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Flora of Espírito Santo, Brazil

Flora of Espírito Santo: Barnebyoid and Bunchosioid clades (Malpighiaceae)

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Abstract

We present the taxonomic treatment of four genera and six Malpighiaceae species from the state of Espírito Santo, Brazil. We analyzed herbarium specimens (BHCB, CRVD, MBML, RB, SPF and VIES) and collected specimens in field expeditions from January 2018 to April 2019. *Bunchosia* was the richest genus with three species recorded in this state, followed by *Barnebya*, *Heladena*, and *Thryallis*, with a single species each. We present morphological descriptions, identification keys, taxonomic notes, distribution maps, and photographic plates for all species.

Key words: Atlantic Forest, Brazil, lianas, Malpighiales, taxonomy.

Resumo

Apresentamos o tratamento taxonômico de quatro gêneros e seis espécies de Malpighiaceae do estado do Espírito Santo, Brasil. Analisamos exsicatas de herbários (BHCB, CRVD, MBML, RB, SPF e VIES) e espécimes coletados em expedições de campo entre janeiro de 2018 e abril de 2019. *Bunchosia* foi o gênero de maior riqueza com três espécies registradas neste estado, seguido por *Barnebya*, *Heladena*, e *Thryallis* com uma única espécie, cada. Apresentamos descrições morfológicas, chaves de identificação, comentários taxonômicos, mapas de distribuição geográfica e pranchas de imagens para todas as espécies.

Palavras-chave: Floresta Atlântica, Brasil, lianas, Malpighiales, taxonomia.

Introduction

Malpighiaceae comprises 77 genera and 1,300 species mainly distributed in the Neotropical region (Anderson 1981). In Brazil, this family is represented by 46 genera and 588 species recorded in all states of the federation, with 354 species endemic to this country (Almeida *et al.* 2020). Malpighiaceae is morphologically recognized by the presence of T-Y-V-shaped malpighiaceous hairs (*i.e.*, unicellular hairs with a base and two lateral projections, named branches), petals clawed, and sepals bearing a pair of oil-secreting glands (*i.e.*, elaiophores), with the anterior sepal usually eglandular (Anderson 1981). This family shows a conspicuous conserved floral morphology among all its genera, making its traditional classification heavily relied on leaf and fruit characters (Anderson 1981).

The state of Espírito Santo is entirely covered by the Atlantic Forest biome, comprising several phytophysiognomies such as pioneer formations, semideciduous forests, rainforests, inselbergs, and montane grasslands (Garbin *et al.* 2017). The Atlantic Forest is one the most diverse and threatened worldwide hotspots for conservation (Tabarelli *et al.* 2004; Mittermeier *et al.* 2005). This biome shows only ca. 13% of its original natural cover due to its growing urban population,

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reducing its natural vegetation to fragments smaller than 50 hectares within pasture, crops or urban centers (Ribeiro *et al.* 1999; Fundação SOS Mata Atlântica 2019). The state of Espírito Santo is currently the 7th most diverse state of the federation in plant species with 8.3% of endemic plant species (Dutra *et al.* 2015). On the other hand, Malpighiaceae is the 15th most diverse family in plant species in the state of Espírito Santo, with 129 species and 23 genera (Dutra *et al.* 2015).

Studies on Malpighiaceae taxonomy within the Atlantic Forest of state of Espírito Santo are relatively recent, starting about thirty years ago (Mamede 1984, 1992). For the Atlantic Forest, a synopsis of Malpighiaceae was published by Almeida *et al.* (2016) and *Bunchosia* (Almeida & Pellegrini 2016). A checklist of Malpighiaceae species from the state of Espírito Santo was published by Almeida & Mamede (2014), followed by the monographs of *Stigmaphyllon* (Almeida & Mamede 2016) and *Banisteriopsis* (Almeida 2020). Additional studies regarding new records, new species, distribution, and taxonomic notes of species occurring in the state of Espírito Santo have also been published over the last twenty years (Amorim 2003; Almeida *et al.* 2013, 2015, 2018; Almeida & Amorim 2015; Almeida 2017; Francener *et al.* 2018). And regarding taxonomic revisions, Almeida (2018) presents the monograph of *Amorimia* and Anderson (2014) described several new species and circumscription for *Hiraea* from the state of Espírito Santo.

Moving towards completing the taxonomic treatment of Malpighiaceae from the state of Espírito Santo, we present the taxonomic treatment for species of the Barnebyoid and Bunchosioid clades. These lineages were recently recovered by molecular studies in the family (Davis & Anderson 2010; Almeida & van den Berg 2021), being represented in this state by four genera [*i.e.*, *Barnebya* (Barnebyoid clade), *Bunchosia*, *Heladena*, and *Thryallis* (Bunchosioid clade)] and six species. We present identification keys, morphological descriptions, examined specimens, comments on distribution and taxonomy, distribution maps, and photographic plates.

Material and Methods

We analyzed specimens deposited at the BHCB, CRVD, MBML, RB, SAMES, SPF, VIC, and VIES herbaria, besides additional specimens and type specimens deposited in virtual herbaria (CEPEC, ESA, HUEFS, and NY), such as speciesLink (CRIA 2021) (acronyms according to Thiers, continuously updated). Additional specimens were also collected on field expeditions from 2017 to 2019 and deposited at the VIES herbarium collection. Samples of flowers and/or fruits collected on the field were preserved in 70% alcohol for identification and description purposes. All specimens were analyzed using a stereomicroscope, specialized literature (Niedenzu 1928; Radford *et al.* 1974; Anderson 1981, 2001, 2005, 2014; Anderson & Gates 1981; Chase 1981; Almeida 2018; Almeida & Pellegrini 2016) and consulting nomenclatural types on virtual herbaria. Geographical distribution data were obtained from the analyzed specimens and the phytophysiognomy classification proposed by Veloso *et al.* (1991). Maps were elaborated with ArcGis 9.2 (ESRI 2010), with shapefiles obtained from IBGE (2015). Additionally, we used the "Lista Nacional de Espécies da Flora Ameaçadas de Extinção" (CNCFlora 2019) and "Lista das Espécies Ameaçadas do Espírito Santo" (Fraga *et al.* 2019) to identify threatened species.

Results and Discussion

An identification key for all Malpighiaceae genera occurring in the Atlantic Forest biome can be found in Almeida *et al.* (2016).

Barnebyoid clade sensu Almeida & van den Berg (2021)

The Barnebyoid clade currently comprises a single genus, *Barnebya*, and two species endemic to Brazil (Davis & Anderson 2010; Almeida *et al.* 2020).

