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Original Paper

The Eupatorieae tribe (Asteraceae) in Caparaó National Park, Espírito Santo / Minas Gerais, Brazil

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Abstract

The systematic treatment of Eupatorieae tribe (Asteraceae) in the Caparaó National Park, Espírito Santo, Minas Gerais, Brazil, was carried out. Identification key, descriptions, taxonomic comments, flowering and fruiting data, illustrations and conservation status were provided for the species. In total, 35 species from 16 genera and 11 subtribes were surveyed, highlighting the great richness of this tribe in forest formation and mountain higlands in this national park. The most diverse genus is *Mikania* (14 spp.), followed by *Chromolaena* (four spp). The other genera are represented by either one or two species each. Twenty-one species are exclusive to Brazil and four species are restricted for the Atlantic Forest. Three species are new occurrence from Minas Gerais, meanwhile nine species are new record from Espírito Santo and five new occurrence for the Atlantic Forest biome. *Symphyopappus myricifolius* is an endemic species for the Caparaó National Park mountain highlands, and *M. additicia* is an endangered species.

Key words: endemism, Mata Atlântica, *Mikania*, Mountain Highlands.

Resumo

Este trabalho realiza o tratamento sistemático da tribo Eupatorieae (Asteraceae) no Parque Nacional do Caparaó, Espírito Santo, Minas Gerais, Brasil. O tratamento consta de uma chave de identificação, descrições, comentários taxonômicos, dados de floração e frutificação, ilustrações e *status* de conservação para as espécies. No total foram levantadas 35 espécies, pertencentes a 16 gêneros e 11 subtribos, destacando a riqueza da tribo em formações florestais e em campos de altitude neste parque nacional. O gênero mais diverso é *Mikania* (14 spp.), seguido por *Chromolaena* (quatro spp.). Os demais gêneros são representados por uma ou duas espécies cada. Vinte e uma espécies são exclusivas do Brasil e destas, quatro estão restritas à Mata Atlântica. Três espécies são novas ocorrências para Minas Gerais, enquanto nove são novos registros para o Espírito Santo e cinco são novas ocorrências para Mata Atlântica. *Mikania additicia* encontra-se ameaçada de extinção e *Symphyopappus myricifolius* é uma espécie endêmica dos campos de altitude do Parque Nacional do Caparaó.

Palavras-chave: endemismo, Mata Atlântica, *Mikania*, Campos de altitude.

Introduction

The Eupatoriae (Asteraceae) is a monophyletic tribe that belongs to the Asteroideae subfamily (Panero & Crozier 2016). The tribe is one of the most diverse within Asteraceae having 2,400 species belonging to 180 genera, organized in 19 subtribes (Robinson *et al.* 2009). This tribe is morphologically characterized by a generally opposite phyllotaxy, discoid capitula, a never-yellow corolla, style branches with a sterile apical

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elongated appendage and blackened cypselae due to phytomelanin deposition in the ripe fruit (Robinson *et al.* 2009).

The tribe has an essentially Neotropical distribution, with most species concentrated in Central and South America (Rivera *et al.* 2016). Brazil is one of the countries with the largest number of species (Rivera *et al.* 2016; BFG 2018), high rate of endemism (Nakajima *et al.* 2017), and the species occur mainly in the South, Southeast and Central-West regions (BFG 2018).

Brazilian systematic studies of the Asteraceae, and particularly Eupatorieae, are concentrated in the *Cerrado* phytogeographic biome, where Asteraceae and Eupatorieae are highly representative (*e.g.*, Ribeiro & Teles 2015; Reis 2015; Roque *et al.* 2016; Contro & Nakajima 2017).

However, these high diversity and endemism of Asteraceae and Eupatorieae tribe also occur at Atlantic Forest biome (Borges *et al.* 2010; Salimena *et al*. 2013; Rivera *et al*. 2016.) According to Teles *et al.* (2009), the diversity of species and the rate of endemism in this biome are due to two main genera: *Mikania* Willd. and *Baccharis* L., with 121 e 135 species, respectively (BFG 2018).

The Atlantic Forest is one of the 35 biodiversity hotspots due to its high biological diversity, high endemism rate and high threated by human ativities (Mittermeier *et al.* 2011). The floristic richness have 20,000 plant species, of which 8,000 species are restricted to this biome (Mittermeier *et al.* 2011; ICMbio 2015), and according to the "Manual Técnico da Vegetação Brasileira" (IBGE 2012), this phytogeographic biome is subdivided into forest formations (Ombrophilous Forest - Dense or Open Mixed Ombrophilous Forest; Seasonal Semideciduous or Deciduous Forest) and non-forest formations, such as mangroves, "restingas", mountain highlands and swamps.

So, the specific diversity of Atlantic Forest can be partially accounted for by its vegetational complexity, as well as its edaphic and climatic conditions of each microenvironments, particularly in the mountain highlands (Almeida *et al.* 2004). However, floristic studies involving the Asteraceae family and/or Eupatorieae tribe in Atlantic Forests highlands vegetations are still scarce (Barroso 1957; Almeida *et al.* 2004; Caiafa & Silva 2005; Borges *et al.* 2010; Meireles *et al.* 2014; Carrijo *et al.* 2018).

From conservation point of view, the Atlantic Forest has only 28% of natural vegetation, and only 30% is under protection by conservation unities (Rezende *et al.* 2018). In this way, the Caparaó National Park (PNC) has extreme conservation importance since its boundaries are inside in one of most threatened ecosystem of the world (ICMBio 2015).

Currently, PNC has three lists of species: one of phanerogamic species (Leoni 1997), one of angiosperm endemic species (Leoni & Souza 1999), and the online list of PNC plant species (Carrijo *et al.* 2018). Also, there are systematic treatments for some families, subfamily, or subtribes (*e.g.*, Faria *et al.* 2006; Forster & Souza 2013), and descriptions of several new and/or endemic species, including Asteraceae (Heiden & Schneider 2011; Heiden *et al.* 2014).

Regardless of the highlands vegetation importance and of the PNC for the Brazilian flora diversity and conservation, there are no Asteraceae taxonomic treatments for this Conservation Unit. In this way, this study carried out a systematic treatment of the Eupatorieae Cass tribe. (Asteraceae) in Caparaó National Park, Espírito Santo and Minas Gerais states, Brazil.

Material and Methods

Study area

Caparaó National Park is located between the states of Espírito Santo (ES) and Minas Gerais (MG) (Fig. 1), with around 80% of the area located in ES. The PNC is located between 20º19'–20º37'S and 41º43'–41º55'W, and has a total area of 324 km². It contains the third highest point of Brazil, the Pico da Bandeira, with 2,891.32 m of elevation (ICMBio 2015).

The park is covered by Montane Semideciduous Forest (400 m–1,000 m) vegetation in the Minas Gerais state portion, Montane Dense Ombrophilous Forest and Upper Montane Dense Ombrophilous Forest (1,000 m–1,700 m) in the Espírito Santo state portion (Fig. 2) (ICMbio 2015). In these vegetational formations, Melastomataceae, Tiliaceae, Vochysiaceae, Lauraceae e Myrtaceae are the most representative families (ICMbio 2015).

In the highlands, these forest formations are replaced by mountain highlands (Fig. 2), which occur on rounded geoforms of igneous or metamorphic rocks with elevation from 1,500–1,800 m to approximately 2,900 m at Pico da Bandeira in Caparaó National Park (Caiafa & Silva 2005; Safford 2007; Vasconcelos 2011).

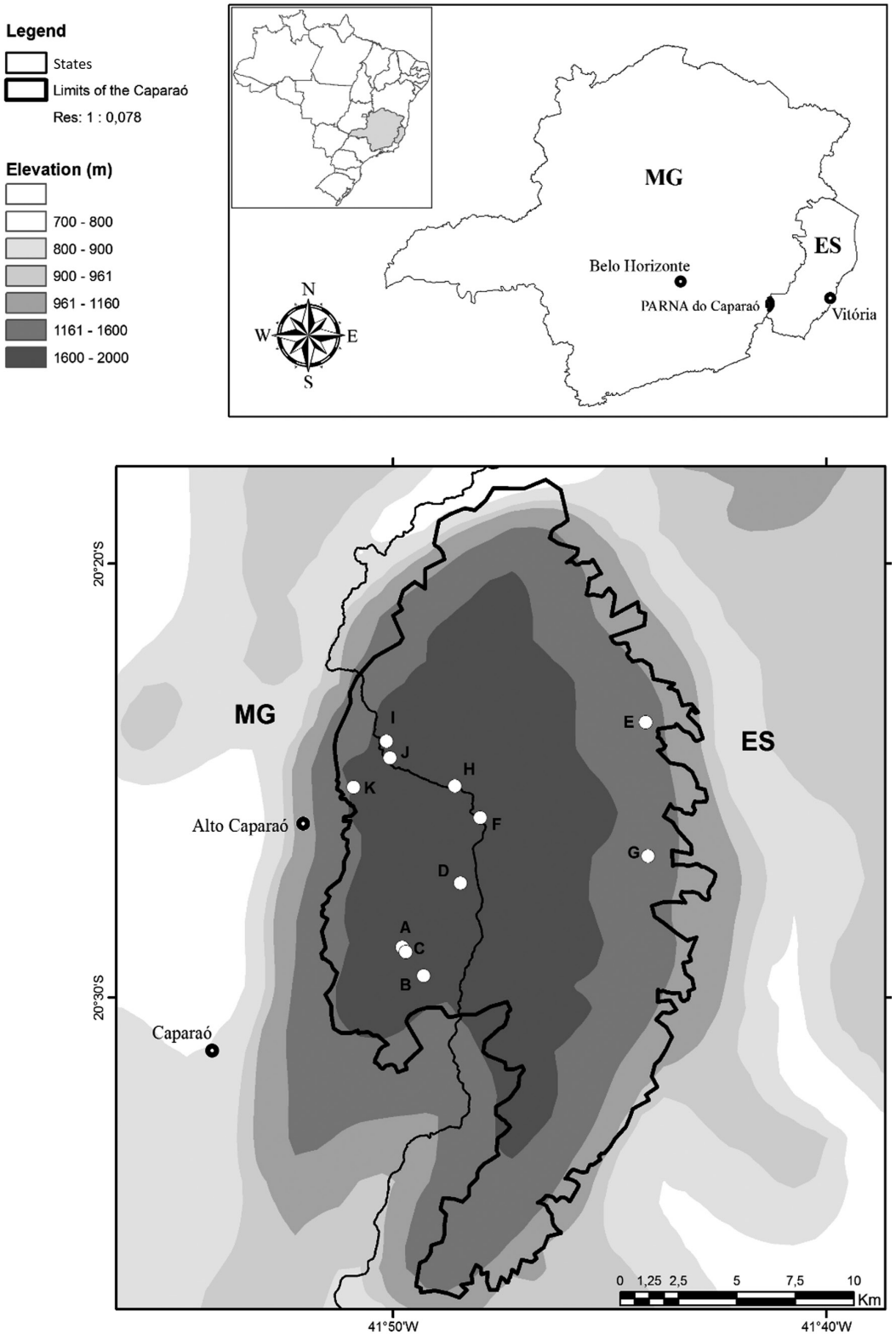

Figure 1 – Map of the Caparaó National Park with its main georeferenced colletion points: A = Cachoeira do Aurélio; B = Casa "beija-flores"; C = Macieira; D = Pedra Duas Irmãs; E = Pedra Roxa; F = Pico da Bandeira; G = Rio Norte; H = Terreirão; I = Tronqueira; J = Vale Encantado; K = Vale Verde.

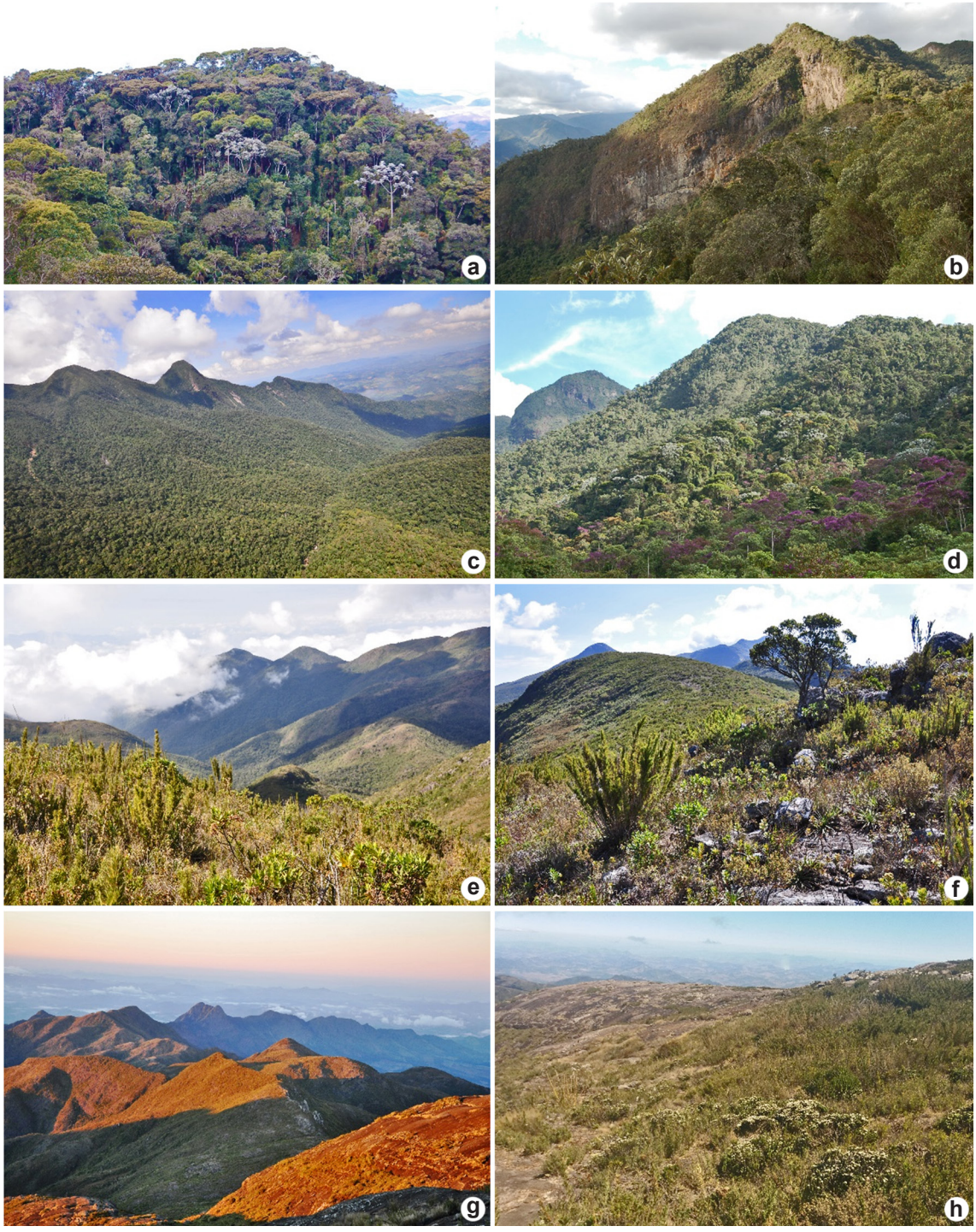

Figure 2 – a-h. Physignomies of the Atlantic Forest found in the Caparaó National Park – a-b. Dense Ombrophilous Forest / ES; c-d. Montane Semidecidous Seasonal Forest / MG; e-h. Mountain Highlands. (a-g. *B.A.P. Cosenza*; h. *C. Viana*).

The mountain lighlands are characterized by a vegetation mosaic predominantly formed by several species of herbaceous and shrubby plants, ferns, and grasses, with stretches of variable arboreal and sparce vegetations on the rocky outcrops and swamps. Besides, there are ecotonal or transitional ecosystems between forests and highlands, as well as with pasture (Caiafa & Silva 2007; Vasconcelos 2014; ICMBio 2015). The main families in these highlands vegetation formations are Asteraceae, Bromeliaceae, Droseraceae, Orchidaceae, Oxalidaceae, Poaceae, Polygalaceae, Myrtaceae and Scrophulariaceae (Leoni & Souza 1999).

