gerais (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, it was found growing in Atlantic forest and Caatinga vegetation. *Fridericia dispar* can be distinguished from other species of *Fridericia* from Pernambuco by the leaves, petioles, petiolules, calyx, and corolla covered by dendritic trichomes (Fig. 5g), and by the coriaceous and strongly discolor leaves. Collected with flowers from December to April.

8.5. *Fridericia erubescens* (DC.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 439, 2014. Fig. 5h-i

Liana; branchlets cylindrical, striated, with lenticels, pubescent, with simple trichomes; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with

the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.3–2.0 cm long, pubescent, with simple and glandular trichomes; petiolules 0.4–0.5 cm long, pubescent, with simple and glandular trichomes; leaflets coriaceous, 3.5–8.0 × 2.0–4.5 cm, elliptic, base rounded, apex cuneate, margin entire, not revolute, discolor, adaxial surface sparsely pubescent, with simple trichomes, abaxial surface pubescent, with simple and dendritic trichomes, venation actinodromous. Inflorescence a dicasial cyme, terminal; bracts and bracteoles 0.1–0.2 cm long, lanceolate, pubescent, with glandular trichomes. Calyx tubular, membranaceous, 0.7–0.9 × 0.3–0.5 cm, truncate to 2–3-lobed, minutely 5-apiculated, green to purple, not spongy, pubescent, with glandular trichomes; corolla tubular, membranaceous, 3.4–4.4 × 0.5–0.8 cm, tube orange, lobes pink and internally yellow, externally pubescent, with dendritic and glandular trichomes; stamens excluded, anthers ca. 0.3 cm long, glabrous, dorsal filaments ca. 4.8 cm long, ventral filaments ca. 4.5 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 5.3 cm long, stigma ca. 0.3 cm long, elliptic; disk annular. Capsule linear, 12.1–32.5 × 3.0–3.5 cm, coriaceous, flattened, 2-parted, base acute, apex obtuse, glabrous, without lenticels, with four wings, without a longitudinal ridge, calyx persistent; seeds oblong, 1.2 × 1.0 cm, wings membranaceous.

Selected Material: Araripina, 10.II.1998, fr., *C. Ferreira* (IPA 61970). Afrânio, povoado de Caboclo, 08º29'27"S, 40º56'1"W, 697 m, 25.XI.2007, fl., *M.F. Silva et al. 11* (HVASF).

Fridericia erubescens is endemic to Brazil, where it occurs in humid forests, Caatinga, and Cerrado vegetation from Piauí to Rio de Janeiro (Lohmann 2010; Kaehler *et al*. 2019). In Pernambuco, it was found growing in Caatinga vegetation. *Fridericia erubescens* can be distinguished from other *Fridericia* from Pernambuco by the orange corolla with pink lobes, the with exserted stamens (Fig. 5h), and linear fruit, with four wings (Fig. 5i). Collected with flowers and fruits from September to February.

8.6. *Fridericia limae* (A.H. Gentry) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 440, 2014.

Fig. 5j

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds triangular, not foliaceous, ca. 0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.5–2.9 cm long, glabrous; petiolules 0.4–1.6 cm long, glabrous; leaflets membranaceous, 1.1–7.2 × 0.6–3.6 cm, elliptic, base rounded, apex rounded to emarginate, margin entire, discolor, not revolute, glabrous, venation actinodromous. Inflorescence a dicasial cyme, terminal; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.8–0.9 × 0.7–1.0 cm, truncate, green, not spongy, pubescent only in the lobes margin, simple trichomes; corolla infundibuliform, membranaceous, ca. 5.0 × 1.9 cm, white, densely tomentose, with simple and glandular trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 2.2–2.5 cm long, ventral filaments 2.1–2.3 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.3 × 0.2 cm, smooth, glabrous, style ca. 2.6 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Capsule linear, 19.7–24.5 × 1.6–1.8 cm, coriaceous, flattened, 2-parted, base and apex acute, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Buique, Fazenda Laranjeiras, 08º37'00"S, 37º'10'00"W, 790 m, 20.V.1995, fr., *A. Laurênio et al. 63* (PEUFR). Ibimirim, 08º32'52"S, 37º42'37"W, 487 m, 8.XI.2012, fl., *A.C.P. Oliveira et al. 1857* (HVASF).

Fridericia limae is endemic to Northeastern Brazil, where it is found in Caatinga vegetation in almost all states (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, it was found growing in Caatinga vegetation. *Fridericia limae* can be recognized by the calyx truncate, glabrous in the tube but pubescent in the margins, and white corolla (Fig. 5j). Collected with flowers from November to February, and fruits from April to May.

8.7. *Fridericia pubescens* (L.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 443–444, 2014.

Liana; branchlets cylindrical, striated, with lenticels, velutinous, with simple trichomes; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.9–2.1 cm long, densely velutinous, with simple trichomes; petiolules 1.1–1.5 cm long, densely velutinous, with simple trichomes; leaflets coriaceous, 5.4–8.6 × 2.6–4.4 cm, elliptic to ovate, base truncate to subcordate, apex cuneate to acuminate, margin entire, not revolute, discolor, adaxial surface pubescent, with simple and glandular trichomes, abaxial surface densely

velutinous, with simple and glandular trichomes, venation actinodromous. Inflorescence a thyrse, terminal; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.3–0.5 × 0.2–0.3 cm, truncate to minutely 5-apiculated, purple, velutinous, with simple trichomes; corolla infundibuliform, membranaceous, 1.3–1.9 × 0.5–0.9 cm, light pink to lilac, not spongy, velutinous, with simple trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 0.8–1.0 cm long, ventral filaments 0.6–0.8 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.2 × 0.1 cm, smooth, glabrous, style ca. 1.2 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Fruits and seeds not seen.

Examined Material: Serrolândia, Chapada do Araripe, 12.XII.1983, fl., *Fotius 3639* (IPA).

Fridericia pubescens is broadly distributed through dry to humid forest vegetation from Mexico to Paraguay (Lohmann & Taylor 2014). In Brazil, it is found in almost all states (except in Santa Catarina and Rio Grande do Sul) and phytogeographical domains (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, a single specimen was collected in the municipality of Serrolândia, growing in Caatinga vegetation. *Fridericia pubescens* can be recognized by the branchlets, petioles, petiolules, leaves, calyx, and corolla densely velutinous, the leaves strongly discolor, grey calyx, and dark pink corollas. Collected with flowers in December.