1. *Barnebya dispar* (Griseb.) W.R.Anderson & B.Gates, Brittonia 33(3): 280. 1981. Figs. 1; 4

Trees, 5–10 m tall; branches glabrous; stipules interpetiolar, 2.3–4.7 mm long, narrowly triangular, deciduous, free. Leaves reduced associated to inflorescences absent; petiole 6–15 mm long, flattened, glabrescent, eglandular; leaf blade 4–8.4 × 3.3–4.1 cm, chartaceous, oblanceolate, base cuneate, margin entire, plane, apex acute to cuspidate, both surfaces glabrous, primary vein abaxially impress, 2-glandular at base. Thyrses of 2-flowered cincinni, 6–25 flowers; main axis glabrous; bracts ca. 1.6 mm long, membrane, triangular, deciduous, eglandular; peduncles 1.3–1.5 cm long; bracteoles ca. 1 mm long, membrane, triangular, deciduous,

eglandular. Flowers with pedicels 1–1.2 cm long, glabrous; sepals adpressed to the androecium, ca. 2.4 × 1.6 mm, apex rounded, both surfaces glabrous; elaiophores 2 per sepal, yellow, ca. 3.5 × 1.1 mm; petals yellow, limb obovate, margin fimbriate, glandular; lateral petals with limb ca. 4.5 × 3.4 mm, claws ca. 0.8 × 0.2 mm; posterior petal with limb ca. 4.4 × 2 mm, claws ca. 0.9 × 0.4 mm. Stamens with filaments ca. 2 mm long, connectives glandular covering the posterior part of thecae, thecae glabrous; ovary ca. 2.8 × 2 mm, fusiform, sericeous; styles ca. 2.4 × 0.1 mm, erect, divergent, cylindrical, glabrous; stigma apical, truncate. Mericarps winged, dorsal winged more developed than lateral ones, lateral wings absent, brown when mature; dorsal wing ca. 4.8 × 2.1 cm, glabrous; nut ca. 1.8–1.9 cm long, rugose, glabrescent.

Examined material: Santa Teresa, Estação Biológica de Santa Lúcia, 21.IX.1993, *L.D. Thomaz 950* (MBML); 18.VIII.1993, *L.D. Thomaz 1043* (VIES).

Additional examined material: BRAZIL. MINAS GERAIS: Carangola, Fazenda Santa Clara, 5.VIII.2006, fr., *A.L.A. Faria 27* (RB). RIO DE JANEIRO: Nova Iguaçu, estrada para Boa Esperança, 16.I.2002, fl., *S.J. Silva-Neto 1624* (RB).

Barnebya dispar is endemic to the Atlantic Forest biome of Brazil, occurring in the states of Bahia, Minas Gerais, Espírito Santo, Rio de Janeiro, and São Paulo (Anderson 1981; Almeida *et al.* 2020). In the state of Espírito Santo, *B. dispar* occurs in rainforests, but it has never been collected with flowers and/or fruits in this state. It is also regarded as threatened in the state of Espírito Santo (Fraga *et al.* 2019) and not threatened in the Atlantic Forest biome (CNCFlora 2019).

Barnebya comprises only two species characterized by being trees of 2–15 m tall; stipules interpetiolar, free, deciduous; leaves alternate; petioles eglandular; base of leaf blades cuneate; thyrses of 2-flowered cincinni; and calyx 10-glandular, glands decurrent onto pedicel (Anderson 1981). In the state of Espírito Santo, *Barnebya dispar* is differentiated from the remaining species of Malpighiaceae by being the only tree species in this state bearing winged mericarps (personal observation). Additionally, this species only shows two sterile records from the same individual within Santa Lúcia Biological Reserve in the municipality of Santa Teresa. Nonetheless, this individual was not found during field expeditions in the abovementioned conservation unit. This species is only represented by 40 records throughout the Atlantic Forest biome of Brazil, probably due to being a rare canopy tree (personal observation).

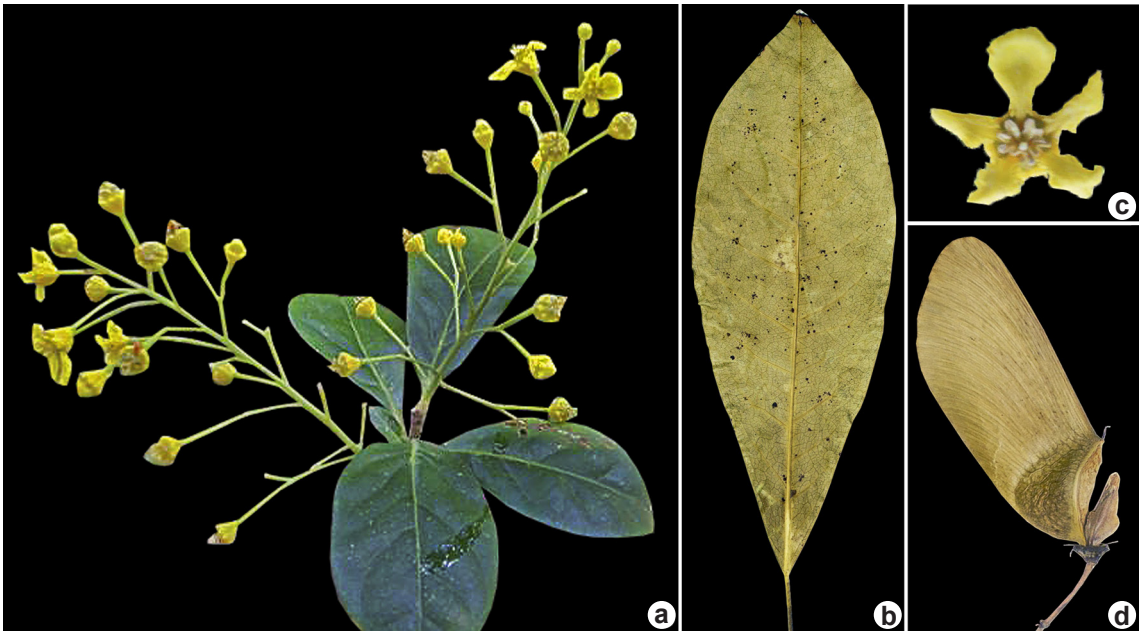

Figure 1 – a-d. Photographic plate of *Barnebya dispar* – a. flowering branch; b. detail of the abaxial surface of a leaf; c. flower in frontal view; d. winged mericarp in side view. Photographs by P.Sampaio.

Bunchosioid clade sensu Almeida & van den Berg (2021)

The Bunchosioid clade currently comprises three genera (*i.e.*, *Bunchosia*, *Heladena*, and *Thryallis*) in the state of Espírito Santo, with only *Thryallis* being endemic to Brazil (Davis & Anderson 2010; Almeida *et al.* 2020).

2. *Bunchosia* Kunth, Nov. Gen. Sp. (quarto ed.) 5: 153. 1821 [1822].