The Köppen climate classification is Cwb type, characterized by highland tropical climate (ICMBio 2015). The annual average temperature varies from 19 to 22 ºC, ranging from 36 to -4 ºC in the highest peaks of the Park (ICMBio 2015). Average annual rainfall varies between 1,000 and 1,500 mm, with precipitation concentrated from November to January, representing 35 to 50% of annual rainfall (ICMbio 2015).

Collection and study of botanical specimens

The systematic treatment of Eupatorieae (Asteraceae) species in the Caparaó National Park was based mainly on the study of herbarium specimens from GFJP and HUEMG herbaria, as well as in the specimens of BHCB, CESJ, ESA, HUFU, R, RB, SPF, UEC and VIC herbaria (Thiers, continuously updated). Two expeditions each one with six days of field trips to the PNC were carried out to collect new botanical specimens: May 2016, transition between rain and dry seasons, and September 2016 during dry season. Species sampling was carried out at main collection points (Fig. 1), highlands vegetational formations and various trails, the main one was "Tronqueira - Terreirão - Pico da Bandeira" trail. It was not possible to make new collections at points E (Pedra Roxa), G (Rio Norte) e K (Vale Verde).

The specimens collected were herborized according to the techniques of Fidalgo & Bononi (1984) and incorporated into the HUEMG, with duplicates deposited in the HUFU collection.

The morphological descriptions are standardized by genus (King & Robinson 1987), and the terminology used for the descriptions of vegetative and reproductive structures followed Radford *et al.* (1974), Gonçalves & Lorenzi (2011) and Roque & Bautista (2008).

The species are presented in alphabetical order. For each species there is a description followed by the selected specimens, taxonomic comments (with additional informations from literature) and data on flowering and fruiting. Some botanical specimens deposited at the HUFU (from other locations) were analyzed to complete reproductive descriptions when the specimens in the study area were incomplete and/or degraded, and are cited as additional examined specimens. A list of exsiccatae was created, since some species had a greater number of collections, while others presented only one specimen collected.

The illustrations were made showing morphological characteristics considered important for the description of species, diagnosis of genera and sometimes used in the identification key.

The data on the geographic occurrence of the species were cited only for species exclusive to Brazil, outlining those that represented new records for the Atlantic Forest, for the states of Espiríto Santo and/or Minas Gerais, according to the Flora Species List of Brazil (BFG 2018).

The occurrence data in specific habitats within the PNC, and on flowering and fruiting, were cited based on field observations during the collections and/or when informed on the labels of the examined specimens.

The conservation status of the species was taken from the Red Book of Flora of Brazil (CNCFlora 2017; BFG 2018).

Results and Discussion

In the Caparaó National Park there are 35 Eupatorieae species distributed in 16 genera and 11 subtribes (Figs. 3-5). Twenty-one species are exclusive to Brazil and represent approximately 60% of all sampled species (BFG 2018).

The most representative genus is *Mikania* with 14 species, the majority with a scandent habit. This diversity can be explained by the presence of forest formations in the PNC, as well as the presence of cloud forests that occur at higher altitudes. This pattern was also observed at Serra do Ibitipoca, Minas Gerais state (Borges *et al.* 2010), whose study sampled a total of 17 *Mikania* species in their mountain vegetation.

The second most representative genus is *Chromolaena* DC., with four species, occurring preferably in mountain highlands. *Chromolaena* and *Mikania* are generally the richest genera in floristic surveys (King & Robinson 1987). Both are widely distributed and present a large number of

species, which are in general locally restricted (King & Robinson 1987). The diversity of species sampled for both genera corroborates the pattern found for the tribe in studies carried out in forest formations and/or in mountain highlands in the Atlantic Forest (Borges *et al.* 2010; Almeida *et al.* 2004).

The genera *Ageratum* L., *Austroeupatorium* R.M.King & H.Rob and *Stevia* Cav. are represented by two species each, whereas the other genera were represented by only one species each.

Chromolaena porphyrolepis, *Mikania additicia*, *M. cardiophylla*, and *Symphyopappus myricifolius* are restricted to the Atlantic Forest biome. *M. additicia* e *S. myricifolius* occur in mountain highlands do PNC (2,127–2,260 m), *M. cardiophylla* occurs in Montane Semideciduous Forest (MG) and Montane Dense Ombrophilous Forest (ES) at 1,421m elevation, and *C. porphyrolepis* occurs in the transition of Montane Dense Ombrophilous Forest and mountain highlands (1,249 m).

Fifteen species have expanded their geographic range in the states of Espírito Santo, Minas Gerais or represent new records of occurrence for the Atlantic Forest.

Dasycondylus platylepis, *Mikania lanuginosa* and *M. elliptica* are new records for Minas Gerais state, while *Chromolaena pedalis*, *M. cardiophylla*, *M. conferta*, *M. lanuginosa*, *M. nodulosa*, *M. salviifolia*, *M. stylosa*, *Neocabreria pennivenia* and *Stevia urticaefolia* are new occurrences for Espírito Santo state. *Ageratum fastigiatum*, *D. platylepis*, *Mikania malacolepis*, *M. sessilifolia* DC. and *Stevia urticaefolia* Thunb. are new occurrences for Atlantic Forest.

Finally, *M. additicia* is considered threatened (EN) e *S. myricifolius* is endemic to the mountain highlands in PNC (BFG 2018), which reinforces the importance of the PNC for the conservation of the Atlantic Forest.

The present study reports important and complementary floristic data for the knowledge of flora diversity, specifically of the Eupatorieae tribe (Asteraceae) in the Caparaó National Park, which can serve as a basis for future research on these species.

Key to species of Eupatorieae of Caparaó National Park

1. Capitulum with the number of involucral bracts equal to the number of flowers.
    2. Five flowers and five involucral bracts per capitulum.
        3. Capitula arranged in densely corymbiform inflorescence; fimbriate-coroniform or coroniform and 2-aristate pappus..... 14.1. *Stevia camporum*
        3’. Capitula arranged in laxly paniculiform inflorescence; paleaceo-coroniform pappus, awns absent.....14.2. *Stevia urticaefolia*
    2’. Four flowers and four involucral bracts per capitulum.
        4. Vine.
            5. Flowers with infundibuliform corolla.
                6. Capitula arranged in glomeruliform inflorescence, sessile capitula..... ..... 11.5. *Mikania glomerata*
                6’. Capitula arranged in thyrsoid or corymbiform inflorescence, pedunculate capitula.
                    7. Cordiform leaves.....11.2. *Mikania cardiophylla*
                    7’. Elliptic, oval or deltoid leaves.
                        8. Subcoriaceous leaves, obtuse and subrounded apex; cypsela densely pubescent.....11.4. *Mikania elliptica*
                        8’. Membranaceous or cartaceous leaves, acuminate to attenuate or acute to attenuate apex; glabrous or setose cypsela.
                            9. Fistulose branches, glabrous..... 11.11. *Mikania populifolia*
                            9’. Non-fistulose branches, pubescent, velutinous-tomentose or hirsute.
                                10. Involucre ca. 10 mm long.; persistent pappus .... 11.9. *Mikania nodulosa*
                                10’. Involucre 6–8 mm long; caducous pappus.

11. Blackish branches, velutinous-tomentose; velutinous-tomentose involucral bracts..... .....11.8. *Mikania malacolepis*

11'. Reddish-brown to ferrugineous branches, hirsute; glabrescent involucral bracts, only apex hirsute .....11.13. *Mikania stylosa*

5'. Flowers with campanulate or subcampanulate corolla.

12. Hispid plants.....11.3. *Mikania conferta*

12'. Glabrous, pubescent, hirsute or lanuginose plants.

13. Entire to denticulate margin.

14. Hirsute branches; involucral bracts with acute to attenuate apex; corolla with setose lobes..... 11.6. *Mikania hirsutissima*

14'. Lanuginose branches; involucral bracts with cuneate to rounded apex; corolla with glabrous lobes..... 11.7. *Mikania lanuginosa*

13'. Crenate-dentate or erose margin.

15. Acuminate leaf apex, glandular-punctate abaxial surface; involucre ca. 5.5 × 1.6 mm; corolla with tube ca. 0.5–0.9 mm long., glandular-punctate lobes ... .11.1. *Mikania additicia*

15'. Acute leaf apex, densely tomentose abaxial surface; involucre ca. 8.5 × 2.5 mm; corolla with tube ca. 2.8 mm long., eglandular lobes ....11.12. *Mikania salviifolia*

4'. Herbs or subshrubs.

16. Capitula arranged in racemose inflorescence; leaf blade with scabro-strigose adaxial surface, tomentose abaxial surface, glandular-punctate, reticulate veins prominent..... .....11.14. *Mikania sessilifolia*

16'. Capitula arranged in corymbiform inflorescence; leaf blade with both sericeous-tomentose surfaces, reticulate veins non-prominent..... 11.10. *Mikania nummularia*

1'. Capitula with the number of involucral bracts different from the number of flowers.

17. Plumose pappus, with appendage glutinous, paleaceous-aristate or absent.

18. Capitula with 60–66 flowers; retuse anther appendage; stipitate cypsela; plumose-bristles pappus ..... 16. *Trichogoniopsis adenantha*

18'. Capitula with up to 50 flowers; ovate to lanceolate or obtuse anther appendage; non-stipitate cypsela; pappus with appendage glutinous, aristate or absent.

19. Obovoid cypsela; pappus with glutinous protuberance .... 1. *Adenostemma involucratum*

19'. Prismatic cypsela; pappus paleaceous-aristate or absent.

20. Hirsute branches, eglandular; opposite leaves, ovate; lilac corolla; paleaceous pappus, 5 aristate.....2.1. *Ageratum conyzoides*

20'. Strigose to pubescent branches, glandular-punctate; alternate leaves, linear-lanceolate to rhomboid; white to pinkish corolla; pappus absent .... 2.2. *Ageratum fastigiatum*

17'. Bristles pappus.

21. Fistulose branches; carpopodium procurrent on base of cypsela ribs..... .....6. *Dasycondylus platylepis*

21'. Non-fistulose branches; carpopodium non-procurrent on base of cypsela ribs.

22. Capitate style branches; anther appendage absent ..... 13. *Ophryosporus freyreysii*

22'. Cylindrical, filiform or claviform style branches; anther appendage present.

23. Stylar base densely pubescent.

24. Shrubs; concolor leaf blade, attenuate base, non-revolute margin, broquidrodomous venation.....3.1. *Austroeupatorium inulaefolium*

24'. Subshrubs; discolor leaf blade, rounded to truncate base, revolute margin, eucamptodromous venation.....3.2. *Austroeupatorium neglectum*

23'. Stylar base glabrous.

25. Corolla whit internally pilose limb; cypsela with setose apex and base .... 12. *Neocabreria pennivenia*
25'. Corolla whit internally glabrous limb; cypsela glabrous, setose, only setose in the ribs or glandular.
26. Capitula with five flowers.
27. Ribbed branches, vernicose, sulcate, glabrous or puberulent; leaf margin apically 2/3 crenate to crenate-serrate; vernicose involucral bracts ..... 15. *Symphyopappus myricifolius*
27'. Cylindrical branches, non-vernicose, striate, pubescent or furfuraceous; leaf margin serrate or serrulate to its full extent, non-vernicose involucral bracts.
28. Broquidrodomous leaf venation, lilac to vinaceous corolla ..... 4. *Campovassouria cruciata*
28'. Eucamptodromous leaf venation, white corolla ..... 8. *Grazielia gaudichaudiana*
26'. Capitula with 10–26 flowers.
29. Cylindrical involucre.
30. Capitula with 10–14 flowers; involucral bracts whit apex vinaceous, glandular-punctate ..... 5.3. *Chromolaena pedalis*
30'. Capitula with 22–26 flowers; involucral bracts whit apex greenish or brownish, eglandular.
31. Erect branches, vernicose, glabrous; elliptical, narrowly elliptical or oblanceolate leaf blade, 2/3 serrate-dentate margin ..... 5.1. *Chromolaena laevigata*
31'. Candelabriform branches, non-vernicose, pubescent or pilose to setose; narrow-ovate, ovate, oval-lanceolate to lanceolate leaf blade, entire to serrate ou denticulate margin.
32. Membranaceous leaves, non-revolute margin, both surfaces pilose ..... 5.2. *Chromolaena maximilianii*
32'. Cartaceous leaves, revolute margin, scabrous-strigose adaxial surface, slightly rugose, scabrous-tomentose abaxial surface, glandular-punctate ..... 5.4. *Chromolaena porphyrolepis*
29'. Campanulate involucre.
33. Greenish involucral bracts; flat receptacle ..... 7. *Fleischmannia remotifolia*
33'. Brownish or vinaceous involucral bracts; slightly convex or conical receptacle.
34. Brown-greenish or brownish branches; membranaceous leaf blade, decurrent base, serrate margin; Capitula arranged in broadly paniculiform inflorescence; flowers 22–24; cypsela 5-ribbed ..... 9. *Heterocondylus alatus*
34'. Ferruginous branches; cartaceous leaf blade, cuneate, obtuse to rounded or truncate base, crenate to crenulate margin, Capitula arranged in corymbiform inflorescence; flowers 70–80; cypsela 7–8-ribbed ..... 10. *Koanophyllon thysanolepis*

1. *Adenostemma involucratum* R.M.King & H.Rob. Phytologia 29(1): 7. 1974.

Herbs, 0.3–0.4 m tall; branches fistulose, pubescent, brownish. Leaves opposite, petiole 5–45 mm long., blade 3.5–11.7 × 1.2–3.9 cm, narrow-deltoid to deltoid, membranaceous, apex acute, base truncate to decurrent, margin denticulate, flat, both surfaces sparsely strigose, eucamptodromous, midrib sparsely strigose or glabrous. Capitula terminal, branches pubescent, peduncles 6–24 mm long.; involucre campanulate, subimbricate, ca. 7 × 3.5 mm; bracteole subsessile linear, ca. 3 × 0.2 mm, sparsely strigose, apex acute, greenish; involucral bracts 17–20, 2-seriate, oblong to obovate, 2 × 0.7 mm, apex rounded, glandular, hyaline, margin sparsely ciliate or glandular; receptacle flat, epaleaceous, glabrous. Flowers 30–34, corolla tubulose, white, tube ca. 2.5 mm long., glandular, lobes triangular, erect, papilose, hirsute; apical anther appendages obtuse, base obtuse; stylar branches claviform, papilose, densely pilose, base cylindrical, glabrous. Cypsela obovoid, ca. 2 mm long., 1–3-ribbed, glutinous, carpopodium conspicuous, asymmetric. Pappus with three protuberance glutinous, two bigger and one smaller.

Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, Vale Verde, Trilha do Jacú, 20º25.1'58"S, 41º50.63.9"W, 1,338 m, 10.I.2013, fl., *J. Kuntz & G.D. Colletta 803* (ESA, HUFU); 19.III.2014, fl. and fr., *V.C. Souza et al. 38118* (ESA, HUFU).

The species is not exclusive to Brazil. It occurs in the Montane Semideciduous Forest, and

in the study area, it was found in gallery forest, 1,338 m above sea level. Flowering from January to March and fruiting in March.

Adenostemma involucratum can be easily recognized by deltoid leaves, longer than wide, truncate to decurrent base, capitula with 30–34 flowers, obovoid and glutinous cypsela, and pappus with three glutinous protuberances.

2.1. ***Ageratum conyzoides*** L. Sp. Pl. 2: 839. 1753.