8.8. *Fridericia triplinervia* (Mart. *ex* DC.) L.G. Lohmann, Ann. Missouri Bot. Gard., 99(3): 446, 2014. Fig. 6a

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.3–1.8 cm long, sparsely pubescent, with simple trichomes; petiolules 1.6–1.9 cm long, sparsely pubescent, with simple trichomes; leaflets coriaceous, 4.1–6.5 × 1.0–3.6 cm, elliptic, base truncate to rounded, apex attenuate to acuminate, margin entire, not revolute, concolor, glabrous, venation actinodromous. Inflorescence a dicasial cyme, axillary or terminal; bracts and bracteoles ca. 0.3 cm long, lanceolate. Calyx tubular, coriaceous, 0.8–1.5 × 0.3–0.5 cm, minutely 5-apiculated, brown to yellow, not spongy, densely lepidote and sparsely pubescent, with simple trichomes; corolla infundibuliform, membranaceous, 3.5–6.0 × 0.8–1.5 cm, white, externally velutinous, with simple trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 2.6–2.9 cm long, ventral filaments 2.3–2.7 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.3 × 0.1 cm, smooth, glabrous, style ca. 3.3 cm long, stigma ca. 0.3 cm long, elliptic; disk annular. Capsule linear, 31.3 × 1.9 cm, woody, flattened, 2-parted, base acute, apex obtuse, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Ipubi, Serra Branca, 6.V.1971, fl., *E.P. Heringer et al. 584* (RB). São Vicente Férrer, Mata do Estado, 07º35'00"S, 35º30'00"W, 600 m, 12.II.1999, fl., *M. Oliveira & E.M.N. Ferraz 412* (PEUFR).

Additional Examined Material: BRAZIL. BAHIA: Ilhéus, 10.VIII.1994, fr., *A.M.V. Carvalho et al. 4577* (MO).

Fridericia triplinervia is distributed through dry to humid forest vegetation from Bolivia, Paraguay, and Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in almost all states and phytogeographical domains (Lohmann 2010; Kaehler *et al.* 2019). In Pernambuco, it was found growing in both Caatinga and Atlantic forest vegetation. *Fridericia triplinervia* can be recognized by the leaflets with actinodromous venation, and the tubular calyx, brown to yellow (Fig. 6a). Collected with flowers from February to September.

9. *Lundia* DC., Biblioth. Universelle Genève, sér. 2. 17: 127. 1838.

Lundia includes 13 species distributed through dry to wet forests from southern Mexico to Brazil (Lohmann & Taylor 2014). In Pernambuco, only *Lundia longa* is found.

9.1. *Lundia longa* (Vell.) DC., Prodr., 9:180, 1845. Fig. 7k-l

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of axillary buds triangular, not foliaceous, ca. 0.1 cm, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.6–2.3 cm long, pubescent, with simple trichomes; petiolules 0.4–1.4 cm long, pubescent, with simple trichomes; leaflets chartaceous, 3.8–7.7 × 1.4–6.8 cm, ovate, base cordate, apex acuminate, margin entire, not revolute, discolor, pubescent, velutinous in the axil of main veins, with simple trichomes, venation brochidodromous.

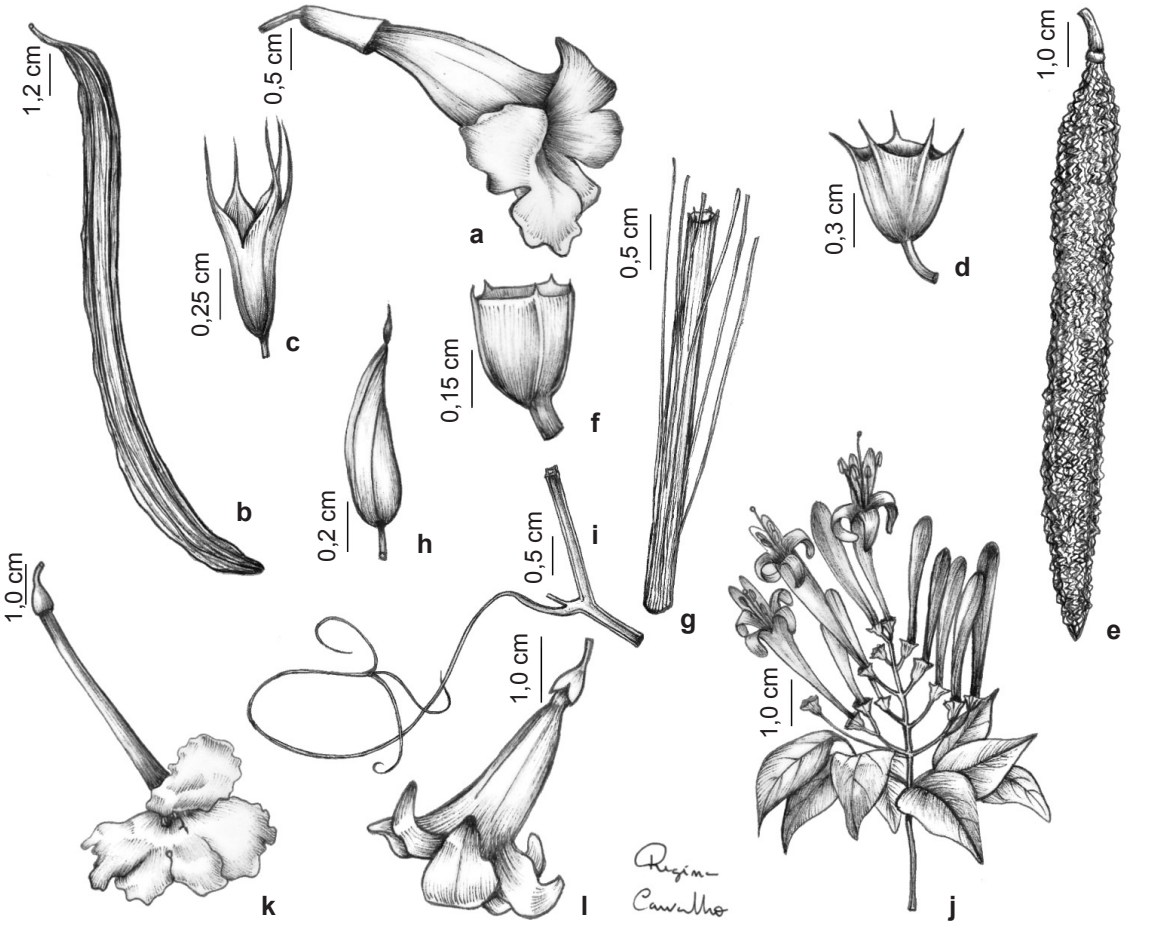

Figure 6 – a. *Fridericia triplinervia* – flower. b. *Mansoa difficilis* – fruit. c. *Mansoa hirsuta* – calyx. d-e. *Mansoa onohualcoides* – d. calyx; e. fruit. f-g. *Mansoa paganuccii* – f. calyx; g. branchlets with detachable ridge. h. *Adenocalymma candolleanum* – calyx. i. *Pleonotoma stichadenia* – branchlets. j. *Pyrostegia venusta* – inflorescence. k. *Tanaecium cyrtanthum* – flower. l. *Tanaecium pyramidatum* – flower.