Trees to shrubs; stipules epipetiolar. Leaves reduced associated to the inflorescence absent; petiole 0–2-glandular at apex; leaf blade narrowly elliptic, elliptic to lanceolate, margin entire, plane, primary vein slightly abaxially impressed to impressed, 2-glandular at base or 2–6-glandular, submarginal. Thyrses of 1-flowered cincinni, bracts and bracteoles persistent. Flowers with pedicels sessile (*i.e.*, without peduncles); sepals adpressed to the androecium, 2-glandular; elaiophores 8–10. Drupes, 2–3-pyrenes, red to orange when mature, apex acute, glabrous.

Bunchosia differs from the remaining genera of Malpighiaceae from the state of Espírito Santo by drupes with acute apex and small trees or shrubs with thyrses of 1-flowered cincinni (Almeida *et al.* 2016). The genus comprises ca. 70 species found from Mexico to Northern Argentina (González-Gutiérrez 2010), with eleven species occurring in Brazil (BFG 2018). In this study, a total of three species of *Bunchosia* were recorded for the state of Espírito Santo.

Identification key for the species of *Bunchosia* from the state of Espírito Santo

1. Petiole eglandular.....2.3. *Bunchosia maritima*
1'. Petiole 2-glandular at apex.
   2. Branches sericeous to glabrescent; leaf blade membranaceous, elliptic..... 2.2. *Bunchosia macilenta*
   2'. Branches glabrous; leaf blades chartaceous, narrowly elliptic to lanceolate..... 2.1. *Bunchosia acuminata*

2.1. *Bunchosia acuminata* Dobson, Systematic Botany 8(3): 275. 1983. Figs. 2; 4

Shrubs ca. 4 m tall; branches glabrous; stipules epipetiolar, 1.6–3 mm long, narrowly triangular, deciduous, free. Leaves reduced associated to the inflorescence absent; petiole 5.5–9.6 mm long, canaliculate, glabrous, 2-glandular at apex; leaf blade 8–16 × 2.8–5.6 cm, chartaceous, narrowly elliptic to lanceolate, base acute to attenuate, margin entire, plane, apex acuminate, both surfaces glabrous, primary vein abaxially impressed, 2-glandular at base. Thyrses with 11–15 flowers; main axis sparsely sericeous to glabrous; bracts 1.1–2.6 mm long, chartaceous, triangular, persistent, eglandular; peduncles up to 3 mm long; bracteoles 1.1–1.8 mm long, membrane, triangular, persistent, eglandular. Flowers with pedicels 4–10 mm long, glabrescent to glabrous; sepals adpressed to the androecium, 1.6–1.9 × 1.3–1.4 mm, apex rounded, both surfaces glabrous, 2-glandular; elaiophores 10, yellow, 2–2.5 × ca. 1.2 mm; petal yellow, limb orbicular, margin erose; lateral petals limb with 3.2–4 × 3.2–4.4 mm, claws 1.6–1.9 × ca. 0.2 mm; posterior petal ca. 2.7 × 3.2 mm, claws ca. 2 × 0.4 mm; stamens with filaments 0.9–1.2 mm long, connectives glandular, expanding at apex, thecae glabrous; ovary ca. 0.6 × 0.6 mm, conical, glabrous; styles ca. 1 × 0.1 mm, erect, parallel, cylindrical, glabrous; stigma apical, truncate. Drupes, 0.9–1.1 × 1.2–1.3 cm, 2–3-pyrenes, red when mature, glabrous.

Examined material: Conceição da Barra, Reserva Biológica do Córrego Grande, 13.II.2009, fr., *L.F.T. Menezes 1899* (VIES). Pinheiros, Reserva Biológica Córrego do Veado, 23.II.2011, fr., *M. Ribeiro 450* (SAMES); 1.II.2007, fl., *L.M. Versieux* 409 (RB); 26.X.2000, fl., *V. Demuner 1513* (MBML). Sooretama, Reserva Biológica de Sooretama, 19.I.2010, fr., *M. Ribeiro 74* (VIES).

Bunchosia acuminata is endemic to Brazil occurring in the states of Bahia and Espírito Santo (Almeida & Pellegrini 2016; BFG 2018). In the state of Espírito Santo, *B. acuminata* can be found in seasonally dry forests and rainforests. It was collected with flowers from October to April and fruit from November to May. It is also currently regarded as vulnerable by Fraga *et al.* (2019) and not threatened by CNCFlora (2019). *B. acuminata* is distinguished from the remaining species of *Bunchosia* from the state of Espírito Santo by its narrowly elliptic to lanceolate and glabrous leaves.

2.2. *Bunchosia macilenta* Dobson, Systematic Botany 8(3): 274. 1983. Figs. 3; 4

Shrubs, 1–3 m tall; branches sericeous to glabrescent; stipules epipetiolar, 0.5–1.1 mm long, triangular, deciduous, free. Leaves reduced associated to the inflorescence absent; petiole 6–8 mm long, canaliculate, sericeous, 2-glandular at apex; leaf blade 7.9–10.3 × 4.6–5.4 cm, membrane, elliptic, base acute, margin plane, apex acute, both surfaces glabrescent, primary vein abaxially impressed, 2–4-glandular abaxially, submarginal. Thyrses with 4–8 flowers; main axis sericeous; bracts 0.9–1.1 mm long, chartaceous, triangular, persistent, eglandular; peduncles 2–2.3 mm long; bracteoles 0.6–0.8 mm long, chartaceous, triangular, persistent, eglandular. Flowers with pedicels 8–10 mm long, sericeous; sepals adpressed to the androecium, ca. 2.4 × 1 mm, apex rounded, adaxially glabrous, abaxially sericeous, 2-glandular; elaiophores 10, yellow, 1.1–1.3 × 0.8–1.1 mm; petals yellow, limb obovate, margin fimbriate; lateral petals limb with 3.4–3.7 × 2.9–3.2 mm, claws 2.2 × 0.3 mm; posterior petal limb with ca. 3.6 × 3.9 mm, claws ca. 3.3 × 1.4 mm; stamens with filaments 1.6–2.9 mm long, connectives glandular covering the posterior part of thecae, thecae glabrous; ovary ca. 1.1 × 0.7 mm, botuliform, glabrous; styles ca. 2.6 × 0.1 mm, erect, divergent, cylindrical, glabrous; stigma apical, truncate. Drupes, 0.7–1 cm long, 3-pyrenes, orange when mature, glabrous.