Herbs, 0.3 m tall; branches slightly ribbed, sparsely hirsute, eglandular, brown-reddish. Leaves opposite, petiole 8–9 mm long., densely hirsute, blade 2.6–2.9 × 1–1.4 cm, ovate, membranaceous, apex cuneate, base cuneate or rounded, margin serrate, flat, both surfaces densely hirsute, eucamptodromous, midrib hirsute. Capitula arranged in inflorescence dichasial, terminal, branches hirsute, peduncle ca. 3.2 mm long.; involucre campanulate, subimbricate, ca. 4 × 3.4 mm; bracteole subsessile, linear, ca. 2 × 0.3 mm, sparsely hirsute, apex acute, purplish; involucral bracts 18–20, 2-seriate, lanceolate, ca. 3 × 0.5 mm, apex acute to attenuate, fimbriate, margin sparsely ciliate; receptacle convex, epaleaceous, glabrous. Flowers ca. 45, corolla narrow-tubulose, lilac, tube ca. 1 mm long., glandular, base enlarged, lobes triangular, erect, densely papilose; apical anther appendages ovate, base obtuse; stylar branches cylindrical, glabrous, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 1.25 mm long., 5-ribbed, apex and ribs setose, carpopodium conspicuous, asymmetric. Pappus 5-aristate, white, ca. 1.47 mm long, awns free.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, road Paraíso/ Portaria Pedra Menina, 13.IX.2017, fl. and fr., *I.T.F.V. Lopes et al. 241* (HUEMG, HUFU).

The species is not exclusive to Brazil and although it is commonly found in several Brazilian phytogeographic biomes (BFG 2018), it was collected only once during botanical expedition to the PNC. In the study area, *A. conyzoides* occurs on the edges of Montane Dense Ombrophilous Forest, across from a lavender cultivated field and in an anthropized area, such as camps and trails. Flowering and fruiting in September.

Ageratum conyzoides can be differentiated by an herbaceous habit, hirsute branches, ovate leaves, capitula with 45 flowers, lilac corolla, paleaceous pappus, 5-aristate. According to Staudt & Roque (2020), *A. conyzoides* has until 75 flowers per capitulum.

2.2. ***Ageratum fastigiatum*** (Gardner) R.M.King & H.Rob. Phytologia 24(2): 114. 1972.

Herbs, ca. 0.5 m tall.; branches cylindrical, striate, strigose to pubescent glandular-punctate, brown-greenish. Leaves alternate or fasciculate, petiole ca. 6mm long., glabrous, blade 5.5–11.5 × 1.5–2 cm, apical linear-lanceolate, basal rhomboid, membranaceous, apex cuneate, base attenuate, margin crenate-dentate, flat, both surfaces densely glandular-punctate, camptodromous, midrib pilose or setose. Capitula arranged in inflorescence cymose, terminal, branches strigose, glandular-punctate, peduncle 1.5–3 mm long.; involucre campanulate, subimbricate, 7 × 3.5 mm; bracteole linear, ca. 1.5–2 × 0.3 mm, apex acute, strigose, glandular-punctate; subinvolucral bracteole ovate 2 × 0.5 mm, apex acute, strigose,glandular-punctate; involucral bracts 20, 3-seriate, elliptical to oblanceolate, 2.5 × 1.5–0.9 mm, apex acute to attenuate, margin sparsely ciliate, sometimes vernicose; receptacle convex, epaleaceous, glabrous. Flowers ca. 30, corolla infundibuliform, tube ca. 1 mm long., glandular, base enlarged, glandular, lobes triangular, deflexed, sometimes glandular-punctate; apical anther appendages ovate to obtuse, base obtuse to attenuate; stylar branches cylindrical, glabrous, slightly claviform, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 1.5 mm long., 5-ribbed, glabrous, carpopodium asymmetric. Pappus absent.

Selected material: MINAS GERAIS: Espera Feliz, Caparaó National Park, next road of the Park, to the right side of the highway, 14.V.2016, fl. and fr., *L.S. Leoni & I.T.F.V. Lopes 10151* (HUFU).

The species is not exclusive to Brazil, and it is common in areas of rocky vegetation and anthropized areas of the Amazon, Caatinga and Cerrado biomes. With this work, its area of occurrence is extended to the Atlantic Forest biome (BFG 2018). In the study area, it had not previously been collected and was found on a pavemented road. Flowering and fruiting in May.

Ageratum fastigiatum characterized by alternate leaves, generally fasciculate, lanceolate-rhomboid, glandular-punctate in both surfaces, campanulate involucre, 30 flowers per capitulum, white to pink corolla and absent pappus. This species has also multicostate stems and capitula with 20–27 flowers (Contro & Nakajima 2017).

3.1. ***Austroeupatorium inulaefolium*** (Kunth) R.M.King & H.Rob. Phytologia 19(7): 434. 1970.

Shrubs, 0.4–0.7 m alt.; branches cylindrical, striate, base glabrescent, apex pubescent to slightly

sericeous-tomentose, glandular-punctate, with darkened longitudinal spots. Leaves opposite, petiole 1.5–8.5 mm long., blade 6.5–9 × 1.5–4 cm, oval-lanceolate, patent, membranaceous, apex acute to attenuate, base attenuate, margin serrate, flat, adaxial surface strigose, abaxial surface hispid, glandular-punctate, broquidrodomous, midrib hispid. Capitula arranged in inflorescence corymbiform terminal, branches densely sericeous-tomentose, glandular-punctate; peduncles, 1–2.5 mm long.; involucre cylindrical, slightly campanulate, subimbricate, ca. 4.5 × 2.5 mm, bracteole linear, ca. 1.5 mm long., sericeous-tomentose, apex cuneate to acute; involucral bracts ca. 12, 3–4 seriate, stria longitudinal brownish; outer ovate, ca. 1.5 × 0.5 mm, sericeous-tomentose, apex cuneate, ciliate, base sparsely glandular-punctate; inner linear, ca. 6 × 1 mm, apex acute, ciliate; receptacle convex, epaleaceous, glabrous. Flowers 7, corolla funeiform, tube ca. 3.5 mm long., sparsely glandular-punctate, lobes triangular, erect, papilose, glandular-punctate; apical anther appendages obtuse, glabrous, base attenuate; stylar branches filiform, papilose, base cylindrical, densely pubescent. Cypsela prismatic, ca. 2.5–3 mm long., 5-ribbed, glandular-punctate, carpopodium conspicuous, asymmetrical. Pappus bristly, white, ca. 3.5 mm long., bristles partially connate.

Selected material: MINAS GERAIS: Caparó National Park, 3.IV.2006, fl., *B.V. Tinti et al. 239* (HUEMG, HUFU).

The species is not exclusive to Brazil, and it is often found in forest and grasslands environments (BFG 2018). In the study area, *A. inulaefolium* occurs in Montane Semideciduous Forest. Flowering in April.

Austroeupatorium inulaefolium can be recognized by oval-lanceolate, membranaceous leaves, seven-flowered capitula, densely pubescent cylindrical stylar base, glandular-punctate cypsela. According to Martins (2017), *A. inulaefolium* also is a ramificated subshrub, and has leaves with abaxial surface strongly reticulated.

3.2. *Austroeupatorium neglectum* (B.L.Rob.) R.M.King & H.Rob. Phytologia 19(7): 434. 1970. Fig. 4a-b

Subshrubs, 0.4–0.7 m tall; branches cylindrical, striate, pubescent to pilose. Leaves opposite, petiole 1.5–3 mm long., blade 2–6 × 1–2.5 cm, oval to oval-lanceolate, patent, membranaceous, apex acute, base rounded to truncate, margin serrate, revolute, adaxial surface strigose, abaxial surface pilose, glandular-punctate, eucamptodromous, midrib strigose to pilose. Capitula arranged in inflorescence corymbiform, branches pubescent to pilose; peduncles 1.5–3 mm long.; involucre cylindrical, slightly campanulate, subimbricate, ca. 7 × 3–4.5 mm, bracteole linear, ca. 1.5–1 × 0.5 mm, pubescent, apex obtuse to rounded; involucral bracts ca. 15, 3-seriate, margin ciliate, glabrous, greenish; outer ovate, ca. 1 × 0.5 mm, apex obtuse; inner linear to oblanceolate, ca. 5.5 × 1 mm, apex rounded to cuneate; receptacle convex, epaleaceous, glabrous. Flowers 12, corolla funeiform, glabrous, tube ca. 5 mm long., lobes triangular, papilose, erect; apical anther appendages obtuse, setose, base attenuate; stylar branches filiform, papilose, setose or glabrous, base cylindrical, densely pubescent. Cypsela prismatic, ca. 2.5–3 mm long., 5-ribbed, glandular-punctate, carpopodium conspicuous, asymmetric. Pappus bristly, white, ca. 3.5 mm long., bristles free.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Casa Queimada, 1.IV. 2006, *C.G. Viana et al. 311* (HUEMG). MINAS GERAIS: Espera Feliz, to the right side of the highway, towards Lajão, beside the trilha, 14.V.2016, fl. and fr., *L.S. Leoni & I.T.F.V. Lopes 10139* (GFJP, HUFU).

The species is not exclusive to Brazil, and it occurs in Montane Semideciduous Forest, Montane Dense Ombrophilous Forest and mountain highlands. In the PNC, was found at elevations of 1,944–2,890 m. Flowering between March and May and fruiting in September.

Austroeupatorium neglectum can be recognized by oval to oval-lanceolate leaves, rounded or truncate base, revolute margin, capitula with 12 flowers.

4. *Campovassouria cruciata* (Vell.) R.M.King & H.Rob. Phytologia 49(1): 3 (1981).

Shrubs, 1–1.7 m tall.; branches slightly striate, furfuraceous, glabrescent. Leaves decussate, alternate in the upper portion, sessile to petiolate ca. 1 mm long., blade 9–10 × 0.8–1 cm, narrow-lanceolate, lanceolate or linear-lanceolate, cartaceous, apex acute to caudate, base attenuate, margin serrate, slightly revolute, adaxial surface glandular-punctate, abaxial surface glandular-punctate, furfuraceous, broquidrodomous, midrib glabrous. Capitula arranged in inflorescence densely corymbiform, terminal, branches pubescent-furfuraceous, peduncle 2–2.5 mm long.; involucre cylindrical, subimbricate, ca. 8 × 1.5 mm; bracteole linear, ca. 1.5 × 0.2 mm, pubescent,

Figure 3 – a-f. Eupatorieae species from the of Caparaó National Park – a. *Campovassouria cruciata*; b. *Chromolaena pedalis*; c. *Stevia camporum*; d. *Stevia urticaefolia*; e-f. *Symphyopappus myricifolius*. (a,c,d,e. *I.T.F.V. Lopes*; b. *B.A.P. Cosenza*; f. *R. Pacheco*).

apex cuneate; involucral bracts 12–14, 4–5 seriate, glabrescent, margin ciliate; outer oblong-ovate, ca. 1.5 × 0.5 mm, apex attenuate to rounded, pubescent, ciliate; inner narrow-elliptical or oblong, ca. 5 × 2 mm, caducous, apex obtuse to rounded, pubescent, ciliate; receptacle flat, epaleaceous, pilose. Flowers 5, corolla tubulose, tube ca. 4.5 mm long., sparsely glandular-punctate, lobes triangular, erect, sparsely glandular-punctate or eglandular; apical anther appendages oval-lanceolate, base obtuse to truncate; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 2 mm long., 5-ribbed, glabrous to sparsely glandular, carpopodium symmetric. Pappus bristly, white, 4 mm long., bristles partially connate.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, trail to Pedra Duas irmãs, Caparaó National Park, 22.III.2012, fl. and fr., *J. Kuntz et al 629* (ESA, HUEMG). MINAS GERAIS: Alto Caparaó, Caparaó National Park, 12.II.1996, fl., *L.S. Leoni 3191* (GFJP, HUFU).

The species is not exclusive to Brazil and the species occurs in Montane Semideciduous Forest, Montane Dense Ombrophilous Forest and, it is frequently in areas of transition from forest to mountain highlands and to park trails, at 1,790–2,400m. Flowering from January to May and fruiting between February and May.

Campovassouria cruciata can be recognized by vinaceous-grayish, furfuraceous, leafy branches with short internodes and capitula with five flowers, and lilac to vinaceous corolla.

5.1. *Chromolaena laevigata* (Lam.) R.M.King & H.Rob. Phytologia 20(3): 202. 1970.

Shrubs 0.5–0.7 m tall.; branches cylindrical, striate, sulcate, vernicose, sparsely glandular-punctate, node pubescent. Leaves opposite, petiole ca. 7 mm long., blade 6.5–11 × 2–3.5 cm, elliptical, narrow-elliptical or oblanceolate cartaceous to subcoriaceous, apex acute, base attenuate, margin 2/3 serrate-dentate, flat, adaxial surface glandular-punctate, vernicose, abaxial surface sparsely setose, glandular-punctate, acrodromous, midrib setose or glabrous. Capitula arranged in inflorescence densely corymbiform terminal, branches glabrous, vernicose, peduncle ca. 11 mm long.; involucre cylindrical, imbricate, 10–13 × 3–4.5 mm long.; bracteole ovate, ca. 1 mm long., apex attenuate, pubescent; involucral bracts 28–30, 7–8 seriate, glabrous, vernicose, 3–4 stria longitudinal brownish, margin ciliate; outer oblong-ovate, ca. 2.5 × 1.5 mm, apex obtuse, ciliate; innear linear, ca. 8 × 0.5 mm, caducous, apex cuneate, ciliate; receptacle convex, epaleaceous, glabrous. Flowers ca. 24, corolla narrow-funeiform, glabrous, tube ca. 6 mm long., lobes lanceolate, erect, papilose; apical anther appendage obtuse, base cordate; branches stylar cylindrical, papilose, glabrous, base cylindrical, glabrous. Cypsela prismatic, ca. 3.5 mm long., glabrous, 5-ribbed, rib setose, carpopodium symmetric or asymmetric. Pappus bristly, alb, ca. 5 mm long., bristles free.

Selected material: MINAS GERAIS: Caparaó National Park, Alto Caparaó, V.2004, fl., *L.S. Leoni 5745* (GFJP). Espera Feliz, Macieira, Portaria II, 22.IV.1998, fl., *L.S. Leoni 3935* (GFJP).

The species is not exclusive to Brazil, and it has a wide distribution in all Brazilian biomes (BFG 2018). In the study area, it occurs on the side of roads and trails leading to the park and in anthropized environments. Flowering in April and May.

Chromolaena laevigata can be easily recognized by dense corymbiform capitulescence, glabrous and vernicose branches, elliptical to oblanceolate, glabrous, cartaceous to subcoriaceous leaves with distinct serrate-dentate margin and acrodromous venation.

The specimens of *C. laevigata*, when herborized, shows a shiny appearance in the foliar adaxial surface and involucre, similarly to the vernicosity of the species in the genus *Symphyopappus* Turcz.. However, it is possible to differentiate the species of these two genera by the presence of a uniseriate pappus in *Chromolaena* and biseriate in *Symphyopappus* (Contro & Nakajima 2017).

5.2. *Chromolaena maximilianii* (Schrad. *ex* DC.) R.M.King & H.Rob. Phytologia 20: 202. 1970.

Fig. 4c

Subshrub, 0.8–0.9 m tall; branches, striate, pubescent, glandular, brownish. Leaves opposite, petiole 3–5.5 mm long., blade 3–5.5 × 1–2 cm, oval-lanceolate, membranaceous, apex acute to attenuate, base rounded to cuneate, margin serrate-dentate to denticulate, flat, adaxial surface sparsely setose, abaxial surface setose, acrodromous, midrib setose. Capitula arranged in inflorescence corymbiform terminal, branches pubescent, glandular, peduncle 5–8 mm long.; involucre cylindrical, imbricate, ca. 13 × 3.5 mm long.; bracteole oblanceolate, ca. 4.5 × 1.2 mm, setose, glandular, apex acute; involucral bracts ca. 30, 7-seriate, 1–3 stria longitudinal olivaceous to brown, glabrescent, caducous; outer

and intermediate oblong, 3–6 × 2.5 mm, apex rounded, sparsely ciliate; inner linear, 6.5–7 × 1–1.5 mm, apex obtuse a cuneate; receptacle convex, epaleaceous, setose. Flower ca. 22–26, corolla funeiform, glabrous, tube ca. 5 mm compr., lobe lanceolate, erect, papilose; apical anther appendage, base obtuse; branches stylar cylindrical, papilose, glabrous, base cylindrical, glabrous. Cypsela narrow-prismatic, ca. 4 mm long., 5-ribbed, ribs setose, carpopodium symmetric or asymmetric. Pappus bristly, cream, ca. 5 mm long., bristly free.
Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, V.2004, fl. and fr., *L.S. Leoni 5742* (GFJP).