Inflorescence corymbose, terminal; bracts and bracteoles 0.1 cm long, lanceolate. Calyx tubular, coriaceous, 0.4–0.6 × 0.2–0.3 cm, truncate to bilabiate, green at base and pink at apex, not spongy, pubescent, with simple trichomes; corolla hipocrateriform, membranaceous, 3.1–7.2 × 0.3–0.5 cm, dark pink to reddish, internally yellow, externally villose, with simple trichomes; stamens exserted, anthers ca. 0.3 cm long, densely villose, simple trichomes, dorsal filaments 3.3–4.7 cm long, ventral filaments 3.2–4.1 cm long, staminode shorter than fertile stamens, ca. 0.5 cm long; ovary elliptic, sessile, 0.4 × 0.1 cm, smooth, densely villose, with simple trichomes, style 3.6–4.8 cm long, stigma ca. 0.3 cm long, rhombic, densely villose, with simple trichomes; nectar disk absent. Capsule linear, 10.6–19.4 × 1.6–1.9 cm, coriaceous, flattened, 2-parted, base cuneate, apex attenuate, pubescent, without lenticels, without wings, without a longitudinal ridge, with simple trichomes, margin entire, calyx caducous; seeds elliptic, 3.4 × 0.5 cm, wings membranaceous.

Selected Material: Igarassu, Usina São José, Mata dos Macacos, 07º50'20"S, 35º00'10"W, 30 m, 15.VIII.2002, fr., *A. Melquiades & D.S. Silva 9* (PEUFR). Bezerros, Parque Ecológico de Serra Negra, 08º12'00"S, 35º49'00"W, 471 m, 5.X.1995, fl., *M.F.A. Lucena et al. 11* (PEUFR).

Lundia longa is endemic to Brazil, where it occurs in the Atlantic forest, Caatinga, and Cerrado vegetation from Ceará to São Paulo (Lohmann 2010). In Pernambuco, it was found growing in both Caatinga and Atlantic forest domains. *Lundia longa* can be recognized by

the long-tubular (3.1–7.2 cm long) and showy dark pink to reddish corollas (Fig. 7l), and by the anthers, ovary, and stigma densely villose. Collected with flowers from August to December, and fruits from August to November.

10. ***Mansoa*** DC., Biblioth. Universelle Genève, sér. 2, 17: 128. 1838.

Lianas; branchlets cylindrical, with garlic smell. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a thyrse, axillary. Calyx cupular, membranaceous, without cupular glands, not spongy; corolla infundibuliform, white, purple, or lilac, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth, glabrous; disk annular. Capsule linear, not stipitate, flattened, coriaceous, 2-parted, without lenticels, calyx caducous; seeds winged, wings hyaline.

Mansoa includes 18 species distributed through dry to wet forests from Mexico and the Antilles to Argentina and Brazil (Lohmann & Taylor 2014). In Brazil, 15 species occur, nine of which are endemic (Lohmann 2010). Four species are found in Pernambuco, *M. difficilis*, *M. hirsuta*, *M. onohualcoides*, and *M. paganuccii.*

Key for the identification of species of *Mansoa* from Pernambuco

1. Leaflets concolor; prophylls of the axillary buds triangular and minute 2
   2. Inflorescence axillary; corolla tube purple to lilac throughout ..... 10.1. *Mansoa difficilis*
   2’. Inflorescence terminal; corolla tube lilac, base white ..... 10.3. *Mansoa onohualcoides*

1’. Leaflets discolor; prophylls of the axillary buds obovate or lacking 3
   3. Branchlets ridges detachable; leaflets with margins dentate to irregulary entire .... 10.4. *Mansoa paganuccii*
   3’. Branchlets ridges not detachable; leaflets with margins entire ..... 10.2. *Mansoa hirsuta*

10.1. ***Mansoa difficilis*** (Cham.) Bureau & K. Schumann, *Fl. bras.*, 8(2): 201, 1896. Fig. 6b

Liana; branchlets cylindrical, striated, branchlets ridges not detachable, without lenticels, pubescent, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, 0.1–0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.1–3.0 cm long, pubescent, with simple trichomes; petiolules 0.9–1.4 cm long, pubescent, with simple trichomes; leaflets chartaceous, 5.2–10.3 × 1.6–4.8 cm, elliptic, base cordate to attenuate, apex acuminate, margin entire, no revolute, concolor, pubescent, with glandular trichomes, venation actinodromous. Inflorescence a thyrse, axillary; bracts and bracteoles 0.1–0.2 cm long, lanceolate. Calyx cupular, membranaceous, 0.5–1.2 × 0.3–0.9 cm, truncate to 5-dentate, green, not spongy, lepidote and pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, 3.6–6.2 × 2.4–5.2 cm, purple to lilac, externally pubescent, with simple trichomes; stamens included, anthers ca. 0.4 cm long, glabrous, dorsal filaments 2.0–2.6 cm long, ventral filaments 1.3–1.9 cm long, staminode ca. 0.5 cm long; ovary elliptic, sessile, ca. 0.4 × 0.1 cm, smooth, glabrous, style 2.3–3.7 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, 19.5–30.2 × 1.0–1.5 cm, coriaceous, flattened, base cuneate, apex acuminate, glabrous, without lenticels, without wings, without a longitudinal ridge, longitudinally striated, margin irregular, calyx persistent; seeds elliptic, 1.3–2.0 × 3.3–4.0 cm, wings membranaceous.

Selected Material: Mirandiba, 08º05’00”S, 38º48’00”W, 500 m, 11.III.2008, fl., *K. Pinheiro et al. 341* (UFP). Jaqueira, Serra do Urubu, 31.X.2015, fl., *L. Nusbaumer 4721* (JPB).

Additional Examined Material: BRAZIL. BAHIA: Nova Viçosa, 6.IX.1989, fr., *A.M. Carvalho et al. 2488* (MO).

Mansoa difficilis is frequently found in humid forest vegetation in Bolivia, Paraguay, Brazil, and Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in almost all states and phytogeographical domains, except from some northern and midwestern states (Lohmann 2010). In Pernambuco, it was found growing in Caatinga and Atlantic forest vegetation. *Mansoa difficilis* can be recognized by the axillary inflorescences, the truncate to 5-dentate calyx with cuneate lobes,

and the capsule longitudinally striated (Fig. 6b). *Mansoa difficilis* is morphologically similar to *M. paganuccii*; the similarities and differences among those species are discussed under *M. paganuccii*. Collected with flowers in March and October.