Examined material: Águia Branca, propriedade do Sr. Ailton Cortelete, 16.I.2008, fl., *M.M. Saavedra 652* (MBML). Castelo, Parque Estadual Mata das Flores, 15.XII.2012, fl., *M.L. Garbin 1529* (VIES). Colatina, 27.IV.1995, fr., *G.F. Árbocz 1367* (VIES). Linhares, Reserva Natural da Vale, 1.VI.2001, fr., *D.A. Folli 3939* (CVRD). Santa Teresa, São João de Petrópolis, 24.I.2006, fl., *L. Kollmann 8597* (MBML). Serra, APA Mestre Álvaro, 13.I.2011, fl., *A.M. Vago 144* (VIES).

Bunchosia macilenta is endemic to Brazil in the states of Minas Gerais, Bahia, and Espírito

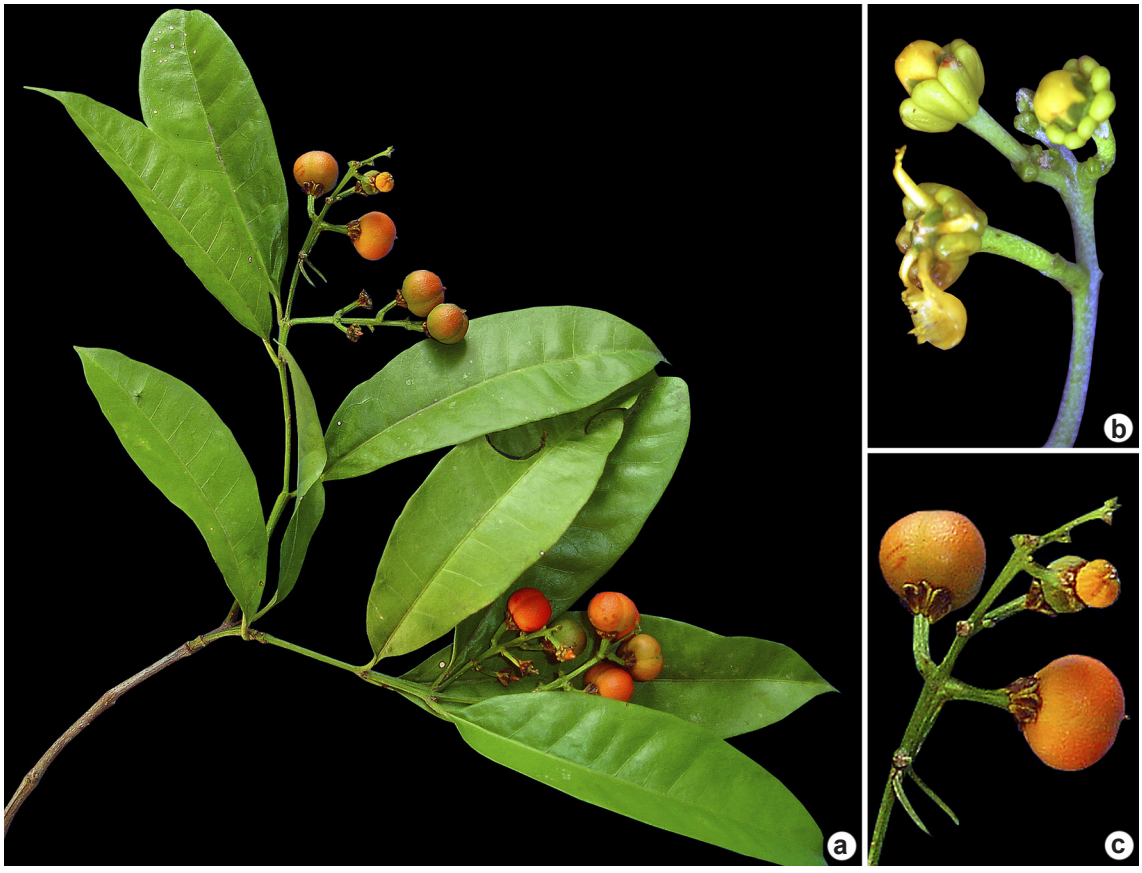

Figure 2 – a-c. Photographic plate of *Bunchosia acuminata* – a. fruiting branch; b. detail of the inflorescence in side view; c. detail of the drupes in side view. Photographs: a, c. G.S. Siqueira; b. J.P. Zorzanelli.