The species is not exclusive to Brazil and has a wide distribution in all Brazilian biomes. In the study area, often occurs in an anthropized environment, growing next to roads. Flowering and fruiting in May.

Chromolaena maximilianii can be recognized by pubescent branches, membranaceous leaves, capitula with greenish to cream, obtuse to rounded, and strongly adpressed involucral bracts, with the presence of olivaceous to brownish longitudinal striae. This species is commonly confused with *C. odorata* (L.) R.M.King & H.Rob. since both have the same shape and color of the involucral bracts. However, it differs from *C. maximilianii* mainly because of its decumbent habit and narrower leaves with a glandular abaxial face (Esteves 2001).

Chromolaena porphyrolepis is a species that occurs in the park and is similar to *C. maximilianii*, but this species presents capitula with inner and intermediate involucral bracts with deflexed apex (*vs*. adpressed apex) and cartaceous leaves (*vs*. membranaceous leaves).

5.3. *Chromolaena pedalis* (Sch. Bip. *ex* Baker) R.M.King & H.Rob. Phytologia 20(3): 204. 1970.

Herbs or subshrubs, ca. 0.3 m tall.; branches cylindrical, striate, pubescent to pilose, glandular. Leaves alternate, sometimes opposite, petiole ca. 1.5 mm long., blade 1.2 × 0.9–2 cm, ovate to elliptical, membranaceous, apex cuneate to obtuse, base cuneate to rounded, margin dentate, pilose, flat, both surfaces setose, densely glandular punctate, acrodromous, midrib pubescent. Capitula arranged in inflorescence corymbiform, branches pubescent, glandular-punctate, peduncle 5–14 mm long.; involucre cylindrical, imbricate, 7–10 × 2–3 mm; bracteole ovate to linear, densely glandular-punctate, apex cuneate, margin ciliate; involucral bracts ca. 20, 7-seriate, 3 stria longitudinal olivaceous to brown, glabrescent, margin ciliate; outer ovate or broad-ovate to orbicular, ca. 1.8 × 1 mm, apex obtuse to rounded, pubescent, glandular-punctate; inner oblanceolate, ca. 5 × 0.5 mm, caducous, apex cuneate, densely glandular-punctate; receptacle convex, epaleaceous, shortly setose. Flowers 10–14, corolla narrow-funeiform, tube ca. 4.5 mm long., glandular, lobes lanceolate, deflexed, glandular-punctate; apical anther appendage lanceolate, base obtuse; stylar branches cylindrical, lilac, papilose, sometimes pilose, base cylindrical, glabrous. Cypsela prismatic, ca. 3.5 mm long., 5-ribbed, glabrous, ribs setose, carpopodium symmetric, setose. Pappus bristly, cream, 4–4.5 mm long., bristles free.
Selected material: ESPÍRITO SANTO: Pedra Menina, Casa Queimada, fl., *C.G. Viana & B.V. Tinti 196* (HUEMG, HUFU). MINAS GERAIS: Macieira, 14.V.2016, fl., *L.S. Leoni & I.T.F.V. Lopes 10138* (HUFU).

The species is exclusive to Brazil, with occurrence in the states of Goiás, Minas Gerais, Rio de Janeiro and São Paulo. In the PNC is frequently found in mountain highlands, transition areas of forest and grassland, and rocky environments at 1,700–2,400 m. Flowering from February to May, and fruiting from July to September.

Chromolaena pedalis is characterized by branches with opposite and alternate leaves, and mainly by a glandular-punctate involucre, involucral bracts with vinaceous apex, and terminal capitulescence formed by 3–5 capitula predominantly pedunculate, with capitula formed of 10–14 flowers.

5.4. *Chromolaena porphyrolepis* (Baker) R.M.King & H.Rob. Phytologia 20: 205. 1970.
Fig. 4d-e

Subshrubs, 0.8 m tall.; branches cylindrical, striate, pubescent. Leaves opposite, petiole 4.5–5 mm long., blade 5–11 × 0.7–2 cm, narrow ovate to lanceolate, cartaceous, apex acute to attenuate, base cuneate to asymmetric, margin entire to sparsely serrate, revolute, adaxial surface scabrous-strigose, slightly rugose, abaxial surface glabrous, glandular-punctate, acrodromous, veins scabrous-setose. Capitula arranged in inflorescence corymbiform, terminal, branches pubescent to setose, glandular-punctate, peduncle 4–5 mm long.; involucre cylindrical, imbricate, ca. 13 × 3 mm; bracteole narrow-elliptical, ca. 4 × 1 mm, setose, glandular-punctate, apex acute, margin ciliate;

involucral bracts ca. 32, 7–8 seriate, glabrescent, 1–3 stria longitudinal green to brown, sometimes apex fimbriate, margin ciliate; outer ovate, ca. 4.5 × 2.5 mm long., apex cuneate, pilose; inner linear, ca. 9 × 0.8 mm long., apex rounded or cuneate-mucronate, caducous; receptacle flat to slightly convex, epaleaceous, glabrous. Flowers 22–24, corolla tubulose, glabrous, tube ca. 5.5 mm long., lobes triangular, erect to deflexed, papilose; apical anther appendage lanceolate, base rounded; stylar branches cylindrical, papilose, glabrous, base cylindrical, glabrous. Cypsela prismatic, ca. 4 mm long., 5-ribbed, ribs setose, carpopodium asymmetric or symmetric. Pappus bristly, ca. 5 mm long., bristles free or partially conated at the base. **Selected material**: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, road Paraíso/Portaria Pedra Menina, 13.IX.2017, fr., *I.T.F.V. Lopes et al. 239* (HUEMG, HUFU). MINAS GERAIS: Espera Feliz, Caparaó National Park, 14.V.2016, fl., *L.S. Leoni & I.T.F.V. Lopes 10140* (HUFU).

The species is exclusive to Brazil and to the Atlantic Forest biome, with records only for Espírito Santo, Minhas Gerais and Rio de Janeiro states. It occurs in Montane Semideciduous Forest and Dense Ombrophilous Forest. In the study area, it occupies areas of transition between forest and grassland, forest and road edges, and access trails to the park, at 1,249m above sea level. Flowering from March to May and fruiting in September.

Chromolaena porphyrolepis can be identified by narrow ovate to lanceolate, cartaceous leaves, scabrous-strigose adaxial surface, and involucre presenting intermediate involucral bracts with deflexed apex.

In the PNC, this species is similar to *C. maximilianii*, but it can be differentiated by an entire to sparsely serrate, revolute foliar margin, cartaceous leaves, adaxial foliar surface, glandular-punctate and intermediate bracts of the involucre with cuneate to deflexed apex (*vs.* serrate margin, non-revolute, membranaceous, adaxial surface eglandular and adpressed involucral bracts with obtuse to rounded apex in *C. maximilianii*).

6. *Dasycondylus platylepis* (Baker) R.M.King & H.Rob. Phytologia 24: 190. 1972. Fig. 4f

Herbs, ca. 1.5 m tall; branches partially flattened, striate, pubescent, sparsely gladular-punctate. Leaves opposite, with petiole 10–70 mm long., blade 4.5–10 × 2–5 cm, apical lanceolate to narrow lanceolate-deltoid or deltoid, membranaceous, apex attenuate, base truncate, slightly decurrent, margin double-serrate, dentate, ciliate, flat, adaxial surface glabrous to sparsely setose, sparsely glandular-punctate, face abaxial setose, densely glandular-punctate, eucamptodromous, veins setose to pubescent. Capitula arranged in inflorescence corymbiform, branches sericeous-tomentose, peduncles 5–38 mm long.; involucre campanulate, subimbricate, 12–16 × 8–17.5 mm; subinvolucral bracts oval-lanceolate, ca. 2.5 × 2 mm, leafly, tomentose, glandular-punctate, apex acute to attenuate; involucral bracts ca. 24, 3-seriate, membranaceous, glabrescent, ca. 7–8 stria longitudinal, margin ciliate; outer bracts oblong, ca. 2 × 0.5 mm, apex cuneate; inner bracts oblong to linear, 5.5 × 0.5–1 mm, apex cuneate to acute; receptacle slightly convex, epaleaceous, glabrous. Flowers ca. 40, corolla narrow-funeiform, outer glabrous, inner pilose, tube ca. 3.5 mm long., base slightly enlarged, lobes triangular, papilose, erect, glandular-punctate; apical anther appendage ovate, base truncate; stylar branches cylindrical, slightly claviform claviform, papilose, glabrous, base cylindrical, glabrous. Cypsela shortly prismatic, ca. 1.5 mm long., 5-ribbed, apex setose, base sparsely setose or glabrous, carpopodium conspicuous, procurrent on base of cypsela ribs, asymmetric. Pappus bristle, 2.5 mm long, bristles free.

Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, Vale Verde, 16.II.2000, fl., *V.C. Souza et al. 23183* (ESA, GFJP, HUFU).

The species is exclusive to Brazil, with confirmed occurrence only for the state of Goiás, in the Cerrado biome. Thus, it represents a new occurrence of geographic distribution for the Atlantic Forest biome, and for the state of Minas Gerais (BFG 2018). In the park, this species occurs in Alluvial Semideciduous Forest, along the Caparaó river. Flowering is in February.

Dasycondylus platylepis can be easily recognized from other similar species by large (4.5–10 × 2–5 cm) and membranaceous leaves with truncate base and slightly decurrent to petiole, long petiolate (10–70 mm), capitula distinctly pedunculated (5–38 mm long.) with leafy subinvolucral bracts (*vs.* cuneate base and short-pedunculate capitula). The bulbose and hirsute stylar base was not observed in this specimen, which is one of the diagnostic traits of the genus. Nonetheless, other morphological characteristics confirmed its position in *Dasycondylus*, such as carpopodium procurrent on the base of cypsela ribs (King & Robinson 1987).

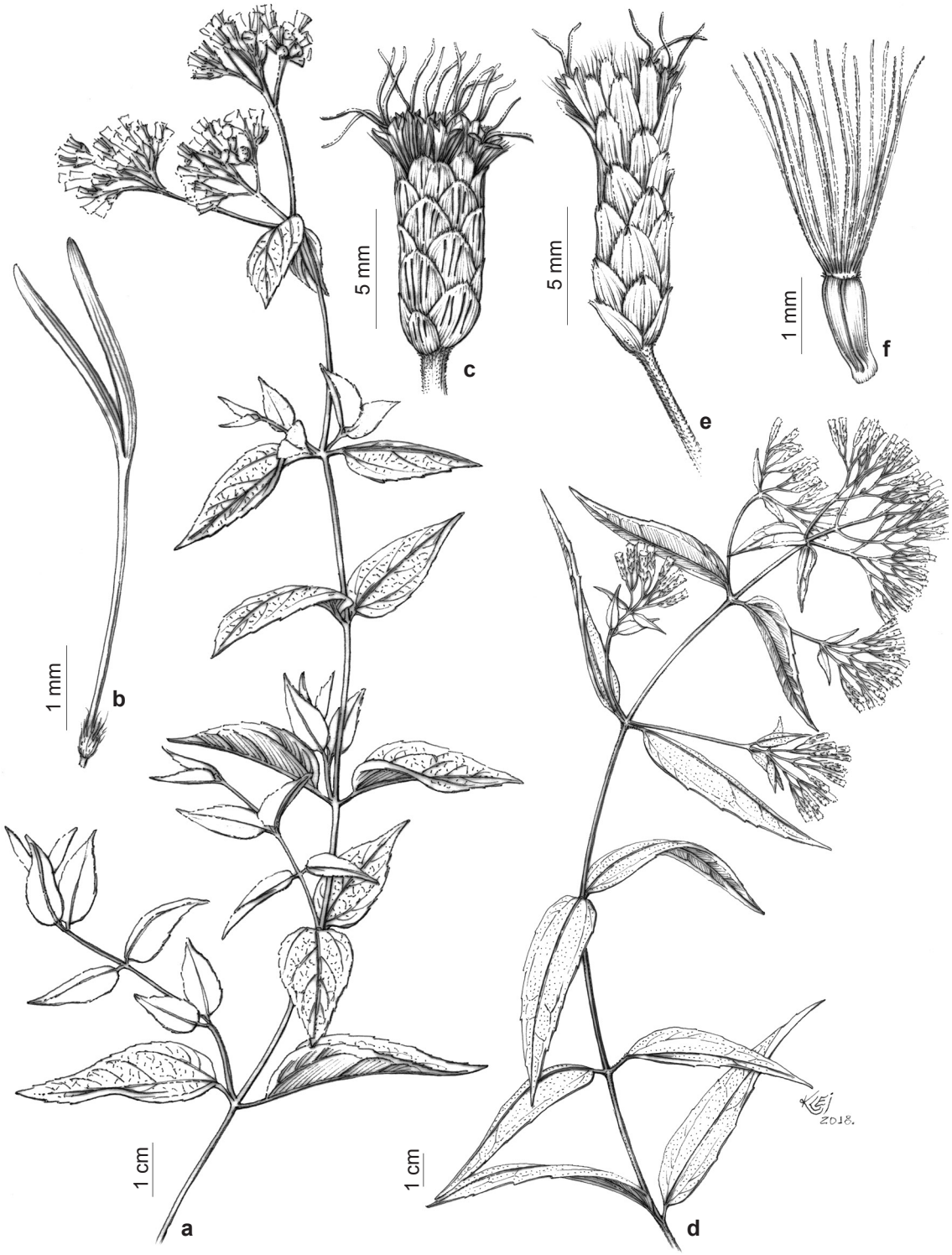

Figure 4 – a-b. *Austroeupatorium neglectum* – a. flowery branch; b. style with a pubescent base. c. *Chromolaena maximilianii* – capitulum. d-e. *Chromolaena porphyrolepis* – d. flowery branch; e. capitulum. f. *Dasycondylus platylepis* – cypsela, procurrent carpopodium, and pappus. (a-b. *Leoni et al. 10139*; c. *Leoni 5742*; d-e. *Lopes et al. 239*; f. *Souza et al. 23183*).

7. ***Fleischmannia remotifolia*** (DC.) R.M.King & H.Rob. Phytologia 19: 205. 1970.

Herbs decumbent, ca. 0.3 m tall; branches striate, glabrous to sparsely pubescent. Leaves opposite, petiole 9–29 mm long., pubescent, blade 3–5.5 × 1–2.8 cm, ovate to oval-lanceolate, membranaceous, apex acute to attenuate, base rounded, cuneate or asymmetric, margin crenate-dentate or serrate, flat, adaxial surface sparsely strigose, abaxial surface sparsely strigose, glandular-punctate, camptodromous, veins sparsely strigose. Capitula arranged in inflorescence corymbiform terminal, branches densely pubescent, peduncle ca. 2.2 mm long.; involucre campanulate, subimbricate, ca. 5.1 × 5.5 mm; involucral bracts ca. 19, 4-seriate, pilose, membranaceous, margin hyaline; outer bracts ovate, ca. 1.6 × 1 mm, apex attenuate; inner bracts oblong to oblanceolate, 4.1 × 1.1 mm, apex rounded, fimbriate; receptacle flat, epaleaceous, glabrous. Flowers ca. 26, corolla narrow infundibuliform, tube ca. 0.8 mm long, glabrous, limb ca. 2.5 mm long, lobes triangular, erect, pilose, densely papilose; apical anther appendage ovate, base obtuse, branches stylar claviform, dense papilose, base cylindrical, glabrous. Cypsela shortly prismatic, ca. 1.1 mm long., 5-ribbed, glabrous, carpopodium conspicuous, symmetric. Pappus bristly, ca. 3.2 mm long., bristle free.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, camping Casa dos beija-flores, 13.IX.2017, fl. and fr., *I.T.F.V. Lopes et al. 242* (HUEMG, HUFU); estrada da Casa dos beija-flores a Macieira, 20º29'30.4"S, 41º49'17.2"W, 1,605 m, 14.IX.2017, fl., *I.T.F.V. Lopes et al. 243* (HUEMG, HUFU).