10.2. *Mansoa hirsuta* DC., Prodr., 9: 182, 1845. Fig. 6c

Liana; branchlets cylindrical, striated, branchlets ridges not detachable, with lenticels, pubescent, with simple trichomes; prophylls of the axillary buds absent. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.1–2.9 cm long, pubescent, with simple trichomes; petiolules 0.2–1.3 cm long, pubescent, with simple trichomes; leaflets chartaceous, 5.5–16.2 × 2.4–8.2 cm, ovate to elliptic, base subcordate, apex acute to rounded, margin entire, discolor, not revolute, adaxial surface pubescent, with simple trichomes, abaxial surface pubescent, with simple and glandular trichomes; venation actinodromous. Inflorescence a thyrse, axillary; bracts and bracteoles 0.1–0.2 cm long, lanceolate. Calyx cupular, membranaceous, 1.1–2.5 × 0.8–1.3 cm, 2–3 lobed, green to purple, not spongy, pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, 6.5–8.0 × 3.3–6.5 cm, purple externally, yellow internally, glabrous, pubescent on lobes, with glandular trichomes; stamens included, anthers ca. 0.5 cm long, glabrous, dorsal filaments 1.3–2.2 cm long, ventral filaments 1.0–1.3 cm long, staminode ca. 0.5 cm long; ovary elliptic, sessile, ca. 0.2 × 0.2 cm, smooth, glabrous, style ca. 3.5 cm long, stigma ca. 0.4 cm long, rhombic; disk annular. Capsule linear, 10.2–18.0 × 1.1–2.5 cm, coriaceous, flattened, base cuneate, apex acute, pubescent, without lenticels, without wings, without a longitudinal ridge, with simple and glandular trichomes, margin irregular, calyx persistent*;* seeds elliptic, 1.8–2.5 × 3.0–4.1 cm, wings membranaceous.

Selected Material: Araripina, 17.IX.1996, fl. and fr., *C. Ferreira & P. Escarião 6* (IPA); 7.VIII.1986, fl. and fr., *V.C. Lima 358* (IPA).

Mansoa hirsuta is endemic to northeastern Brazil, where it occurs in all states, growing in Caatinga and Cerrado vegetation (Lohmann 2010). In Pernambuco, it was found growing in Caatinga vegetation. *Mansoa hirsuta* can be recognized by the 2–3-lobed calyx, with prominent veins (1.0–1.5 cm long) (Fig. 6c), and by the purple corolla, yellow internally. Collected with flowers and fruits from July to December.

10.3. *Mansoa onohualcoides* A.H. Gentry, Ann. Missouri Bot. Gard., 63: 63, 1976. Fig. 6d-e

Liana; branchlets cylindrical, striated, branchlets ridges not detachable, with lenticels, pubescent, with simple trichomes; prophylls of the axillary buds triangular, not foliaceous, 0.1–0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 0.9–3.8 cm long, pubescent, with simple trichomes; petiolules 0.4–3.8 cm long, glabrous to pubescent, with simple trichomes; leaflets chartaceous, 5.0–13.0 × 2.2–5.6 cm, elliptic, base cuneate, apex acuminate to acute, margin entire, not revolute, concolor, adaxial surface glabrous, abaxial surface pubescent, with glandular trichomes, venation actinodromous. Inflorescence a thyrse, terminal; bracts and bracteoles absent. Calyx cupular, membranaceous, 0.7–0.9 × 0.9–1.3 cm, 5-dentate, green, not spongy, pubescent, with simple trichomes; corolla infundibuliform, membranaceous, 3.5–4.5 × 1.8–2.4 cm, lilac, white at the base, externally glabrous; stamens included, anthers ca. 0.4 cm long, glabrous, dorsal filaments 1.6–2.1 cm long, ventral filaments 1.2–1.3 cm long, staminode ca. 0.5 cm long; ovary elliptic, sessile, ca. 0.4 × 0.1 cm, smooth, glabrous, style ca. 2.0 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, 13.9–20.0 × 1.1–2.0 cm, coriaceous, flattened, 2-parted, base attenuate, apex acute, verrucose, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 0.9–1.0 × 3.0–3.8 cm, wings membranaceous.

Selected Material: Brejo da Madre de Deus, Brejo de São José, 7.IV.1960, fr., *A. Lima 60-3525* (RB). Ibimirim, 11.XII.1995, fl., *A.P.S. Gomes et al. 224* (PEUFR).

Mansoa onohualcoides is endemic to Brazil, where it occurs in Atlantic forest vegetation from the states of Maranhão, Ceará, Paraiba, Pernambuco, and disjunctly in Espírito Santo (Lohmann 2010). In Pernambuco, it was found growing in "brejo de altitude" vegetation. *Mansoa onohualcoides* can be recognized by the calyx 5-dentate with lobes prominent (ca. 0.2 cm long) (Fig. 6d), corolla lilac, white at base, and verrucose capsule (Fig. 6e). Collected with flowers in December, and fruits in April.

10.4. *Mansoa paganuccii* Silva-Castro, Phytotaxa, 258(1): 049–062, 2016. Fig. 6f-g

Liana; branchlets cylindrical, striated, branchlets ridges detachable, without lenticels,

glabrous; prophylls of the axillary buds obovate, not foliaceous, ca. 0.2 cm long, pubescent, with simple trichomes. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 1.2–1.6 cm long, pubescent, with simple trichomes; petiolules 0.4–1.5 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.1–5.1 × 1.9–2.2 cm, elliptic, base cuneate, apex acute to rounded, margin dentate to irregulary entire, not revolute, discolor, adaxial surface pubescent, with simple trichomes, abaxial surface lepidote and pubescent, with glandular trichomes, venation actinodromous. Inflorescence a thyrse, axillary or terminal; bracts and bracteoles ca. 0.1 cm long, lanceolate. Calyx cupular, membranaceous, 0.3–0.5 × 0.3–0.4 cm, truncate to 5-apiculated, green to purple, not spongy, pubescent, with simple and glandular trichomes; corolla infundibuliform, membranaceous, 3.8–6.5 × 2.2–4.1 cm, purple, externally glabrous in tube and pubescent in lobes, with glandular trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.8–2.5 cm long, ventral filaments 1.3–1.5 cm long, staminode ca. 0.2 cm long; ovary elliptic, sessile, ca. 0.2 × 0.1 cm, smooth, glabrous, style ca. 2.8 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, 11.0–18.7 × 1.0–1.3 cm, coriaceous, flattened, 2-parted, base attenuate, apex acuminate, glabrous, without lenticels, without wings, without a longitudinal ridge, margin irregular, calyx persistent; seeds elliptic, 0.9–1.6 × 3.0–3.2 cm, wings membranaceous.