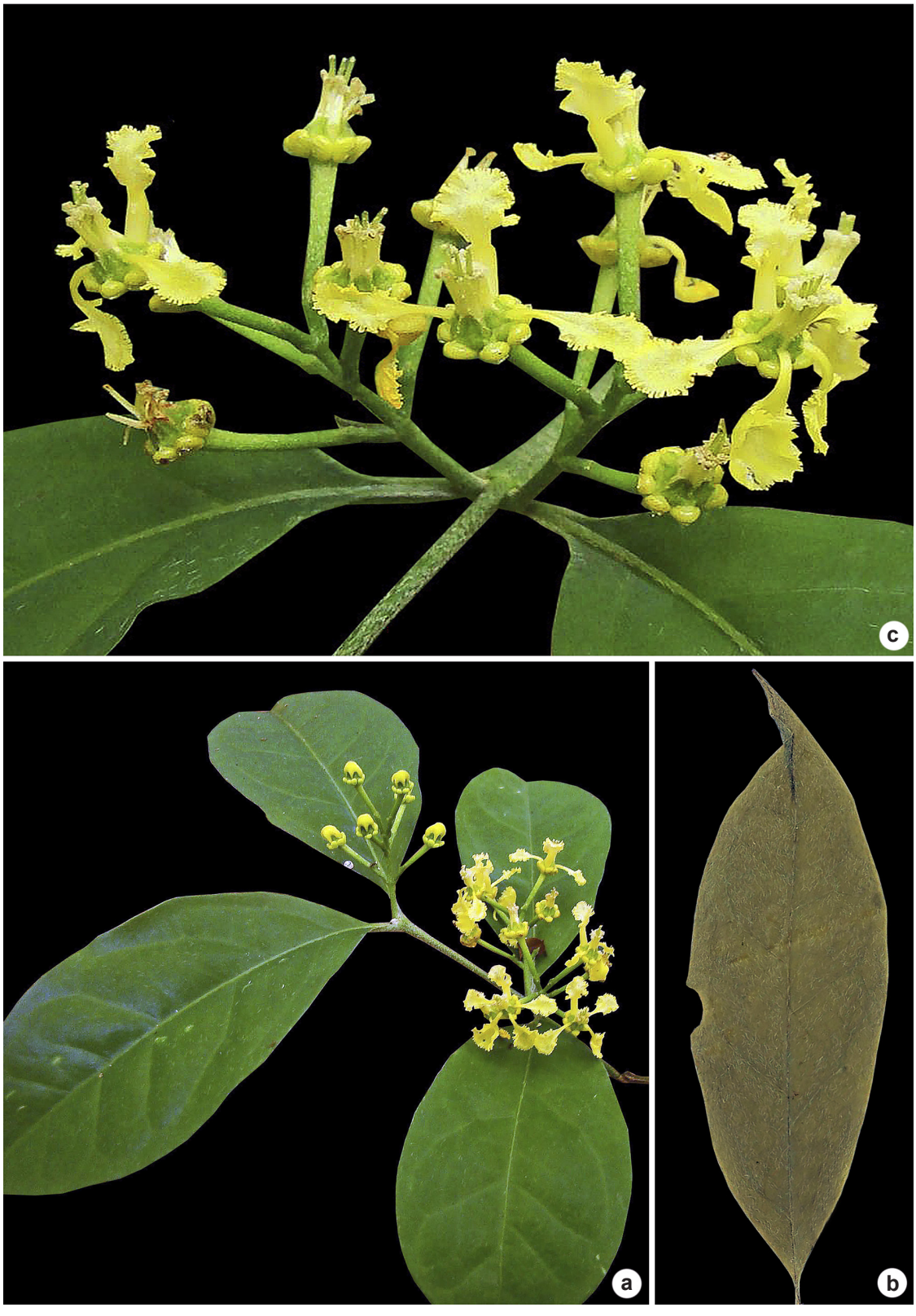

Figure 3 – a-c. Photographic plate of *Bunchosia macilenta* – a. flowering branch; b. leaf in adaxial view; c. detail of the inflorescence. Photographs: H. Liuth.

Santo (Almeida & Pellegrini 2016; Almeida *et al.* 2020). In the state of Espírito Santo, it occurs in rainforests, being collected with flowers from December to February and with fruits from January to July. *B. macilenta* is regarded as vulnerable by both CNCFlora (2019) and Fraga *et al.* (2019). This species can be confused with *B. maritima* by the shape of their leaves, but they

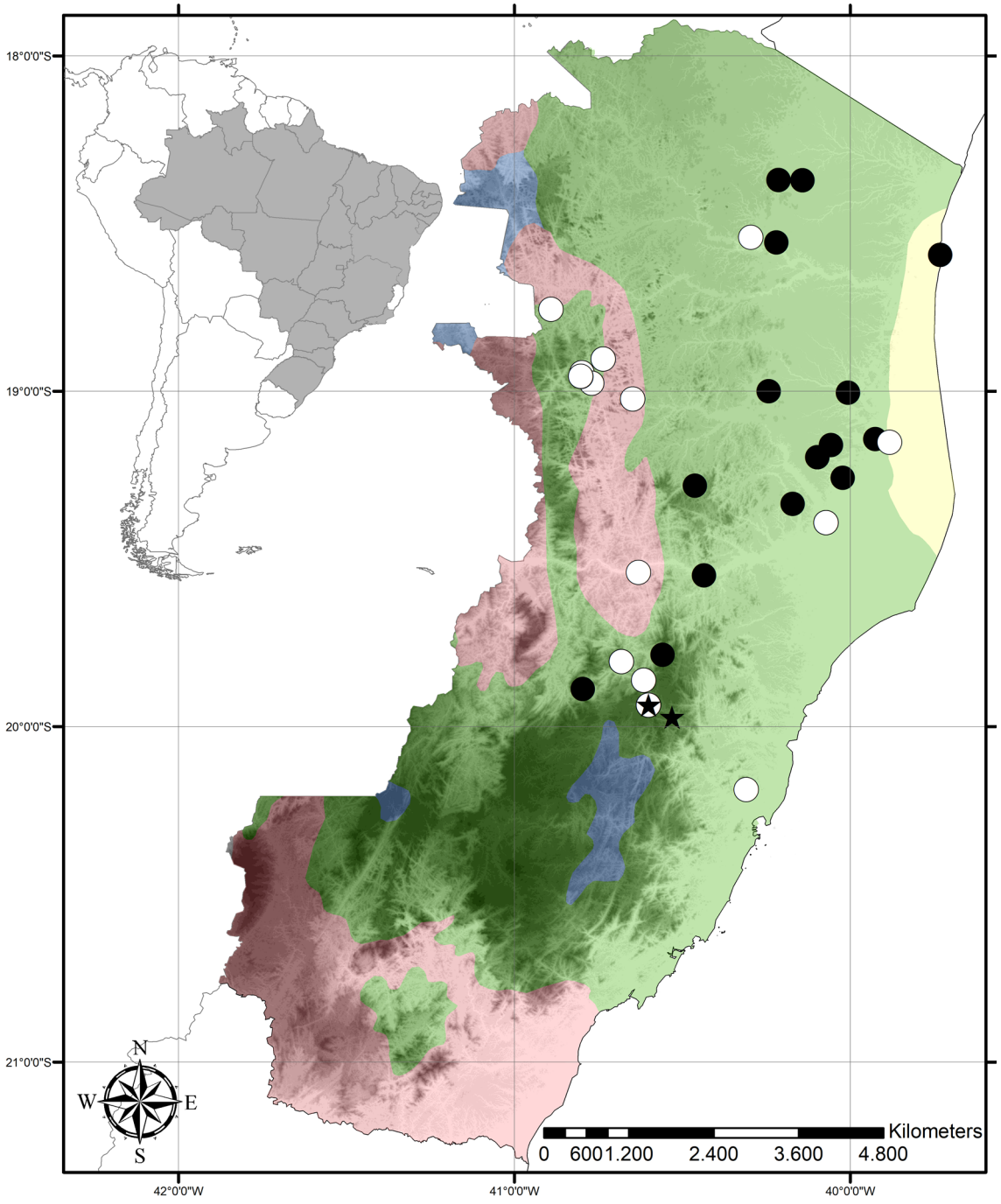

Figure 4 – Distribution map of *Barnebya dispar* (black stars), *Bunchosia acuminata* (white circles), and *Bunchosia macilenta* (black circles). Shades of black on the background represent montane relief. Pink = seasonally dry forest; green = rainforest; blue = open rainforest; yellow = pioneer formations.

are easily differentiated by branches sericeous to glabrescent (*vs*. glabrous in *B. maritima*), membrane leaf blades (*vs*. chartaceous in *B. maritima*), and the number of flowers per thyrse (4–8 flowers in *B. macilenta vs*. 9–13 flowers in *B. maritima*).