The species is exclusive to Brazil, occurring in the states of Bahia, Ceará, Espírito Santo, Goiás, Mato Grosso, Minas Gerais, Rio de Janeiro, Santa Catarina and São Paulo. In the PNC, it occurs at the edges of forests and trails, at 1,605 m above sea level. It blooms and fruits in September.

Fleischmannia remotifolia is characterized by decumbent habit, oval to oval-lanceolate and membranaceous leaves, corymbiform capitulescence, capitula with 26 flowers, white to cream glabrous corolla, papilose and externally setose lobes. Receptacle is flat with small scars on carpopodium insertion.

8. ***Grazielia gaudichaudiana*** (DC.) R.M.King & H.Rob. Phytologia 23: 306. 1972.

Shrubs, ca. 1.7 m alt.; ramos cylindrical, striate, densely pubescent. Leaves decussate, concentrated in the lower portion of the branches, apical alternate, petiole ca. 2.5 mm long., blade 2.8–4.4 × 0.6–1.5 cm, elliptical to narrow elliptical, cartaceous, apex acute, base acute to cuneate, margin serrate a double serrate, sparsely pubescent, flat, adaxial surface glabrous, abaxial surface pubescent to pilose, glandular-punctate, eucamptodromous, midrib pubescent. Capitula arranged in inflorescence corymbiform terminal, branches densely pubescent, peduncle 0.5–2 mm long.; involucre cylindrical, slightly subimbricate, ca. 6 × 3.5 mm; bracteole lanceolate, ca. 5–7 mm long, pubescent, apex acute to attenuate; subinvoluvral bracteole linear, ca. 1.5–2 mm long, sparsely pubescent, apex acute; involucral bracts 10, 3-seriate, 3 stria longitudinal brown, glabrescent to sparsely pubescent; outer bracts linear-subulate, ca. 2 × 0.5 mm, apex acute, sparsely pubescent, ciliate; inner bracts oblong, ca. 3.5 × 1.5 mm, apex cuneate or rounded, densely pubescent to tomentose, fimbriate; receptacle flat, epaleaceous, setose. Flowers 5, corolla slightly funeiform, tube ca. 3 long., glabrous, lobe lanceolate, erect, setose, glandular-punctate; anther setose or glabrous, apical anther appendage obtuse or lanceolate, base obtuse; stylar branches cylindrical, papilose, glabrous, base cylindrical, glabrous. Cypsela prismatic, ca. 1.5 mm long., 5-ribbed, glabrous, carpopodium conspicuous, symmetric. Pappus bristly, ca. 2 mm long., bristles connate at the base.

Selected material: MINAS GERAIS: Espera Feliz, ES road, Caparaó National Park, 20º30'11''S, 41º49'08''W, 1,468 m, 4.III.2010, fl. and fr., *G. Heringer et al. 268* (BHCB); trail Macieira to Cachoeira do Aurélio, 20º28'48"S, 41º49'57"W, 1,841 m, 5.III.2010, fl., *M.O. Bunger et al. 366* (BHCB).

The species is exclusive to Brazil, occuring in the states of Goiás, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. In the PNC, it occurs in mountain highlands, at 1,841 m, having been found on an access trail to the forest formation. Flowering and fruiting are in March.

Grazielia gaudichaudiana can be recognized by brownish to darkish branches, cartaceous and elliptical to narrow-elliptical or lanceolate leaves with reduced dimensions (2.8–4.4 × 0.6–1.5 cm) concentrated in the lower portion of the branches. Abaxial foliar surface is glandular-punctate, involucral bracts of intermediate and inner series with fimbriate apex densely pubescent to tomentose, and glabrous cypsela. In the PNC, it differs from other species with five-flowered capitula (*Symphyopappus myricifolius* and *Campovassouria*

cruciata) by an involucre with outer linear-subulate involucral bracts.

9. *Heterocondylus alatus* (Vell.) R.M.King & H.Rob. Phytologia 49: 5. 1981.

Subshrubs, 0.3–0.4 m alt.; branches cylindrical, striate, pubescent or glabrous, glandular. Leaves decussate, concentrated in the upper portion of the branches, petiole 5–8 mm long., blade 4–14 × 1–4 cm, narrow-elliptical to lanceolate, membranaceous, apex acute, base decurrent, margin serrate, flat, both surfaces sparsely strigose or glabrescent, eucamptodromous, midrib glabrous or pubescent. Capitula arranged in inflorescence paniculiform, generally broad, branches pubescent, densely glandular, peduncle 4.5–10 mm long.; involucre campanulate, subimbricate, 9–15 × 8–13 mm; bracts sub pedunculated linear to oblanceolate, 5–6 mm long., pubescent, glandular; subinvolucral bracts linear, ca. 2.5 mm long., pubescent, glandular; involucral bracts 18–20, 3-seriate, sparsely pubescent, glandular; outer bracts linear, ca. 3 × 0.5 mm, apex acute; inner bracts linear-lanceolate to oblanceolate, ca. 5–7 × 0.5 mm, apex acute to attenuate; receptacle slightly convex, epaleaceous, glabrous. Flowers 22–24, corolla narrow-funeiform, tube ca. 6 mm long., glabrous, lobe triangular, slightly deflexed, papilose; apical anther appendage long-obtuse, base attenuate; branches stylar cylindrical, papilose, glabrous, base enlarged, glabrous. Cypsela narrow-prismatic, base attenuate, ca. 4.5 mm long., 5-ribbed, densely glandular, carpopodium conspicuous, asymmetric. Pappus bristly, ca. 4.5 mm long., bristles free, apex purpuraceous.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, road Casa dos Beija-flores to Macieira, 20º29º30.4"S, 41º49'17.2"W, 1,605 m, 14.IX.2017, fl., *I.T.F.V. Lopes 244* (HUEMG, HUFU). MINAS GERAIS: Alto Caparaó, Caparaó National Park, Vale Verde, 1,300 m, 1.IX.1996, fl., *L.S. Leoni & V.C. Souza 3447* (GFJP, UEC).

The species is exclusive to Brazil, with confirmed occurrence for the states of Bahia, Federal District, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. In the study area, it occurs in the border of Montane Dense Ombrophilous Forest, and in streams next to trails, at 1,300 m above sea level. Flowering occurs in August and September.

Heterocondylus alatus is a morphologically variable species, but can be recognized by generally dense broad paniculiform capitulescence and membranaceous leaves, concentrated in the lower portion of the branches (next to the capitulescence). The foliar blade is decurrent to petiole and cypsela is densely glandular.

10. *Koanophyllon thysanolepis* (B.L.Rob.) R.M.King & H.Rob. Phytologia 32(3): 264. 1975.

Shrubs, 0.7–2 m tall; branches cylindrical, striate, densely pubescent, glandular-punctate. Leaves decussate, concentrated at the apex of the branches, petiole 3–7 cm long., blade 2.5–4.2 × 1.2–3.5 cm, elliptical to long-elliptical or ovate to wide-ovate cartaceous, apex obtuse-mucronate to rounded, base cuneate, obtuse a rounded or truncate, sometimes slightly asymmetric, margin crenate to crenulate, flat, adaxial surface strigose, glandular-punctate, abaxial surface densely tomentose, densely glandular-punctate, broquidrodomous, midribs densely tomentose. Capitula arranged in inflorescence corymbiform, terminal, peduncle ca. 9 mm long.; involucre campanulate, eximbricate, 7–13 × 9–14 mm; bracteoles linear to oblanceolate, ca. 8 mm long., apex cuneate, ciliate, margin ciliate; involucral bracts ca. 15, 2-seriate, linear, 6–8 × 0.8–1 mm long., apex cuneate to acute, fimbriate, ciliate, pubescent, glandular-punctates; receptacle slightly conic, epaleaceous, pubescent, glandular. Flores ca. 70–80, corolla narrow-funeiform, glabrous, tube ca. 2 mm long., sparsely glandular, limb ca. 2 mm long., sparsely glandular, lobes traingular, erect or slightly deflexed, glandular-punctate, apical anther appendage obtuse to oval-lanceolate, base truncate; stylar branches cylindrical or truncate, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 2.5 mm long., 7–8 ribbed, glandular, ribs setose, carpopodium conspicuous, symmetric. Pappus bristly, cream to ferrugineous, ca. 5 mm long., bristles free.

Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, entrance to Cachoeira Bonita, 1,750 m, 25.I.1997, fl., *L.S. Leoni 3612* (GFJP); Cachoeira Bonita (Córrego José Pedro), 20º24'S, 41º50'W, 1,960 m, 16.II.2000, fl., *V.C. Souza et al. 23236* (ESA).

The species is exclusive to Brazil and it is distributed in the states of Minas Gerais, Rio de Janeiro and São Paulo. In the study area, it was collected on the access trails to the waterfalls and at the edge of Montane Semideciduous Forest. Flowering is in January and fruiting in March.

Koanophyllon thysanolepis can be identified by dense pubescent ferrugineous branches,

strongly discolored broad leaves, corymbiform capitulescence, campanulate and eximbricate involucre, involucral bracts with fimbriate apex, and 70–80 flowers per capitulum. Among the species occurring in the PNC, *K. thysanolepis* is the one that presents cypsela 1–8-ribbed (*vs.* 1–3-ribbed in *Adenostemma involucratum* and 5-ribbed in other species).

11.1. ***Mikania additicia*** B.L.Rob. Contr. Gray Herb. 104: 31. 1934.

Vine; branches cylindrical, non-flexuose, striate, pubescent. Leaves opposite, with petiole 7–17 mm compr., blade 2–5 × 0.8–2.9 cm, ovate to deltoid, membranaceous, apex acuminate, base subcordate to cordate, margin crenate-dentate, flat, both surfaces strigose, sometimes setose, abaxial surface glandular-punctate, actindromous, veins setose. Capitula arranged in inflorescence tyrsoid, branches dense pubescent, peduncle ca. 5 mm long.; involucre cylindrical, ca. 5.5 × 1.6 mm; sub peduncle bracteole ca. 1,5 mm long., oval-lanceolate, pubescent, apex acute; subinvolucral bracteole ca. 2.5 mm long., oval, pubescent, apex cuneate; involucral bracts 4, ca. 2.5 × 0.3 mm, linear or oblanceolate, glabrescent, apex cuneate to obtuse or rounded, ciliate; receptacle flat, epaleaceous, glabrous. Flores 4, corolla campanulate, glabrous, tube 0,5–0,9 mm long., glandular-punctate, base enlarged, limb ca. 1.2 mm long., lobes lanceolate, erect, glabrous, externally glandular-punctate; apical anther appendage oval-lanceolate, glabrous, base sagitatte; stylar branches truncate, papilose, base glabrous, cylindrical. Cypsela cylindrical, ca. 1.7 mm long., 5-ribbed, glandular-punctate, carpopodium symmetric. Pappus bristly, white, ca. 1,5 mm long., bristles free, persistent.

Selected material: ESPÍRITO SANTO: Serra do Caparaó, Pico da Bandeira, 2,804 m, 3.III.1959, fl., *H.S. Irwin 2779* (VIC). MINAS GERAIS: Alto Caparaó, Caparaó National Park, 12.V.2009, fl. and fr., *G.D. Colleta et al. 241* (GFJP, SPF).

The species is exclusive to Brazil and occurs in mountain vegetation in the states of Minas Gerais, Rio de Janeiro and Paraná. In the study area, this species occurs in gallery forest, and in transitions of forest and "fields of altitude". Flowering is in April and fruiting in May.

Mikania additicia can be recognized by ovate to deltoid leaves with acuminate apex and subcordate to cordate base, crenate-dentate margin, campanulate corolla with glandular-punctate lobe and glandular-punctate cypsela.

In the PNC, *Mikania cardiophylla* is a similar species due to cordate foliar base and abaxial surface with prominent veins. But, *M. cardiophylla* differs from *M. additicia* by leaves with both surfaces glandular-punctate, foliar margin sparsely denticulate, infundibuliform corolla and pilose and glandular-punctate lobes.

11.2. ***Mikania cardiophylla*** B.L.Rob. Candollea 5: 171. 1934.

Vine; branches cylindrical, non-flexuose, striate, glabrous. Leaves opposite, petiole ca. 12 mm long., blade 2–4 × 1–3.8 cm, cordiform, membranaceous, apex acuminate to attenuate, base cordate, margin sparsely denticulate, flat, adaxial surface setose, both surfaces glandular-punctate, actinodromous, veins glabrous. Capitula arranged in inflorescence thyrsoid, branches sparsely pubescent, capitula congest, peduncles ca. 3 mm long., involucre cylindrical, ca. 7 × 2 mm; subinvolucral bracts ca. 2 mm long., linear, glandular-punctate, apex acute, ciliate; involucral bracts 4, 4.7 × 1.15 mm, oblong or oblanceolate, glandular-punctate, apex rounded or cuneate, ciliate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, tube ca. 2 mm long., sparsely setose, glandular-punctate, limb ca. 2.5 mm long., pilose, lobes triangular, erect, pilose, densely glandular-punctate; apical anther appendage lanceolate, pilose, base sagitatte; stylar branches cylindrical, papilose, pilose or glabrous, base cylindrical, glabrous. Cypsela cylindrical, ca. 2.8 mm long, 5-ribbed, glabrous, ribs glandular-punctate, carpopodium symmetric. Pappus bristly, pinkish to white, ca. 4 mm long., bristles free, persistent.

Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, entrance to Casa dos beija-flores, 20º30'05.5"S, 41º49'08.4"W, 1,421 m, fl. and fr., 15.IX.2017, *I.T.F.V. Lopes & L.S. Ribeiro 250* (HUEMG, HUFU). MINAS GERAIS: Estrada dos Gerais, Serra do Caparaó, 27.IX.1941, fl. and fr., *A.C. Brade 17040* (RB).

The species is exclusive to Brazil, with confirmed occurrence only for the states of Minas Gerais and Rio de Janeiro. Therefore, it represents a new occurrence for the state of Espírito Santo. In the study area, it occurs by the side of roads and at Montane Semideciduous Forest and edges of Dense Ombrophilous Forest, at 1,421 m. It blooms and fruits in September.

Mikania cardiophylla can be identified and differentiated from the other similar species in the PNC by glabrous and brownish-reddish branches,

cordiform leaves with acuminate apex, both surfaces glandular-punctate, sparsely denticulate margin, infundibuliform corolla with densely glandular-punctate lobes.

11.3. ***Mikania conferta*** Gardner. London J. Bot. 4: 119. 1845.

Vine; cylindrical branches, non-flexuose, striate, densely hispid. Leaves opposite, petiole ca. 17 mm long., blade 9–16 × 4.5–5 cm, oblong-ovate, membranaceous, apex acute to caudate, base rounded to subcordate, margin sinuous-denticulate, flat, adaxial surface strigose, abaxial surface hispid-tomentosa, veins densely hispid. Capitula arranged in inflorescence thyrsoid, branches densely hispid; peduncle ca. 4 mm long., involucre cylindrical, ca. 6 × 3 mm; subinvolucral bracts ca. 7.5 mm long., lanceolate, densely hispid, apex caudate; involucral bracts 4, 5 × 1.5 mm, oblong to linear, densely hispid,apex cuneate. Flowers 4, corolla campanulate, glabrous, tube ca. 1.2 mm long., base slightly enlarged, limb ca. 2.6 mm long., lobes lanceolate, slightly introrse; apical anther appendage obtuse or truncate to retuse, pilose or glabrous, base sagitatte; stylar branches cylindrical, papilose, glabrous. Cypsela prismatic, ca. 4.5 cm long., 5-ribbed, glabrous, carpopodium symmetric. Pappus bristly, white, ca. 3.6 mm long., bristles free, persistent.