Selected Material: Buíque, Vale do Catimbau, 08º35'34"S, 37º14'05"W, 811 m, 12.IX.2012, fr., *G.C. Delgado-Júnior & O. Santos 432* (UFP). Mirandiba, 08º07'80"S, 38º42'11"W, 520 m, 18.VII.2008, fl., *K. Pinheiro 1055* (UFP).

Mansoa paganuccii is endemic to Brazil, where it grows in Caatinga and Cerrado vegetation from Piauí to São Paulo (Silva-Castro & Queiroz 2016). In Pernambuco, it was found growing in Caatinga vegetation. *Mansoa paganuccii* can be recognized by the branchlets with detachable ridges (Fig. 6g), leaflets with margins dentate to irregulary entire, and calyx truncate to 5-apiculate (Fig. 6f). Most specimens of *Mansoa paganuccii* were erroneously identified as *Mansoa difficilis* due to the shared elliptic leaflets, bracts and bracteoles lanceolate, calyx without prominent lobes, and corolla lilac to purple in tube and lobes. These species can be differentiated by the branchlets with detachable ridges (*vs.* ridge not detachable in *M. difficilis*), discolor leaflets (*vs.* concolor leaflets in *M. difficilis*), and prophylls of the axillary buds obovate (*vs.* prophylls of the axillary buds triangular and minute in *M. difficilis*). Collected with flowers from June to August, and fruits from September and October.

11. *Pleonotoma* Miers, Proc. Roy. Hort. Soc. London. 3: 184. 1863.

Pleonotoma includes 17 species distributed through dry to wet forests, Caatinga, and Cerrado from northern Central America to Brazil (Lohmann & Taylor 2014). In Brazil, 14 species occur, seven of which are endemic (Lohmann 2010). A single species is found in Pernambuco, *Pleonotoma stichadenia* K. Schum.

11.1. *Pleonotoma stichadenia* K. Schum., Nat. Pflanzenfam. 4(3b): 226, 1894. Fig. 6i

Liana; branchlets tetragonal, striated, without lenticels, glabrous; prophylls of the axillary buds linear, foliaceous, ca. 1.2 cm long, glabrous. Leaves 2-ternate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 2.1–2.8 cm long, with winged corners; petiolules 0.3–1.4 cm long; leaflets chartaceous, 3.4–8.9 × 3.1–4.8 cm, elliptic, base acute to attenuate, apex acuminate, margin entire, not revolute, discolor, glabrous, venation brochidodromous. Inflorescence a simple raceme, terminal; bracts and bracteoles absent. Calyx cupular, membranaceous, ca. 0.8 × 0.5 cm, truncate to 5-apiculated, green, not spongy, pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, ca. 7.9 × 1.1 cm, light yellow to wine, externally pubescent, with glandular trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments ca. 2.1 cm long, ventral filaments ca. 1.8 cm long, staminode ca. 0.3 cm long; ovary linear, sessile, ca. 0.3 × 0.1 cm, smooth, lepidote and pubescent, with simple trichomes, style ca. 2.3 cm long, stigma ca. 0.3 cm long, rhombic; disk annular. Fruit and seeds not seen.

Selected Material: Exu, Chapada do Araripe, 16.II.1984, fl., *Fotius 3777* (IPA). Sirinhaém, Usina Trapiche, Mata das Cobras, 17.X.2009, fl., *J.D. Garcia & E. Pessoa 1225* (UFP).

Pleonotoma stichadenia is endemic to Brazil, where it grows in Atlantic forest domain from the states of Pernambuco to Rio de Janeiro and Minas Gerais (Lohmann 2010). In Pernambuco, it was found growing in Caatinga and Atlantic forest domains. *Pleonotoma stichadenia* can be

recognized by the branchlets tetragonal (Fig. 6i) and striated, with purple and winged angles, the 2-ternate leaves, and the linear prophylls of the axillary buds. Collected with flowers in October and February.

12. *Pyrostegia* Presl, Abh. Koenigl. Bohm. Ges. Wiss., ser. 5, 3: 523. 1845.

Pyrostegia includes two species, *P. millingtonioides* Sandwith and *P. venusta* (Ker Gawl.) Miers, distributed through dry to humid vegetation from Mexico to Argentina (Lohmann & Taylor 2014). Both species occur in Brazil (Lohmann 2010). A single species is found in Pernambuco, *P. venusta*.

12.1. *Pyrostegia venusta* (Ker Gawl.) Miers, Proc. Roy. Hort. Soc. London, 3: 188, 1863. Fig. 6j; 7m

Liana; branchlets hexagonal, striated, without lenticels, glabrous; prophylls of axillary buds triangular, foliaceous, ca. 0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a trifid tendril, not uncinate; petiole 0.7–3.4 cm long, pubescent, with simple trichomes; petiolules 0.3–2.0 cm long, pubescent, with simple trichomes; leaflets chartaceous, 2.5–9.9 × 1.4–5.5 cm, ovate, base rounded, apex acute to acuminate, margin entire, not revolute, concolor, glabrous, with pellucid punctations, venation brochidodromous. Inflorescence a cyme corymbiform, terminal; bracts and bracteoles ca. 0.1 cm long, lanceolate. Calyx cupular, membranaceous, 0.4–0.5 × 0.3–0.4 cm, 5-apiculated, green, not spongy, glabrous, membranaceous; corolla hipocrateriform, membranaceous, 3.5–9.1 × 0.5–0.7 cm, orange, externally glabrous; stamens exserted, anthers ca. 0.2 cm long, glabrous, dorsal filaments 3.7–7.3 cm long, ventral filaments 3.5–7.1 cm long, staminode ca. 0.5 cm long; ovary elliptic, sessile, ca. 0.4 × 0.1 cm, smooth, lepidote, style 4.1–8.2 cm long, stigma ca. 0.2 cm long, rhombic; disk annular. Capsule linear, 12.4–34.7 × 0.8–1.2 cm, coriaceous, flattened, 2-parted, base and apex acute, glabrous, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Moreilândia, 10.XII.2000, fl. and fr., *F.S. Cavalcanti 779* (EAC). Santa Cruz da Baixa Verde, 30.VIII.2014, fl., *L. Maciel-Júnior & A. Laurênio 205b* (HESBRA).

Pyrostegia venusta is commonly found in dry to humid lowland forests from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and phytogeographical domains (Lohmann 2010). In Pernambuco, it was found growing in Caatinga and Atlantic forest domains. *Pyrostegia venusta* can be recognized by the branchlets hexagonal, trifid tendril, leaves with pellucid punctations and the showy, long (3.5–9.1 cm long), orange, and tubular corolla (Fig. 6j; 7m). Collected with flowers from August to December, and fruits in December.