2.3. *Bunchosia maritima* (Vell.) J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13(3/3): 860. 1950. Figs. 5; 8

Shrubs, ca. 3 m tall; branches glabrous; stipules epipetiolar, 0.6–0.7 mm long, triangular, deciduous, free. Leaves reduced associated to

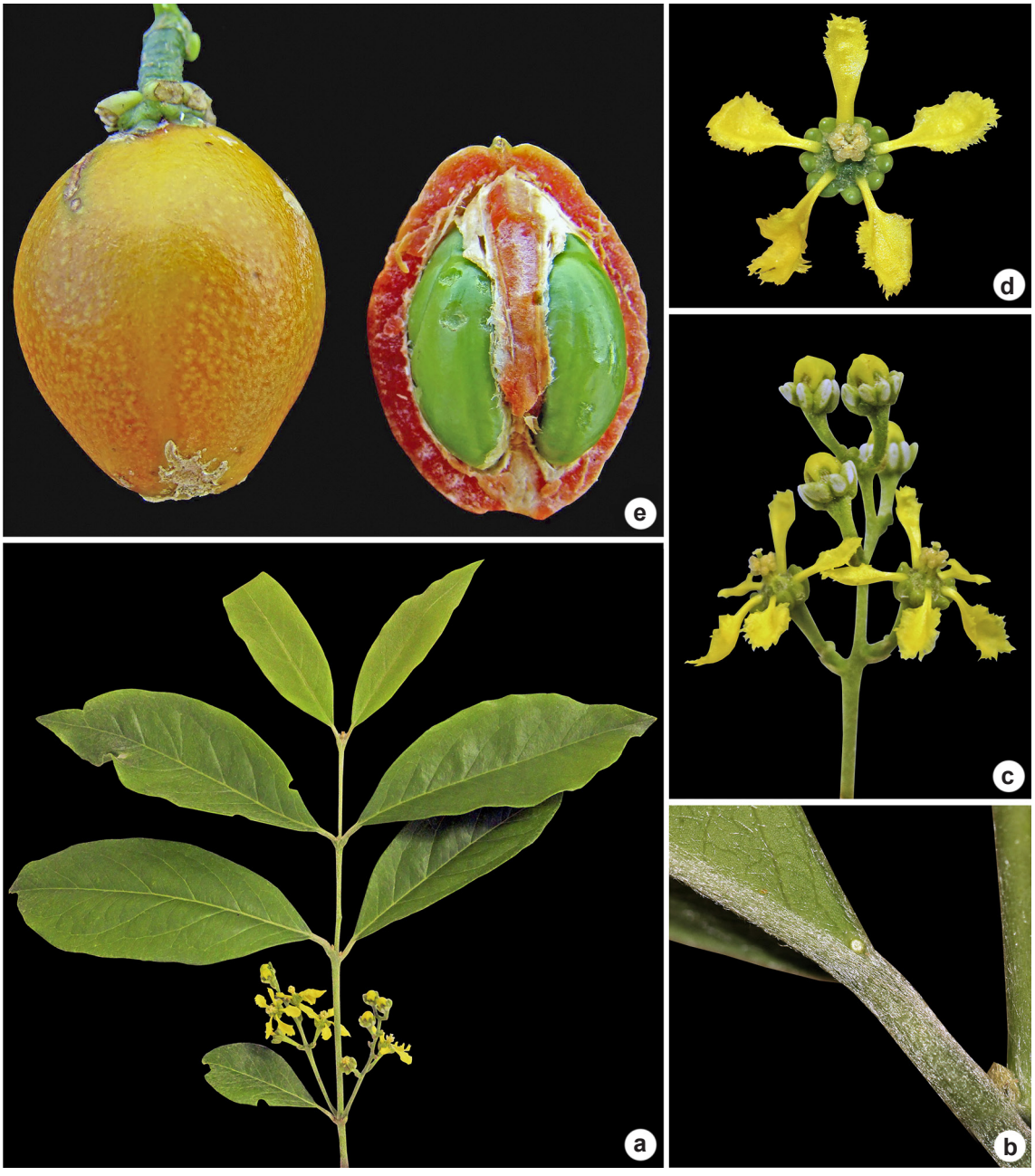

Figure 5 – a-e. Photographic plate of *Bunchosia maritima* – a. flowering branch; b. detail of the petiole; c. inflorescence in side view; d. flower in frontal view; e. detail of the drupes. Photographs: a-d. M.O.O. Pellegrini; e. A. Junior.

the inflorescence absent; petiole 8–11 mm long, canaliculate, sericeous, eglandular; leaf blade 11.1–25.5 × 6.3–9.1 cm, chartaceous, elliptic, base acute, margin plane, apex acuminate, both surfaces glabrous, primary vein slightly abaxially impressed, 4–6-glandular, abaxially, submarginal. Thyrses with 9–13 flowers; main axis sericeous; bracts 2.2–3 mm long, chartaceous, triangular, persistent, eglandular; peduncles 2.4–3.3 mm long; bracteoles 1.3–2.4 mm long, chartaceous, triangular, persistent, 1-glandular. Flowers with pedicels 0.4–5.3 mm long, sericeous; sepals adpressed to the androecium, ca. 2.4 × 1.7 mm, apex rounded, both surfaces glabrous, the lateral four sepals 2-glandular, the anterior eglandular; elaiophores 8, yellow, ca. 4 × 0.9 mm; petals yellow, limb elliptic to obovate, margin fimbriate, glandular; lateral petals limb with 4.3–5 × 3–4.7 mm, claws ca. 2.2 × 0.6 mm; posterior petal limb with ca. 3.7 × 3.3 mm, claws ca. 3.2 × 0.8 mm; stamens with filaments ca. 1.2 mm long, connectives glandular covering the posterior side of the thecae, thecae glabrous; ovary ca. 1.6 × 0.8 mm, ovoid, glabrous; styles ca. 1.2 × 0.2 mm, erect, parallel, cylindrical, glabrous; stigma apical, papillose. Drupe, 0.75–0.84 × 0.7–0.8 cm, 3-pyrenes, red when mature, glabrous.

Examined material: Alegre, ARIE Laerth Paiva Gama, 15.II.2008, fr., *D. Couto 1391* (MBML). Aracruz, Picuã, 16.IV.2011, fr., *T.F. Sagrillo 4* (MBML). Cachoeiro de Itapemirim, Floresta Nacional de Pacotuba, 5.III.2008, fr., *L. Magnago 10733* (MBML). Cariacica, Reserva Biológica Duas Bocas, 16.II.2008, fr., *A.M. Amorim 7142* (MBML). Linhares, lado direito da estrada indo da Encapa para Pedra Lisa, 16.III.1993, fr., *V.D. Souza 454* (CVRD). Santa Leopoldina, Bragança, Rancho Chapadão, 30.VI.2006, fr., *Jaqueline 2099* (MBML).

Bunchosia maritima is endemic to Brazil occurring in the states of Minas Gerais, Rio de Janeiro, Espírito Santo, São Paulo, Paraná, and Santa Catarina (Almeida & Pellegrini 2016; Almeida *et al.* 2020). In the state of Espírito Santo, it occurs in seasonally dry forests and rainforests, with flowers collected in January and fruits from December to July. Characters differentiating *B. maritima* and *B. macilenta* were discussed above, but *B. maritima* is the only species of *Bunchosia* with eglandular petioles.