Selected material: ESPÍRITO SANTO: Ibitirama, Santa Marta, Caparaó National Park, 20º54''14''S, 41º66''72''W, 12.VI.2012, fl. and fr., *H.M. Dias et al. 723* (SPF). MINAS GERAIS: Espera Feliz, Caparaó National Park, Portaria Pedra Menina, road to Macieira, 20º29''24''S, 41º49''20''W, 1,655 m, 4.III.2010, *M.O. Bunger et al. 326* (BHCB).

The species is exclusive to Brazil, occurring only in Minas Gerais and Rio de Janeiro states. With this work, its geographical distribution is extended to the Espírito Santo state. In the study area, it was found in Montane Semideciduous Forest and Montane Dense Ombrophilous Forest, at 1,655 m.

Mikania conferta belonging to subgenus *Cylindrolepis*, section *Hirsutissimae*, whose species are, for the most part, densely pilose (Oliveira 2015). This species can be recognized by oblong-ovate leaves, rounded to subcordate base, blade with broad dimensions (9–16 × 4,5–5 cm), sinuous-denticulate margin, the clear presence of a hispid-tomentose indumentum from branches to involucral bracts, in addition to lanceolate subinvolucral bracts about 7.5 mm long. Flowering and fruiting occur in May.

11.4. ***Mikania elliptica*** DC. Prodr. 7(1): 270. 1838. Fig. 5a

Vine; branches cylindrical, non-flexuose, striate, glabrous to sparsely pubescent. Leaves opposite, petiole ca. 3.5 mm long., blade 2.3–3.7 × 1.2–1.6 cm, elliptical, subcoriaceus, apex obtuse to subrounded, base cuneate, margin entire, revolute, adaxial surface vernicose, abaxial surface glabrous, glandular-punctate, broquidodromous, midrib glabrous. Capitula arranged in inflorescence thyrsoid, branches pubescent; peduncle 1–3 mm long.; involucre campanulate, 5–8 × 2.5–3 mm; sub peduncle bracteole ca. 3.5 mm long., obovate, pubescent, apex rounded; subinvolucral bracteole ca. 1,5 mm long., oblong, glabrescent to pubescent, apex rounded, margin ciliate; involucral bracts 4, ca. 3.5 × 0.8 mm, narrow-oblong to linear, pubescent, apex obtuse to rounded, pubescent, glandular-punctate, margin sparsely ciliate; receptacle flat, epaleaceous, pilose. Flowers 4, corolla infundibuliform, pilose, tube ca. 1 mm long., glandular-punctate, limb ca. 3 mm long., lobe triangular, pilose, glandular-punctate; apical anther appendage obtuse to retuse, glabrous, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 4 mm long., densely pubescent, 5-ribbed, glandular-punctate, carpopodium indistinct. Pappus bristly, white, ca. 3.5 mm long., bristles free, persistent.

Selected material: MINAS GERAIS: Caparaó National Park, Vale Verde to Tronqueira, 1.V.1988, fl. and fr., *L. Krieger 22303* FPC *47* (CESJ, HUFU, UEC).

The species is exclusive to Brazil, e had been registered only in the state of Bahia, occurring in the Caatinga and Cerrado biomes (BFG 2018). With this study, the distribution of the species is now extended to the Atlantic Forest biome in Minas Gerais state. At PNC it occurs at the edges of Montane Semideciduous Forest. It blooms and fruits in May.

Mikania elliptica is characterized and distinguished from other similar species in the PNC by elliptical, subcoriaceous leaves with vernicose adaxial surface, obtuse to subrounded apex, revolute margin, setose and glandular-punctate corolla, and densely pubescent cypsela. The species can still be characterized by dense thyroid conflorescence and can present flowers with glabrous corolla and without glandular punctuation (Gandara & Roque 2020).

11.5. ***Mikania glomerata*** Spreng. Syst. Veg. 3: 421. 1826.

Vine; branches cylindrical, non-flexuose, striate, glabrous. Leaves opposite, petiole 19–33 mm long., blade 5.7–8.8 × 2.7–4.1 cm, lanceolate-hastate, 4-lobate, cartaceous, apex acute to cuspidate, base truncate, margin sinuous, both surfaces glandular-punctate, actinódroma, veins glabrous. Capitula sessile, arranged in inflorescence glomeruliform, branches pubescente; involucre cylindrical, ca. 7 × 4 mm; subinvolucral bracteole ca. 3 mm long., linear, pilose, apex acute, setose, margin ciliate; involucral bracts 4, ca. 3 × 1 mm, oblong to oblanceolate, setose, sparsely glandular-punctate, apex obtuse to rounded, pubescent, margin ciliate; receptacle flat, epaleaceous, pilose. Flowers 4, corolla infundibuliform, tube ca. 1 mm long, glabrous, limb ca. 3 mm long., lobes triangular, erect, sparsely pilose, glandular-punctate; apical anther appendage oval-lanceolate, glabrous, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 2.8 mm long., 5-ribbed, sparsely setose, carpopodium symmetric. Pappus bristly, cream, ca. 3.5 mm long., bristles free, caducous.

Selected material: MINAS GERAIS: Caparaó National Park, road to Tronqueira, 20.XI.1988, fr., *L. Krieger 23246* FNC 578 (ESA, UEC).

Additional material: BRAZIL. PARANÁ: Paranavaí, bosque da cidade, 18.VIII.1999, fl. and fr., *G. Hatschbach & J.M. Silva 69272* (HUFU).

The species is not exclusive to Brazil. In the study area, it was collected in an ecotonal region, which corresponds to a transition between montane forests and mountain highlands. Flowering is in August and fruiting occurs in November.

Mikania glomerata is characterized and easily distinguished from other species in PNC by lanceolate-hastate 4-lobed leaves, and sessile capitula grouped in glomerule. It is also characterized by the fleshy-leathery leaf blade and corolla with lobes measuring about 0.3 mm in length (Gandara & Roque 2020).

11.6. ***Mikania hirsutissima*** DC. Prodr. 5: 200. 1836.

Vine; branches cylindrical, non-flexuose, striate, densely hirsute. Leaves with petiole 14–81 mm long., blade 4–14.8 × 1.5–10 cm, oval-cordiform, membranaceous, apex attenuate to caudate, base generally cordate, sometimes truncate, margin denticulate, flat, adaxial surface setose, abaxial surface densely setose to hirsute, actinodromous, veins hirsute. Capitula arranged in inflorescence racemose, branches hirsute, peduncle ca. 1.5 mm long.; involucre campanulate, ca. 6 × 3 mm; subinvolucral bracteole, sub pedunculated ca. 2.5 × 0.5 mm, ovate to oval-lanceolate, glabrescent, apex acute to attenuate, glabrous or hirsute, margin ciliate; involucral bracts 4, stria longitudinal brown, ca. 6 × 1.5 mm, lanceolate, glabrous, apex acute to attenuate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla campanulate, tube ca. 2 mm long., glabrous, limb ca. 1.5 mm long., lobes lanceolate, erect, papilose, setose; apical anther appendage ovate to lanceolate, glabrous, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 2.5 mm long., 5-costate, glabrous, carpopodium symmetric. Pappus bristly, white, ca. 4 mm long., bristly free, persistent.

Selected material: MINAS GERAIS: Alto Caparaó, Caparaó Caparaó National Park, road between housing and Vale Verde, 1.IX.1996, fl., *V.C. Souza et al. 12086* (ESA, HUFU).

The species is not exclusive to Brazil and in the study area it occurs in Montane Semideciduous Forest. Flowering is in September. In semideciduous forests in the state of Bahia, the species blooms from July to October (Gandara & Roque 2020).

Mikania hirsutissima can be recognized by hirsute indumentum present in branches, abaxial foliar surfaces and capitulescences. Moreover, capitula possess involucre with glabrous and lanceolate bracts and acute apex. *Mikania lanuginosa* is a species related to *M. hirsutissima*, but *M. lanuginosa* differs by white lanuginose branches, sense-lanuginose abaxial surface, oblong involucral bracts with obtuse to rounded apex and flowers with glabrous lobes (*vs.* lobes setose).

11.7. ***Mikania lanuginosa*** DC. Prodr. 5: 201. 1836.

Vine; branches cylindrical, non-flexuose, striated, densely white lanuginose. Leaves opposite, with petiole 8–25 mm long., blade 3.5–8 × 2.0–5.5 cm, cordiform, membranaceous, apex acute to attenuate, base cordate, margin denticulate, flat, adaxial surface pilose, abaxial surface densely white lanuginose, actinodromous, veins lanuginose. Capitula arranged in inflorescence tyrsoid, branches lanuginose, peduncle 2.5–3 mm long; involucre cylindrical to campanulate, 5.5 × 3 mm; subinvolucral bracts, sometimes located in the median portion of the peduncle, 1.5–2.5 mm long., oval-lanceolate, glabrescent or sparsely pubescent, apex acute to attenuate, margin ciliate; involucral

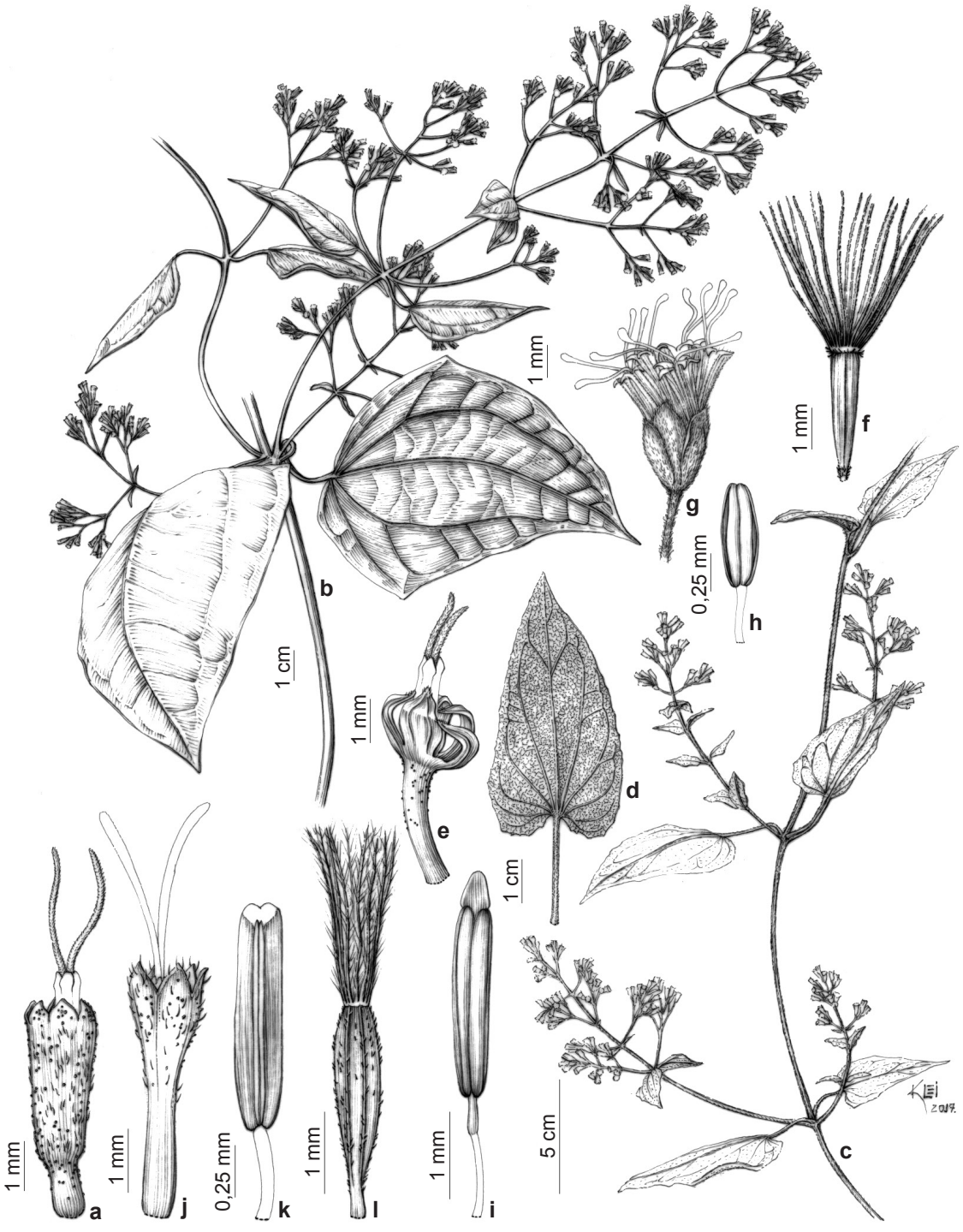

Figure 5 – a. *Mikania elliptica* – infundibuliform corolla. b. *Mikania populifolia* – flowery branch. c-e. *Mikania salviifolia* – c. flowery branch; d. leaf, abaxial view; e. campanulate corolla. f. *Neocabreria pennivenia* – cypsela and pappus. g-h. *Ophryosporus freyreysii* – g. capitulum; h. anther without appendage. i. *Symphyoappus myricifolius* – anther, lanceolate appendage. j-l. *Trichogoniopsis adenantha* – j. corolla; k. anther, retuse appendage; l. cypsela and pappus. (a. *Krieger 22303*; b. *Leoni 3431*; c-e. *Lopes et al 238*; f. *Souza et al. 23768*; g-h. *Leoni 7781*; i. *Lopes et al. 245*; j-l: *Leoni et al. 5253*).

bracts 4, 3.5 × 0.8 mm, oblong, narrow-oblong or linear, glabrous, apex obtuse to rounded or cuneate, margin ciliate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla campanulate, tube ca. 1 mm long., sparsely setose or glabrous, limb ca. 1.5 mm long., lobes lanceolate, erect, slightly introrse, glabrous; apical anther appendage lanceolate, glabrous, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 2 mm long., 5-ribbed, glabrescent, apex sparsely pubescent, carpopodium symmetric. Pappus bristles, white, 2,5–3 mm long., bristles free, persistent.
Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, Macieira, *C.G. Viana et al. 167* (HUEMG). MINAS GERAIS: Alto Caparaó, Caparaó National Park, Vale Verde, 5.IV.1996, fl., *L.S. Leoni 3266* (GFJP).

Although not exclusive to Brazil, this species presents here a new occurrence record for the states of Minas Gerais and Espírito Santo, with confirmed records for the Atlantic Forest in the Southeast (Rio de Janeiro, São Paulo) and South (Paraná, Santa Catarina) regions (BFG 2018). At PNC it was collected at the edges of montane forests and next to rock formations. It blooms from March to May and fruits in May.

Mikania lanuginosa is characterized by dense lanuginose branches and discolor cordiform leaves with denticulate margin and small capitula with glabrous involucral bracts of obtuse to rounded or cuneate apex.

11.8. ***Mikania malacolepis*** B.L.Rob. Contr. Gray Herb. 104: 40. 1934.

Vine; branches cylindrical, flexuose, striate, velutinous-tomentose. Leaves with petiole ca. 8–42 mm long., blade 6–12 × 3–7.5 cm, ovate to broad-ovate, membranaceous, apex acuminate to attenuate, base rounded to subcordate, margin entire, flat, adaxial surface pilose, abaxial surface densely velutinous-tomentose, actinodromous, veins velutinous. Capitula arranged in inflorescence thyrsoid, branches densely tomentose, peduncle ca. 1.8 mm long.; involucral cylindrical, ca. 6 × 2 mm; subinvolucral bracteole ca. 3.5 mm long., ovate to oblong to orbicular, velutinous-tomentose, apex cuneate to obtuse or rounded; involucral bracts 4, ca. 4.8 × 1.5 mm, outer oblong, inner linear, densely velutinous-tomentose, apex cuneate to obtuse, sparsely glandular-punctate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, tube 0.5–1 mm long., sparsely setose or glabrous, limb 2–2.5 mm long., glabrous, lobes lanceolate, erect, sparsely setose or glabrous; apical anther appendage ovate or lanceolate, glabrous, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 4 mm long., 5-ribbed, apex and base setose to pilose, carpopodium symmetric. Pappus bristly, cream, ca. 4 mm long., bristles free, caducous.
Selected material: MINAS GERAIS: Caparaó National Park, Alto Caparaó, road between the municipalities of Alto Caparaó and Caparaó, 20.X.2012, fl. and fr., *T.B. Flores et al. 1313* (ESA, HUFU, UEC).