13. *Tanaecium* Swartz, Prodr. Veg. Ind. Occ. 6: 91. 1788.

Lianas; branchlets cylindrical, inodorous, prophylls of the axillary buds bromeliad-like, foliaceous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple or bifid tendril, tips without adhesive disks, not uncinate; petiole and petiolules articulated. Inflorescence a simple thyrse, axillary or terminal. Calyx cupular, coriaceous, without cupular glands, not spongy; corolla hipocrateriform or infundibuliform, white, pink, or lilac, membranaceous; stamens included, staminode shorter than fertile stamens, anthers glabrous, straight; ovary sessile, smooth, lepidote; disk annular. Capsule linear, not stipitate, flattened or inflated, coriaceous, 2-parted, with lenticels, calyx caducous; seeds winged or not-winged, wings hyaline when present.

Tanaecium includes 21 species distributed through dry to wet forest vegetation from Mexico and the Antilles to Argentina (Frazão & Lohmann 2019). In Brazil, 13 species occur, two of which are endemic (Lohmann 2010; Frazão & Lohmann 2019). Five species are found in Pernambuco, *T. cyrtanthum* and *T. pyramidatum.*

Key for the identification of species of *Tanaecium* from Pernambuco

1. Leaflets with margin crenate; inflorescence a dicasial cyme ..... 13.3. *Tanaecium parviflorum*
1'. Leaflets with margin entire; inflorescence a thyrse 2
    2. Inflorescence axillary; corolla hipocrateriform ..... 13.1. *Tanaecium cyrtanthum*
    2'. Inflorescence terminal; corolla infundibuliform 3
        3. Calyx bilabiate and cuspidate ..... 13.2. *Tanaecium dichotomum*

3’. Calyx truncate, irregulary divided or 2-lobed 4
4. Tendril simple; prophylls of the axillary buds foliaceous, elliptic ..... 13.5. *Tanaecium selloi*
4’. Tendril bifid; prophylls of the axillary buds not foliaceous triangular ..... 13.4. *Tanaecium pyramidatum*

13.1. *Tanaecium cyrtanthum* (Mart. *ex* DC.) Bureau & K. Schumann, Fl. bras., 8(2): 186, 1896. Fig. 6k

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds bromeliad-like, foliaceous, ca. 0.3 cm long, glabrous. Leaves 2-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 0.5–2.1 cm long, pubescent, with simple trichomes; petiolules 0.3–0.8 cm long, pubescent, with simple trichomes; leaflets chartaceous, 1.9–3.1 × 1.1–1.9 cm, ovate, base cuneate, apex cuneate to acuminate, margin entire, not revolute, discolor, adaxial surface sparsely pubescent, with simple and bifid trichomes, abaxial surface densely pubescent, with simple and bifid trichomes, venation brochidodromous. Inflorescence a simple thyrse, axillary; bracts and bracteoles absent. Calyx cupular, coriaceous, 0.5–0.6 × 0.4–0.5 cm, 5-apiculated, green, not spongy, sparsely pubescent along the calyx and pubescent in margins, with simple trichomes; corolla hipocrateriform, membranaceous, 5.5–9.9 × 0.2–0.3 cm, white, externally densely velutinous, with simple trichomes; stamens included, anthers ca. 0.2 cm long, glabrous, dorsal filaments 5.2–8.7 cm long, ventral filaments 4.9–8.2 cm long, staminode ca. 0.5 cm long; ovary linear, sessile, ca. 0.4 × 0.1 cm, smooth, glabrous, style ca. 8.9 cm long, stigma ca. 0.2 cm long, ellipsoid; disk annular. Fruits and seeds not seen.

Selected Material: Tacaratu, 09º05’0,3”S, 38º07’25”W, 598 m, 15.I.2009, fl., *J.G. Carvalho-Sobrinho et al. 1822* (HUEFS). Afrânio, Povoado de Caboclo, 08º28’5”S, 40º54’3”W, 6.XII.2005, fl., *G.S.G. Nascimento 13* (HVASF).

Tanaecium cyrtanthum is found in dry forests, Caatinga, and Cerrado vegetation from Bolivia, Paraguay, Brazil, and Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in the coastal region from Ceará to Bahia and in Goiás, Mato Grosso do Sul and Rondônia (Lohmann 2010; Frazão & Lohmann 2019). In Pernambuco, it was found growing in Caatinga and “brejo de altitude” vegetation. *Tanaecium cyrtanthum* can be recognized by the simple tendril, calyx 5-apiculate, and the long hipocrateriform corolla (Fig. 6k). Collected with flowers from November to January.

13.2. *Tanaecium dichotomum* (Jacq.) Kaehler & L.G.Lohmann, Taxon 68: 15. 2019.

Liana; branchlets cylindrical, striated, with lenticels, velutinous, with simple trichomes; prophylls of the axillary buds bromeliad-like, foliaceous, ca. 0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 1.3–1.9 cm long, velutinous, with simple trichomes; petiolules 0.4–0.8 cm long, velutinous, with simple trichomes; leaflets membranaceous, 2.1–4.5 × 1.5–2.7 cm, oblong to elliptic, base and apex rounded, margin entire, not revolute, discolor, velutinous, with simple trichomes, venation brochidodromous. Inflorescence a simple thyrse, terminal; bracts and bracteoles ca. 0.2 cm long, lanceolate. Calyx cupular, coriaceous, 0.6–1.7 × 0.3–0.9 cm, bilabiate and cuspidate apex, lilac, not spongy, velutinous, with simple trichomes; corolla infundibuliform, membranaceous, 3.3–6.1 × 0.8–1.3 cm, pink to lilac, internally white, externally velutinous, with simple trichomes; stamens included, anthers ca. 0.3 cm long, glabrous, dorsal filaments 1.5–1.7 cm long, ventral filaments 1.1–1.4 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, ca. 0.4 × 0.2 cm, smooth, glabrous, style ca. 2.3 cm long, stigma ca. 0.3 cm long, elliptic; disk annular. Capsule linear, 17.3–28.8 × 1.2–1.7 cm, coriaceous, flattened, 2-parted, base and apex cuneate, densely velutinous, with simple trichomes, with lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds elliptic, 1.9–2.8 × 1.3–1.6 cm, wings membranaceous.

Selected Material: Ibimirim, 16.II.1996, fr., *A.P.S. Gomes & D.S. Pimentel 279* (MO). Cabrobó, barragem Riacho Grande, 08º21’51”S, 39º18’23”W, 345 m, 5.X.2010, fl., *M. Sobrinho 651* (IPA).