3. *Heladena multiflora* (Hook. & Arn.) Nied., Arbeiten Bot. Inst. Königl. Lyceums Hosianum Braunsberg 5: 16. 1914. Figs. 6; 8

Woody lianas; branches sparsely velutine to glabrescent; stipules epipetiolar, ca. 0.8 mm long, falcate, persistent, free. Leaves reduced associated to the inflorescence present; petiole 3–4.1 mm long, canaliculate, glabrous, eglandular; leaf blade 4.7–13.8 × 1.9–7.1 cm, membrane, elliptic, base attenuate, margin entire, plane, apex acute, both surfaces glabrous, primary vein abaxially impressed, 2-glandular at base. Thyrses of 1-flowered cincinni, 12–27 flowers; main axis sparsely sericeous; bracts 1.3–2 mm long, membrane, triangular, persistent, eglandular; peduncle 1.3–5.4 mm long; bracteoles 0.6–0.8 mm long, membrane, triangular, persistent, eglandular. Flowers with pedicels 2–4.5 mm long, sericeous; sepals parallel to the androecium, 1.9–2.3 × ca. 1.1 mm, apex rounded, both surfaces glabrous, the lateral four 2-glandular, the anterior eglandular; elaiophores 8, stipitate, green, 1.6–1.9 × 1.3–0.6 mm; petals yellow, limb obovate, margin partially lacerate; lateral petals limb with 2.6–2.9 × 2–2.3 mm, claws ca. 1.6 × 0.2 mm; posterior petal limb with ca. 5 × 4.5 mm, claws ca. 2.7 × 0.4 mm; stamens with filaments 1.7–2.5 mm long, connectives glandular covering the posterior part of the thecae, thecae glabrous; ovary ca. 1 × 0.7 mm, botuliform, sericeous; styles ca. 1.3 × 0.15 mm, erect, divergent, cylindrical, sericeous; stigma apical, truncate. Mericarp wingless, brown when mature, sericeous; nut 2.3–3.5 mm long.

Examined material: Boa Esperança, 16.XII.2007, fl., *L. Kollmann 10205* (MBML). Santa Teresa, beira da estrada para o 25 de Julho, 3.XII.1998, fr., *L. Kollmann 1215* (MBML); estrada do 25 de julho, 13.XII.2016, fr., *L. Kollmann 13218* (MBML).

Heladena multiflora occurs in seasonally dry to rainforests from Argentina, Paraguay, and Brazil (states of Mato Grosso, Mato Grosso do Sul, Minas Gerais, and Espírito Santo) (Almeida *et al.* 2020). It was collected in flower and fruit in December, being regarded as endangered by both CNCFlora (2019) and Fraga *et al.* (2019). *H. multiflora* is distinguished from the remaining species of Malpighiaceae in the state of Espírito Santo by stipitate elaiophores, present since the floral bud and by wingless mericarps resembling those of *Thryallis*.

4. *Thryallis brachystachys* Lindl., Bot. Reg. 14: 1162. 1828. Figs. 7; 8

Woody lianas; branches sericeous to glabrescent; stipules epipetiolar, 0.6–0.7 mm long, triangular, deciduous, free. Leaves reduced associated to the inflorescence absent; petiole 1–1.1 cm long, canaliculate, tomentose, eglandular; leaf

blade 5.2–6.1 × 2.9–3.5 cm, chartaceous, elliptic to ovoid, base obtuse, margin plane, apex acute to rounded, adaxially glabrous, abaxially tomentose, primary vein abaxially impressed, 2–4-glandular at base of leaves. Thyrses of 1-flowered cincinni, 6–16 flowers; main axis tomentose; bracts 1.6 mm long, chartaceous, triangular, deciduous; peduncles 3–3.7 mm long, tomentose; bracteoles 1.2 mm long, chartaceous, triangular, deciduous. Flowers with pedicels 6–9 mm long, tomentose; sepals 0.3–0.4 × ca. 1.1 cm, apex rounded, adaxially glabrous, abaxially tomentose, eglandular; petals yellow, margin erose; lateral petals flabellate, limb with 5.1–5.3 × 9–9.3 mm, claws ca. 4.1 × 1.2 mm; posterior petal orbicular with limb ca. 6 × 9 mm, claws ca. 3.3 × 0.9 mm; stamens with filaments 1 mm long, connectives glandular, thecae glabrous; ovary ca. 1.1 × 1.5 mm, conical, sericeous; styles ca. 3 × 0.1 mm, erect, divergent, cylindrical, glabrous; stigma apical, pedaliform. Mericarps wingless, 3–3.4 × 4.8–5.3 mm, sepals expanded in fruits, brown when mature, rugose, tomentose.

Figure 6 – a-c. Photographic plate of *Heladena multiflora* – a. fruiting branch; b. flower in frontal view; c. mericarp in side view. Photographs: A. Francener.

Examined material: Vila Velha, 6.V.1946, fr., *A.C. Brade 18083* (RB).
Additional examined material: BRAZIL. RIO DE JANEIRO: Maricá, Serra do Camburi, 1.II.2017, fl., *D.N.S. Machado 1196* (RB).

Thryallis brachystachys occurs in Paraguay and Brazil in the states of Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina (Almeida *et al.* 2020). In the state of Espírito Santo, it is represented by a single collection from the *restingas* of Vila Velha dated from 1946. It was found in fruit in May, and it is regarded as critically endangered by Fraga *et al.* (2019). *T. brachystachys* is distinguished from the remaining species of Malpighiaceae from the state of Espírito Santo by stellate hairs, expanded and eglandular sepals in fruits, and wingless mericarps.