The species is exclusive to Brazil, and is distributed in the states of Minas Gerais and Distrito Federal. It represents the first occurrence record for *Mikania malacolepis* in the Atlantic Forest biome, since all previous records had been collected in the Cerrado biome (BFG 2018). Both flowering and fruiting occur in October.

Mikania malacolepis differs from other *Mikania* species in PNC by dense velutinous-tomentose in branches, abaxial foliar surfaces, and involucral bracts. According to Contro & Nakima (2017), the species can also be characterized by presenting capitula grouped in opposite ways and subinvolucral bract with sericeus adaxial face.

11.9. ***Mikania nodulosa*** Sch.Bip. *ex* Baker *Fl. bras.* (Martius) 6(2): 235. 1876.

Vine; branches cylindrical, non-flexuose, striate, glabrous or pubescent. Leaves decussate, petiole ca. 8.47 mm long., pubescent, blade 6.4 × 2.5–2.8 cm, ovate or elliptical, membranaceous to cartaceous, apex acuminate, base cuneate or obtuse to rounded, margin sparsely denticulate, slightly revolute, both surface glabrous or sparsely shortly setose with abaxial surface glandular-punctate, acrodromous, veins glabrous. Capitula arranged in inflorescence corymbiform, branches ascendent, densely pubescent, peduncle ca. 2 mm long., slightly pubescent; involucre cylindrical-campanulate, ca. 10 × 3.2 mm; subinvolucral bracteole, sub peduncle 2.6–5 mm long., elliptical-lanceolate to oval-lanceolate, glabrous, apex acute, glabrous, sometimes pilose; involucral bracts 4, ca. 6.2 × 1 mm, oblanceolate, glabrous, apex cuneate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, glabrous, tube ca. 1.1 mm long., base slightly enlarged, limb ca. 2.7 mm long., glandular-punctate, lobes triangular, introre, papilose; apical anther appendage ovate, glabrous or shortly pilose, base obtuse; stylar branches cylindrical, papilose, sometimes shortly pilose, base cylindrical, glabrous. Cypsela prismatic,

ca. 5 mm long., 5-ribbed, glabrous, carpopodium symmetric. Pappus bristles, white, ca. 4.5 mm long., bristle free, persistent.
Selected material: ESPÍRITO SANTO: Dores do Rio Pedro, Caparaó National Park, trail to Cachoeira do Aurélio, 20º28'51.3"S, 41º50'7.5"W, 1,849 m, 15.IX.2017, fl. and fr., *I.T.F.V. Lopes et al. 256* (HUEMG, HUFU). MINAS GERAIS: Alto Caparaó, Caparaó National Park, way to Macieiras, 12.V.2009, fl., *G.D. Colletta et al. 196* (ESA).

The species is exclusive to Brazil, with confirmed occurrences for the states of Bahia and Minas Gerais. With this work, its geographical distribution is extended to the state of Espírito Santo. In the study area, it was collected at the edge of Montane Ombrophilous Forest, at 1,849 m. It blooms and fruits in September.

Mikania nodulosa is characterized by cream pubescent branches, ovate to elliptical membranaceous leaves, with glandular-punctate abaxial surface, 10-mm long involucre, infundibuliform and glandular-punctate corolla, and long-prismatic and glabrous cypsela.

11.10. ***Mikania nummularia*** DC. Prodr. 5: 188. 1836.

Herbs or shrubs, ca. 0.5 m tall; cylindrical branches, non-flexuose, striate, tomentose. Leaves decussate, petiole 1.9–2.8 mm long., blade 1.5–2 × 1 cm, ovate to orbicular, cartaceous, apex obtuse-mucronate, base base rounded to subcordate, margin denticulate to crenate, flat, both surfaces sericeous-tomentose, actinodromous, veins reticulate. Capitula arranged in inflorescence corymbiform, branches densely tomentose; pecuncle ca. 1.5 mm long.; involucre cylindrical, ca. 4.5 × 3 mm; sub peduncle bracteole, ca. 2 mm long., narrow-oblong to linear, densely tomentose, apex cuneate; involucral bracts 4, ca. 2.5 × 1 mm, oblong to obovate, densely tomentose, apex obtuse to rounded; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, tube ca. 1 mm long., glabrescent, glandular-punctate, limb ca. 1.5 mm long., glabrous, lobes triangular, erect, tomentose, glandular-punctate; apical anther appendage oval-lanceolate, glabrous, base sagitatte; stylar branches truncate to cylindrical, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 1 mm long., 5-ribbed, glabrous, glandular-punctate, carpopodium symmetric. Pappus bristly, white, ca. 2 mm long., bristles free, persistent.
Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, Pico da Bandeira, close of Caparaó, 1,500–1,600 m, 6.IX.1977, fl., *G.J. Shepherd et al. 5781* (RB). Tronqueira, 1,980 m, VIII.2008, fl., *L.S. Leoni 7198* (GFJP, UEC).

The species is exclusive to Brazil and occurs in the states of Goiás, Federal District, Minas Gerais, Paraná, Rio de Janeiro and São Paulo. In the study area, the species occurs in mountain highlands, at 1,500–1,980 m. It blooms from August to September.

Mikania nummularia can be identified by its herbaceous to subshrubby habit, up to 0.5 m tall, oval to orbicular decussate leaves, abaxial surface with non-prominent reticulate venation, short-peciolate and corymbiform capitulescence. Among the species in PNC, only *M. nummularia* and *M. sessilifolia* are erect plants, and the latter is characterized by having scabrous adaxial foliar surface and abaxial foliar surface with prominent reticulate venation. Also, *M. sessilifolia* present subshrubby habit above 0.5 m tall and racemose capitulescence.

11.11. ***Mikania populifolia*** Gardner London J. Bot. 5: 485. 1846. Fig. 5b

Vine; branches cylindrical, fistulose, non-flexuose, striate, glabrous, nodes pubescent. Leaves opposite, petiole 18–37 mm long., blade 5–11×2.5–7 cm, ovate to broad ovate-deltoid, cartaceous, apex acuminate, base rounded to subcordate or asymmetric, margin entire, flat, adaxial surface glabrous, abaxial surface sparsely glandular-punctate, actinodromous, veins glabrous. Capitula arranged in inflorescence tyrsoid, branches glabrous, peduncle ca. 3.5 mm long.; involucre cylindrical to campanulate, 5,5 × 3 mm; subpeduncle bracteole ca. 4.5 mm long., lanceolate, apex acute, glabrous, margin ciliate; subinvolucral bracteole ca. 2.5 mm long., ovate to oblanceolate, glabrous, apex cuneate to obtuse, pubescent or glabrous, margin ciliate, involucral bracts 4, oblong, glabrous, apex cuneate to obtuse, pubescent; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, glabrous, tube ca. 0.9 mm long., limb ca. 2 mm long., lobe triangular, erect, pilose; apical anther appendage truncate, base sagitatte; stylar branches truncate, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 2.7 mm long., 5-ribbed, setose or glabrous, glandular-punctate, carpopodium symmetric. Pappus bristly, white, ca. 3.5 mm long., bristles free, caducous.
Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, 3.VIII.1996, fl., *L.S. Leoni 3431* (ESA, GFJP).

Material adicional: BRAZIL. SÃO PAULO: Arujá, BR-116, km 195, 23.VIII.1998, fl. and fr. *C.F. Ruas* (FUEL 21879, HUFU 23135).

The species is exclusive to Brazil, with confirmed occurrence for the Federal District and Minas Gerais state. In the study area, it occurs in Montane Semideciduous Forest. Flowering and fruiting are in August.

Mikania populifolia is characterized by fistulose and glabrous branches with pubescent nodes, ovate to broad ovate-deltoid, glabrous and long-petiolated leaves, infundibuliform corolla with pilose lobes and a glandular-punctate cypsela.

11.12. ***Mikania salviifolia*** Gardner. London J. Bot. 5: 487. 1846. Fig. 5c-e

Vine; branches cylindrical, non-flexuose, striate, pubescent to tomentose, secondary branches divaricate. Leaves opposite, petiole 24–33 mm long.,blade 4–7 × 2–3 cm, narrow-deltoid to deltoid, membranaceous, apex acute, base cordate to hastate, margin erose, flat, adaxial surface setose, abaxial surface densely tomentose, actinodromous. Capitula arranged in inflorescence tyrsoid, branches densely pubescent, peduncle ca. 2.5 mm compr.; involucre cylindrical, 8.5 × 2.5 mm; subinvolucral bracteole 3–3.5 mm long., elliptical to oval-lanceolate, pubescent to tomentose, apex acute, margin ciliate; involucral bracts 4, ca. 4 × 1 mm, oblong to oblanceolate or lanceolate, outer tomentose, inner glabrous, apex acute, pubescent, margin ciliate; receptacle flat, epaleaceous, setose. Flowers 4, corolla campanulate, tube ca. 2.8 mm long., sparsely pubescent, glandular, limb ca. 2 mm long., glabrous, lobes lanceolate, erect, slightly introrse, apex and margin setose; apical anther appendage lanceolate, base sagitate; stylar branches cylindrical, papilose, shortly setose, base cylindrical, glabrous. Cypsela prismatic, ca. 3 mm long, 5-ribbed, glabrescent to sparsely setose, glandular-punctate, ribs scabrous to setose, carpopodium symmetric. Pappus bristly, white, 2.5–3 mm long., bristle free, persistent.

Selected material: ESPÍRITO SANTO: road Paraíso/ Portaria Pedra Menina, 13.IX.2017, fl. and fr., *I.T.F.V. Lopes et al. 238* (HUEMG, HUFU). MINAS GERAIS: Alto Caparaó, Caparaó National Park, between housing and Vale Verde, 1.IX.1996, fl., *V.C. Souza et al. 12085, 12089* (ESA, HUFU).

The species is not exclusive to Brazil, and despite that, it represents a new occurrence for the state of Espírito Santo. In the study area, it occurs at the edges of Montane Semideciduous Forest, Montane Dense Ombrophilous Forest and man-made areas, close to a cultivated lavender field. Flowering and fruiting occur from September to October.

Mikania salviifolia is characterized and differentiated from other similar species in the PNC by narrow-deltoid to deltoid leaves with cordate to hastate base and dense tomentose abaxial foliar leaves.

11.13. ***Mikania sessilifolia*** DC. Prodr. 5: 188. 1836.

Subshrubs, ca. 0.6 m tall; branches cylindrical, non-flexuose, slightly striate, tomentose. Leaves decussate, petiole 2.8–4.5 mm long., blade 1.3–3.2 × 1–2.8 cm, broad-ovate to ovate, coriaceous, apex obtuse-mucronate, base rounded, margin crenate-denticulate, flat, adaxial surface scabrous-strigose, abaxial surface tomentose, glandular-punctate, actinodromous, veins reticulate. Capitula arranged in inflorescence racemose, branches tomentose, capitula sessile or with peduncle ca. 1 mm long.; involucre campanulate, ca. 2.5 × 2.5 mm; subpeduncle bracteole ca. 1.5 mm long., linear, densely pubescent to tomentose, apex cuneate; involucral bracts 4, oblong or linear, densely pubescent to tomentose, apex rounded to cuneate, pubescent to tomentose; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, tube ca. 1.2 mm long., sparsely setose, glandular-punctate, base slightly enlarged, limb ca. 1.8 mm long., glandular-punctate, lobes triangular, erect, pubescent to tomentose, glandular-punctate; apical anther appendage, base truncate; stylar branches cylindrical to truncate, papilose, base cylindrical, glabrous. Cypsela cylindrical, ca. 1 mm long., 5-ribbed, glabrous, glandular-punctate, carpopadium symmetric. Pappus bristly, white, ca. 1.5 mm long., bristles free, persistent.

Selected material: MINAS GERAIS: Caparaó National Park, 2,200 m, 5.VIII.1990, fl. and fr., *L.S. Leoni* (GFJP 1210); Vale Encantado, 2,200 m, 18.VI.1995, fl., *L.S. Leoni 3005* (GFJP).

The species is endemic to Brazil and occurs in the states of Bahia, Federal District, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Santa Catarina and São Paulo, all areas of Cerrado biome. Therefore, it represents a new occurrence record for the Atlantic Forest biome. In the study area, it occurs close to the trails and mountain highlands at 2,200 m.

Mikania sessilifolia can be recognized by having broad-ovate and decussate leaves which, when herborized, are ascendant and imbricate. It presents scabrous-strigose adaxial foliar surface,

and tomentose abaxial surface with prominent reticulate veins. It blooms from June to August and fruits in August.

11.14. ***Mikania stylosa*** Gardner. London J. Bot. 5: 486. 1846.

Vine; branches cylindrical, flexuose, striate, hirsute. Leaves opposite, petiole 8–14 mm long., blade 2.8–8 × 1–2.9 cm, ovate, cartaceous, apex acute to attenuate, base rounded, margin entire slightly serrilate or denticulate, flat, adaxial surface scabrous to sparsely setose, abaxial surface densely setose, actinodromous, veins setose. Capitula arranged in inflorescence thyrsoid, branches pubescent to setose; peduncle ca. 2 mm long.; involucre cylindrical, 8 × 3 mm; subpeduncle bracteole ca. 1.5 mm long., lanceolate or linear, pilose, apex acute, pilose; involucral bracts 4, 3.5 × 1 mm, oblong, glabrescent, apex obtuse to rounded, pubescent to pilose or hirsute, margin ciliate; receptacle flat, epaleaceous, glabrous. Flowers 4, corolla infundibuliform, glabrous, tube ca. 0.8 mm long., base enlarged, limb ca. 2.5 mm long., lobe lanceolate, erect, pilose; apical anther appendage lanceolate, base sagitatte; stylar branches cylindrical, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 3 mm long., 5-ribbed, glabrous, carpopodium symmetric. Pappus bristly, cream, ca. 5.5 mm long., bristles free, caducous.
Selected material: ESPÍRITO SANTO: Iúna, Príncipe, Caparaó National Park, trail to Poço dos Desejos, 12.V.2011, fl., *T.M. Machado et al. 39*4 (SPF). MINAS GERAIS: Espera Feliz, Caparaó National Park, Portaria Pedra Menina, road to Macieira, 20º30'23''S, 41º49'11''W, 1,395 m, 4.III.2010, fl., *M.O. Bunger et al. 309* (BHCB).

The species is exclusive to Brazil, with confirmed geographical occurrence only for the state of Minas Gerais, therefore it represents a new occurrence record for the flora of Espírito Santo State. In the study area, it occurs mainly in Montane Dense Ombrophilous Forest. It blooms from March to May.

Mikania stylosa can be recognized by the flexuose branches, dense hirsute, brownish-reddish to ferrugineous, dense setose abaxial foliar surface with prominent ferrugineous veins and pappus with caducous bristles. In the collected specimens, the strongly indented margin was not verified either in the lower portion of the leaf blade or along its entire length, as shown in the description of the type material (Gardner 1846) (*vs.* entire to slightly serrated or denticulate margin).