Tanaecium dichotomum is broadly distributed through dry to humid lowland forest vegetation from Mexico to Argentina (Lohmann & Taylor 2014). In Brazil, it occurs in all states and phytogeographical domains, except from the southern portions of the country (Lohmann 2010; Frazão & Lohmann

2019). In Pernambuco, it was found growing in Caatinga vegetation. *Tanaecium dichotomum* can be recognized by the dichotomic inflorescence, the calyx truncate to irregulary apiculate, and the green and densely velutinous fruit. Collected with flowers from October to December, and fruits in January and February.

13.3. *Tanaecium parviflorum* (Mart. *ex* DC.) Kaehler & L.G.Lohmann, Taxon 68: 15. 2019. Fig. 5k-l; 7j

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds bromeliad-like, foliaceous, ca. 0.3 cm long, glabrous. Leaves 2–3 foliolate, with the terminal leaflet often modified into a simple tendril, not uncinate; petiole 0.5–0.9 cm long, pubescent, with simple trichomes; petiolules 0.2–0.7 cm long, pubescent, with simple trichomes; leaflets membranaceous, 1.0–5.1 × 0.6–2.0 cm, elliptic, base rounded to truncate, apex rounded to attenuate, margin crenate, not revolute, concolor, adaxial surface pubescent only in main vein, with simple trichomes, abaxial surface pubescent, with simple trichomes, venation actinodromous. Inflorescence a simple thyrse, axillary; bracts and bracteoles ca. 0.2 cm long, elliptic. Calyx cupular, coriaceous, ca. 0.4 × 0.3 cm, 5-dentate, lobes attenuate, green, not spongy, pubescent, with simple trichomes; corolla infundibuliform, membranaceous, 3.0–4.5 × 1.5–2.0 cm, white, internally yellow, externally pubescent, with simple trichomes; stamens included, anthers ca. 0.4 cm long, dorsal filaments 1.3–1.7 cm long, ventral filaments 0.7–1.0 cm long, staminode ca. 0.3 cm long; ovary elliptic, sessile, 0.4 × 0.2 cm, smooth, glabrous, style ca. 2.6 cm long, stigma ca. 0.2 cm long, elliptic; disk annular. Capsule linear, ca. 9.1 × 1.8 cm, coriaceous, flattened, 2-parted, base rounded, apex long attenuate, velutinous, with lenticels, without wings, without a longitudinal ridge, with simple trichomes, margin entire, calyx persistent; seeds elliptic, 1.0–1.5 × 1.3–2.2 cm, wings membranaceous.

Selected Material: Salgueiro, 07º59'04"S, 39º07'42"W, 501 m, 31.III.2009, fr., *J.G. Carvalho-Sobrinho & G.C. Rodrigues 2102* (IPA). Buique, Vale do Catimbau, 08º33'25"S, 37º14'02"W, 851 m, 7.V.2013, fl., *G.C. Delgado-Júnior et al. 638* (IPA).

Tanaecium parviflorum is endemic to Brazil, where it occurs in Atlantic forest, Caatinga, and Cerrado vegetation from Ceará to Minas Gerais, and Mato Grosso do Sul (Lohmann 2010; Frazão & Lohmann 2019). In Pernambuco, it was collected growing in Caatinga exclusively. *Tanaecium parviflorum* can be distinguished by the leaflets membranaceous with margin crenate (Fig. 5k), and corolla white to lilac, internally yellow. Collected with flowers from February to May, and fruits from March to July.

13.4. *Tanaecium pyramidatum* (Rich.) L.G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008. Fig. 6l

Liana; branchlets cylindrical, striated, with lenticels, densely pubescent, with simple trichomes; prophylls of the axillary buds bromeliad-like, foliaceous, ca. 0.2 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a bifid tendril, not uncinate; petiole 2.2–2.4 cm long, pubescent, with simple trichomes; petiolules 1.8–2.1 cm long, pubescent, with simple trichomes; leaflets chartaceous, 3.6–8.1 × 1.9–4.6 cm, elliptic to ovate, base cuneate to rounded, apex acute to acuminate, margin entire, not revolute, concolor, adaxial surface glabrous, abaxial surface pubescent over the main veins, with simple trichomes, venation brochidodromous. Inflorescence a simple thyrse, terminal; bracts and bracteoles absent. Calyx cupular, coriaceous, 0.6–0.8 × 0.5–0.8 cm, truncate, irregulary divided or 2-lobed, light pink, not spongy, pubescent, with glandular trichomes; corolla infundibuliform, membranaceous, 2.2–4.5 × 0.9–1.1 cm, light pink, internally white, externally densely velutinous, with simple trichomes; stamens included, anthers ca. 0.2 cm long, dorsal filaments 1.7–2.1 cm long, ventral filaments 1.5–1.7 cm long, staminode ca. 0.2 cm long; ovary elliptic, sessile, ca. 0.3 × 0.1 cm, smooth, glabrous, style 2.1 cm long, stigma ca. 0.2 cm long, ellipsoid; disk annular. Capsule linear, 15.9–30.1 × 0.9–1.1 cm, coriaceous, flattened, 2-parted, base attenuate, apex acuminate, glabrous, without lenticels, without wings, without a longitudinal ridge, margin entire, calyx persistent; seeds not seen.

Selected Material: Cabo de Santo Agostinho, 24.II.1961, fl., *A. Lima 61-3725* (IPA). Recife, 25.I.1952, fl., *Ducke 2304* (IPA).

Additional Examined Material: BRAZIL. ALAGOAS: Ibateguara, Coimbra, 13.XII.2001, fr., *M. Oliveira & A. Grilo 671* (IPA).

Tanaecium pyramidatum is one of the most widespread and commonly collected species of Bignonieae (Lohmann & Taylor 2014). It is distributed through dry to humid forest vegetation from Mexico to Uruguay (Lohmann & Taylor