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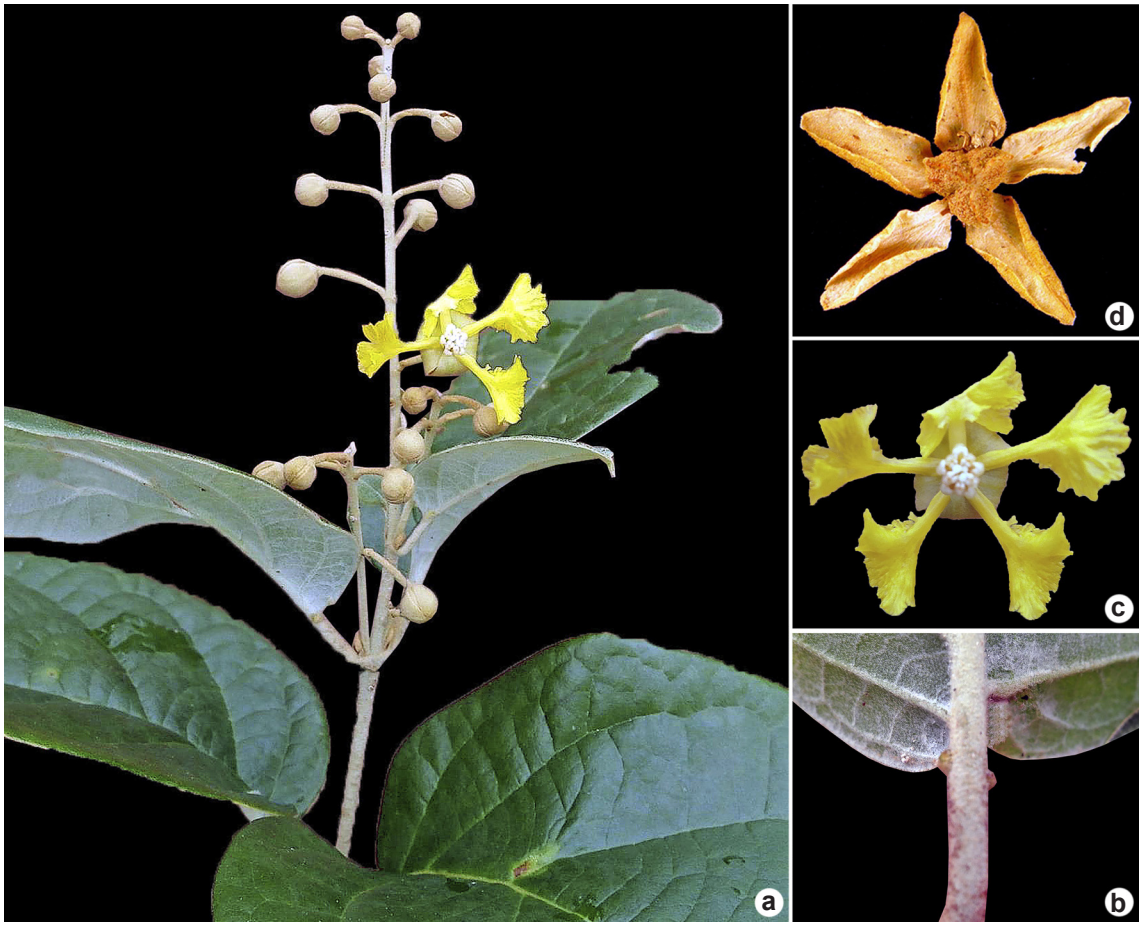

Figure 7 – a-d. Photographic plate of *Thryallis brachystachys* – a. flowering branch; b. detail of the petiole; c. flower in frontal view; d. mericarps with expanded sepals. Photographs: a-b. M. Ferreira; c-d. W.R. Anderson.

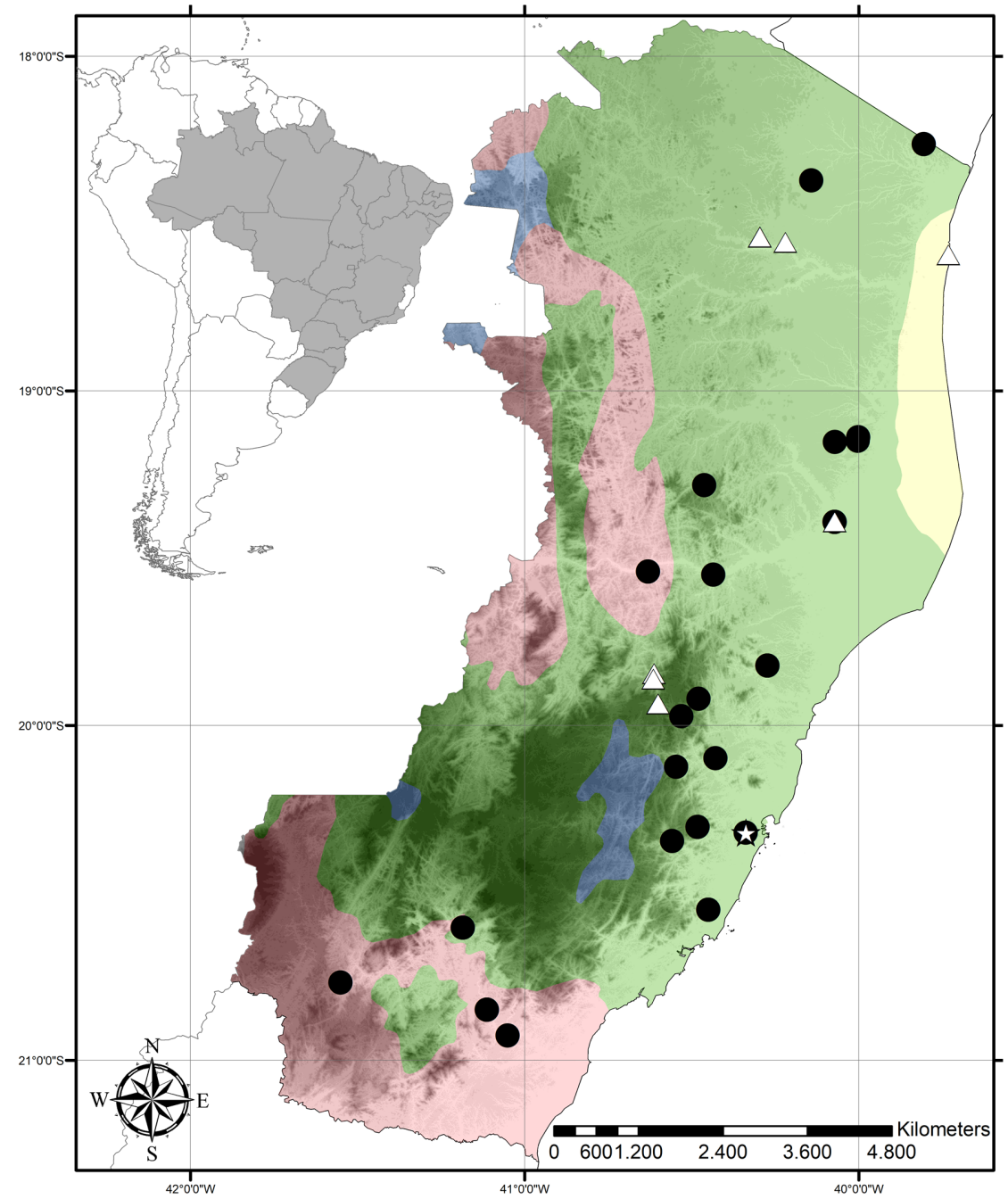

Figure 8 – Distribution map of *Bunchosia maritima* (black circles), *Heladena multiflora* (white triangles), and *Thryallis brachystachys* (white star). Shades of black on the background represent montane relief. Pink = seasonally dry forest; green = rainforest; blue = open rainforest; yellow = pioneer formations.

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