12. ***Neocabreria pennivenia*** (B.L.Rob) R.M.King & H.Rob. Phytologia 49: 5. 1981. Fig. 5f

Shrubs, ca. 1.5 m tall.; branches cylindrical, striate, densely pubescent, glandular-punctate. Leaves opposite, petiole ca. 6 mm compr., blade 5.5–11.5 × 1.5–2 cm, narrow-elliptical to lanceolate, cartaceous, apex acute, base attenuate, margin serrilate, both surface sparsely setose to strigose, abaxial surface glandular-punctate, eucamptodromous, midrib pubescent. Capitula arranged in inflorescence densely corymbiform, terminal, branches densely pubescent, sparsely glandular-punctate, peduncle ca. 2 mm long.; involucre cylindrical, ca. 7 × 3 mm; bracteole ca. 2–6 mm long., linear, pubescent, apex acute; subinvolucral bracts ca. 1.5–2 mm long., linear, pubescent, apex acute; involucral bracts ca. 14, 4–5 seriate, 3 stria longitudinal brown, glabrous, apex and margin ciliate; outer bracts ca. 1.5 × 1mm, oblong-ovate, obtuse apex, sparsely glandular-punctate; inner bracts caducous, 6.5 × 2 mm, oblong to oblanceolate, apex obtuse to rounded, glandular-punctate; receptacle flat, epaleaceous, glabrous. Flowers 6 (7–10), corolla slightly funeiform, glabrous, tube 3–4 long., externally glandular or glabrous, internally pilose, lobes lanceolate, erect, glandular-punctate; apical anther appendage lanceolate or retuse, base obtuse; stylar branches cylindrical, papilose, shortly pilose, base cylindrical or slightly enlarged, glabrous. Cypsela prismatic, ca. 2.5 mm long., glabrous, 5-ribbeds, apex and base setose, base shortly stipitate, carpopodium symmetric. Pappus bristly, cream, ca. 3.5 mm long., bristles partially connate at the base, persistent.
Selected material: ESPÍRITO SANTO: Caparaó National Park, Núcleo Pedra Roxa, 970 m, 20º23'48"S, 41º44'0.79"W, 22.II.2000, fl. and fr., *V.C. Souza et al. 23686* (BHCB, ESA, HUFU). MINAS GERAIS: Alto Caparaó, Caparaó National Park, Vale Encantado, 2,000 m, II.1999, fl., *L.S. Leoni 4146* (GFJP, HUFU, UEC).

The species is exclusive to Brazil and occurs in the states of Minas Gerais and Paraná. With this work, its area of occurrence extends to Espírito Santo state. In the study area, it occurs in gallery forest. It flowers and fruits in March.

Neocabreria pennivenia is characterized by densely pubescent branches, narrow-elliptical to lanceolate leaves, eucamptodromous venation, corolla with pilose inner, lanceolate to obtuse apical anther appendage and cypsela with setose apex and base. Among the species of Eupatorieae in PNC, *N. pennivenia* is still distinguished from the other

species due to its strongly caducous intermediate and inner involucral bracts in mature capitula, a characteristic that is easy to see in herborized materials.

13. *Ophryosporus freyreysii* Baker. *Fl. bras.* 6(2): 188. 1876. Fig. 5g-h

Subshrubs to shrubs, subscandent or decumbent, ca. 1–2 m tall.; branches cylindrical, striate, glabrous. Leaves opposite, petiole 3–6 mm long., blade 3–0.4 × 10.5–1.8 cm, lanceolate to narrow-lanceolate, membranaceous, apex acute to attenuate, base cuneate, margin serrate, both surfaces sparsely setose, acrodromous, midrib setose. Capitula arranged in inflorescence tyrsoid, branches cream, divaricate, densely pubescent to tomentose, peduncle ca. 1.5 mm long.; involucre campanulate, 5 × 2.5 mm; subpetuncles bracteole ca. 1.5 mm long., ovate or oblanceolate, setose, apex acute; involucral bracts 5, 2-seriate, ca. 2 × 0.5 mm, oblong, setose, apex cuneate or obtuse to rounded, fimbriate or not, densely setose; receptacle flat, epaleaceous, glabrous. Flowers 5–6, corolla funeiform, tube ca. 1 mm long., glandular, base enlarged, limb ca. 1 mm long., glabrous or sparsely glandular, lobes narrow-triangular, generally erect, sometimes deflexed, glabrous; anther without apical appendage, base obtuse; stylar branches capitate, papilose, base cylindrical, glabrous. Cypsela prismatic, ca. 1.5 mm long., glabrous, 5-ribbed, ribs setose, base setose or glabrous, carpopodium asymmetric. Pappus bristly, white, ca. 2 mm long., bristles free, persistent.

Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, Tronqueira, 1,970 m, 18.IX.1988, fl. and fr., *L. Krieger et al.* FPNC 215 (ESA 72499, CESJ, UEC); road between Alojamento e Vale Verde, 1.IX.1996, fl. and fr., *V.C. Souza 12117*, *12088* (ESA, HUFU).

The species is exclusive to Brazil, occurring in the states of Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo. In the study area, it was collected in an ecotonal area of forests and mountain highlands, in the border of Montane Semideciduous Forest, scattered between individuals of "candeia" (*Eremanthus erytropappus* (DC.) MacLeish - and in mountain highlands). The species Flowering occurs from August to September.

Ophryosporus freyreysii can be recognized by its glabrous branches, lanceolate to narrow-lanceolate leaves with serrate margin, capitula with 5–6 flowers, apical anther appendage absent and capitate stylar branches. The two last traits set it apart from the other Eupatorieae in the park.

14.1. *Stevia camporum* Baker *Fl. bras.* 6(2): 202. 1876.

Herbs, 0.4–0.9 m alt.; branches cylindrical, slightly striate, pubescent to slightly hirsute or dense scariosus. Leaves opposite, petiole ca. 2 mm long., blade 2.5–4 × 0.8–0.17 cm, lanceolate to lanceolate-rhomboid or trulate, membranaceous, patent or ascendent, apex acute, base cuneate, margin crenate-serrate, serrate or double-serrate, both surface sparsely setose, densely glandular-punctate, eucamptodromous. Capitula arranged in inflorescence corymbiform, terminal and/or axilar, branches hirsute or scariosous, densely glandular-stipitate, peduncle 3–9 mm long.; involucre cylindrical, 5–6 × 2 mm; involucral bracts 5, ca. 5 × 0.8 mm, scariosus, linear-lanceolate, hirsute or pubescent, densely glandular-punctate, apex cuneate to acute; receptacle slightly convex, epaleaceous, glabrous. Flowers 5, funeiform, tube ca. 4.5 mm long., glandular-punctate, base slightly enlarged, glandular-punctate, fauce broad, lobes narrow-triangular to lanceolate, deflexed, glandular-punctate, sometimes eglandular, externally and internally hirsute or setose; apical anther appendage lanceolate, base obtuse; stylar branches cylindrical, papilose, setose, base cylindrical, glabrous. Cypsela fusiform, 3–4.5 mm long., 5-ribbed, glabrous or slightly pubescent, ribs setose, carpopodium aneliform, asymmetric. Pappus coroniform or coroniform-aristate, cream, 2 awn serrulate-setose, ca. 4 mm long.

Selected material: ESPÍRITO SANTO: Pico da Bandeira, 1.III.1959, fl., *H.S. Irwin 2749* (VIC). MINAS GERAIS: climb to Pico da Bandeira, 14.VI.1991, fl., *G.M. Hatschbach & D. Guimarães 55450* (RB, SPF).

The species is not exclusive to Brazil, and it is frequent in the study area, occurring at the edges of forests, trails, rocky outcrops and, mainly, in mountain highlands. *Stevia camporum* blooms from January to June and bears fruit from May to September.

Stevia camporum presents herbaceous or subshrubby habit, lanceolate to truncate foliar blade, corymbiform capitulescence and homocarpic or heterocarpic capitula in different specimens. Some specimens presented homocarpic capitula containing cypsela with fimbriate-coroniform pappus, while other specimens presented heterocarpic capitula with coroniform and coroniform-2-aristate pappus.

A similar species that also occurs in the PNC is *S. urticaefolia*. However, the latter presents lax paniculiform capitulescence and homocarpic capitula with all cypsela containing coroniform-paleaceous pappus.

14.2. *Stevia urticaefolia* Thunb. Pl. Bras. Dec. i. 13.

Shrubs, 1.5 m alt.; branches cylindrical, slightly striate, pilose to scarious. Leaves with petiole ca. 2 mm long., blade 2–4 × 0.5–1.2 cm, narrow-elliptical to lanceolate or trulate, membranaceous, patent, apex acute, base attenuate to obtuse, margin crenate-serrate, slightly revolute, both surface sparsely setose, densely glandular-punctate, camptodromous. Capitula arranged in inflorescence paniculiform, branches densely glandular-stipitate, leafly, peduncle ca. 3 mm long.; involucre cylindrical, ca. 7 × 2.5 mm; involucral bracts 5, 5.5 × 1.2 mm, lanceolate, pilose to scarious, dense glandular, apex cuneate to acute, erect or deflexed; receptacle slightly convex, epaleaceous, glabrous. Flowers 5, funeiform, tube ca. 5 mm long., glandular-punctate, base slightly enlarged, limb non-differentiated, fauce broad, lobes narrow-triangular to lanceolate, deflexed, glandular-punctate, densely hirsute or setose; apical anther appendage lanceolate, base obtuse; stylar branches cylindrical, papilose,, base cylindrical, glabrous. Cypsela fusiform, ca. 4.5 mm long., glabrous, 5-ribbed, ribbed setose, carpopodium aneliform, asymmetric. Pappus coroniform-paleaceous, awn absent.
Selected material: ESPÍRITO SANTO: Espera Feliz, Caparaó National Park, Macieira, 27.V.1999, fl., *W. Forster & L.S. Leoni 53* (GFJP, ESA, UEC). MINAS GERAIS: campos altos, road to Tronqueira, 1,760 m, 1.IV.1989, fl., *L. Krieger et al. 23621* FPNC 885 (ESA, CESJ, HUFU, SPF, UEC).

The species is not exclusive to Brazil, however it represents a new record of occurrence for the state of Espírito Santo. In the study area, it was collected in an ecotonal region between forest and mountain highlands at 1,760 m. It flowers from March to June and fruits in September.

Stevia urticaefolia is characterized by subshrubby to shrubby habit, with dense and leafy branches, reduced foliar blades, lax paniculiform capitulescence, and coroniform-paleaceous pappus.

15. *Symphyopappus myricifolius* B.L.Rob. Contr. Gray Herb. 68: 6. 1923. Fig. 5i

Shrubs to treelet, ca. 1.5 m tall.; branched angular, vernicose, sulcate, glabrous or puberule, node with conspicuous leaf scars. Leaves decussate, petiole 4–10 mm long., blade 3.5–7 × 0.8–2.5 cm, elliptical or narrow-elliptical to elliptic-lanceolate, generally ascendent, sometimes patent, cartaceous to subcoriáceous, apex cuneate to acute, base attenuate, slightly decurrent, margin apically ⅔ crenate to crenate-serrate, both surfaces glandular-punctate, broquidrodomous, midribs glabrous. Capitula arranged in inflorescence corymbiform, terminal, branches glabrous or puberule, glandular-punctate, peduncles 5–10 mm long.; involucre cylindrical, sub to eximbricate, ca. 10–12 × 4.5 mm; subinvolucral bracteole ca. 4–6.5 mm long., linear, glabrous, vernicose, apex acute; involucral bracts 12–14, 4–5-seriate, vernicose, 3–4 stria longitudinal darkish, glabrous or sparsely pubescent, margin ciliate; outer bracts 3–4.5 × 1–1,5 mm, oval to oval-lanceolate, generally deflexed, apex acute, sparsely ciliate; inner bracts 7 × 1 mm, narrow-oblong, caducous, apex obtuse to rounded, ciliate, fimbriate; receptacle conic, epaleaceous, pilose or glabrous, alveolate. Flowers 5, corolla tubulose, cylindrical, glabrous, tube 4.5–5.5 mm long., lobes triangular, erect, glandular-punctate or eglandular, internally shortly pilose; apical anther appendage obtuse or oblong-truncate or lanceolate, base obtuse; stylar branches cylindrical or truncate, papilose, pilose or glabrous, base glabrous, cylindrical. Cypsela shortly prismatic, ca. 2.5–3 mm long., vernicose, 5-ribbed, glabrous, carpopodium, symmetric, little conspicuous. Pappus uniseriate or biseriate, bristly, vernicose, ferrugineous, purple spots in few bristles, ca. 4 mm long., bristles connate at the base, unequal or equal in length, persistent.
Selected material: ESPÍRITO SANTO: Dores do Rio Preto, Caparaó National Park, trail of the Casa Queimada to Pedra Duas Irmãs, 20º27'22.4S, 41º48'26.6"W, 2,224 m, 14.IX.2017, fl., *I.T.F.V. Lopes et al. 245* (HUEMG, HUFU). MINAS GERAIS: trail between Terreirão and Pico da Bandeira, 18.III.2014, *V.C. Souza et al. 38107* (ESA, HUFU).

The species is exclusive to Brazil, being considered, so far, exclusive to the Atlantic Forest and southeast region (BFG 2018). It is an endemic species of the PNC, since it occurs only in mountain highlands (2,127–2,260 m).

Symphyopappus myricifolius can be recognized by glabrous, vernicose and sulcate branches. Leaves are concentrated at the apex of the branches, generally ascendant, with an elliptical or narrow-elliptical to elliptic-lanceolate shape, crenate-serrate margin, broquidrodomous venation. Capitula contain 5 flowers with cream to lilac

corolla, lanceolate apical anther appendage and ferrugineous pappus.

16. ***Trichogoniopsis adenantha*** (DC.) R.M.King & H.Rob. Phytologia 24: 181. 1972. Fig. 5j-l

Herbs, ca. 0.5 m tall.; branches cylindrical, slightly costate, densely hirsute to scariosus, glandular. Leaves alternate, petiole 0.5–1.2 cm long., blade 3–5 × 1–1.5 cm, oval to deltoid-lanceolate, membranaceous, apex acute, base truncate to subcordate, sometimes asymmetric, slightly decurrent, margin crenate-dentate, ciliate, adaxial surface pilose, glandular,, abaxial surface pilose, densely glandular-punctate, campilodromous, midribs pilose to hirsute. Capitula arranged in inflorescence corymbiform, branches dense hirsute to scariosus, peduncle 8–14 mm long.; involucre campanulate, subimbricate, 6–9 × 9–10 mm; bracteole ca. 7 mm long., lanceolate, hirsute, apex acute, ciliate; involucral bracts ca. 30, 2–3-seriate, pilose to hirsute, glandular-punctates; outer bracts ca. 4 × 2 mm, elliptical to oblanceolate, apes acute, ciliate; inner bracts ca. 5 × 0.5–1 mm, linear-lanceolate, apex acute, ciliate; receptacle flat, epaleaceous, glabrous, foveolate. Flowers ca. 60–66, corolla infundibuliform, glabrous, tube ca. 3 mm long., base slightly enlarged, limb ca. 1.5 mm long., glandular-punctate, lobes lanceolate, erects, glandular-punctate, glabrous or pilose; apical anther appendage retuse, base rounded; stylar branches claviforme, papilose, base cylindrical, glabrous. Cypsela stipitate, ca. 2.5 mm long., setose, 5-ribbed, carpopodium symmetric. Pappus plumose-setose, white to purplish, ca. 2.5 mm long., bristles free.
Selected material: MINAS GERAIS: Alto Caparaó, Caparaó National Park, 21.II.2003, fl., *L.S. Leoni et al. 5253* (GFJP, HUFU, UEC); Tronqueira, 2010, fl. and fr., *B.V. Tinti & J. Nunes* (VIC 42119).

The species is exclusive to Brazil, occurring in the states of Bahia, Ceará, Espírito Santo, Mato Grosso, Minas Gerais, Paraná, Rio de Janeiro and São Paulo. In the study area, it was collected in ecotonal region between forest and mountain highlands, at 1,970 m. Flowering and fruiting occur in February.

Trichogoniopsis adenantha can be easily recognized and distinguished from the other species of Eupatorieae in the PNC by oval to deltoid-lanceolate leaves with membranaceous and discolor aspect, truncate to subcordate foliar base and capitula arranjed in inflorescence lax corymbiform, presenting 4–5 capitula composed of 60–66 flowers each.

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List of specimens

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