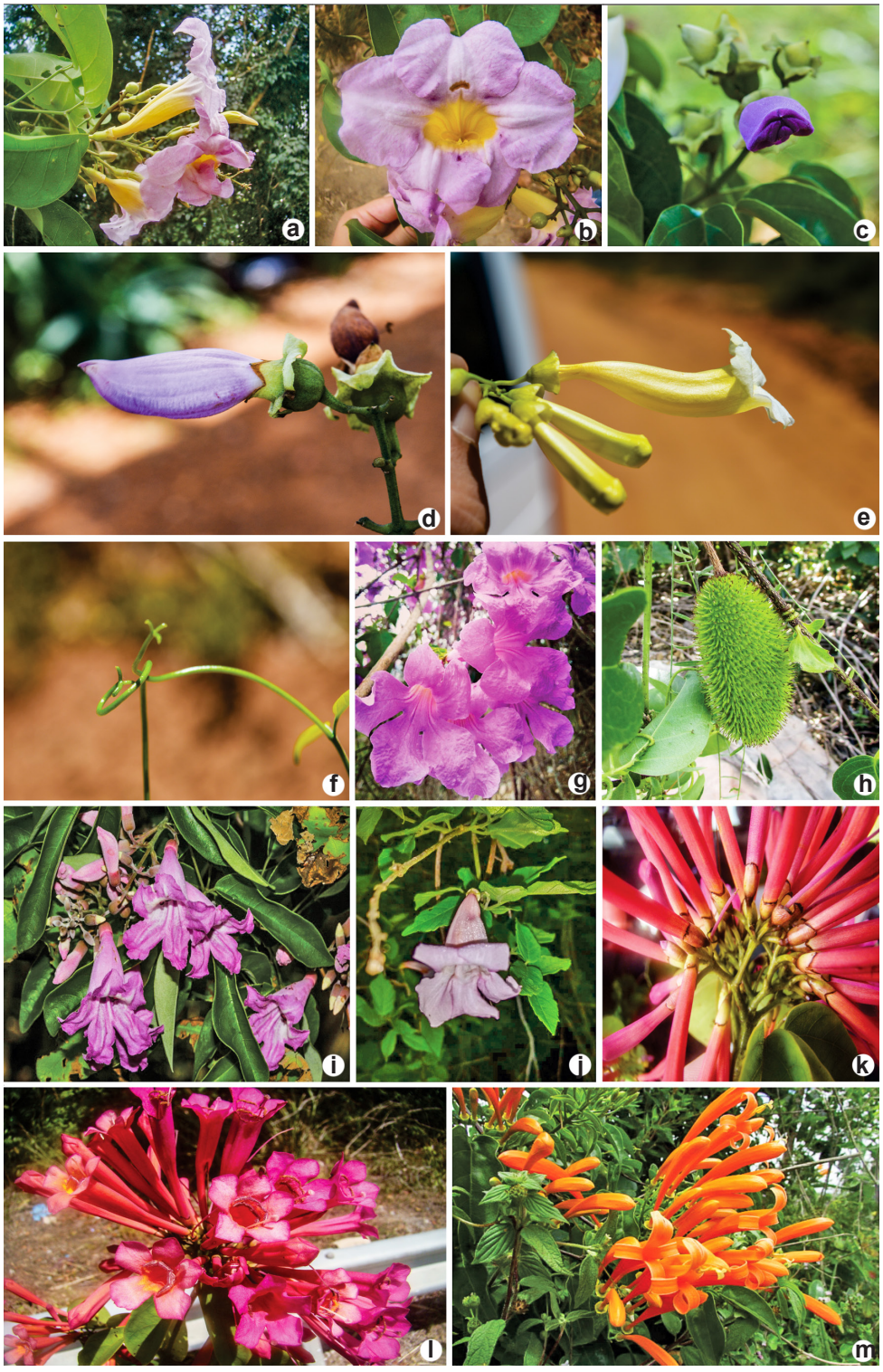

Figure 7 – a-b. *Adenocalymma cristicalyx* – a. inflorescence; b. flower. c-d. *Amphilophium paniculatum* – c. flower, evidencing the opening of the corolla; d. flower, evidencing the calyx. e-f. *Anemopaegma citrinum* – e. inflorescence; f. tendrils. g-h. *Bignonia ramentacea* – g. inflorescence; h. fruit. i. *Fridericia conjugata* – inflorescence. j. *Tanaecium parviflorum* – flower. k-l. *Lundia longa* – k. inflorescence, evidencing the calyx; l. inflorescence. m. *Pyrostegia venusta* – inflorescence.

2014). In Brazil, it occurs in all states and phytogeographical domains (Lohmann 2010; Frazão & Lohmann 2019). In Pernambuco, it was collected in Caatinga vegetation exclusively. *Tanaecium pyramidatum* can be recognized by the bifid tendril, calyx truncate to irregulary divided (Fig. 6l), and corolla infundibuliform, light pink externally and white internally. Collected with flowers in January and February.

13.5. *Tanaecium selloi* (Spreng.) L.G. Lohmann, Nuevo Cat. Fl. Vasc. Venezuela 274. 2008.

Liana; branchlets cylindrical, striated, with lenticels, glabrous; prophylls of the axillary buds bromeliad-like, foliaceous, 0.2–0.4 cm long, glabrous. Leaves 2–3-foliolate, with the terminal leaflet often modified into a simple tendril; petiole 0.8–3.7 cm long, glabrous; petiolules 0.7–1.2 cm long, glabrous; leaflets chartaceous, 3.2–6.8 × 1.9–3.8 cm, elliptic to ovate, base cordate to truncated, apex acute to acuminate, margin entire, not revolute, concolor, glabrous, venation brochidodromous. Inflorescence a simple thyrse, terminal; bracts and bracteoles absent. Calyx cupular, coriaceous, 0.7–0.8 × 0.3–0.5 cm, truncate or 2-lobed, green to lilac, not spongy, glabrous; corolla infundibuliform, membranaceous, 3.3–3.8 × 0.9–1.2 cm, lilac, white internally, externally densely velutinous, with simple trichomes; stamens included, anthers ca. 0.2 cm long, dorsal filaments 1.6–1.8 cm long, ventral filaments 1.3–1.6 cm long, staminode ca. 0.2 cm long; ovary elliptic, sessile, ca. 0.3 × 0.1 cm, smooth, glabrous, style 1.9 cm long, stigma ca. 0.2 cm long, ellipsoid; disk annular. Capsule linear, 36.8 × 1.2 cm, coriaceous, flattened, 2-parted, base attenuate, apex acuminate, glabrous, without lenticels, without wings, margin entire, calyx persistent; seeds not seen.

Selected Material: Serra do Araubá, 23.II.1962, fl., *Gomes 1265* (RB). Bezerros, Serra Negra, 16.IV.1995, fl., *L.P. Félix* (RB 722226).

Additional Examined Material: BRAZIL. RIO DE JANEIRO: Rio Bonito, Serra do Braçanã, 21.II.2016, fr., *D.N.S. Machado 842* (RB).

Tanaecium selloi is found in dry to wet vegetation from Venezuela to Argentina. In Brazil, it occurs in Caatinga, Cerrado, and Atlantic forest vegetation along the coast from Ceará to Rio Grande do Sul, and in Goiás, Mato Grosso do Sul and Roraima (Lohmann 2010; Frazão & Lohmann 2019). In Pernambuco, it was collected growing in Atlantic forest vegetation. *Tanaecium selloi* can be recognized by the simple tendril, and by the prophylls of the axillary buds minute and triangular or foliaceous**.** Collected with flowers in February and April.

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