



Original Paper

Mentheae (Nepetoideae - Lamiaceae) from the Itatiaia National Park, Brazil

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Abstract

This study details the floristic diversity of Mentheae (Lamiaceae - Nepetoideae) from the Itatiaia National Park, the first Protected Area in Brazil. Among the 30 species of Lamiaceae cited for the Park, we recorded 15 species belonging to Mentheae arranged in seven genera: *Cunila* (2 spp.), *Hedeoma* (1 sp.), *Hesperozygis* (1 sp.), *Lepechinia* (1 sp.), *Prunella* (1 sp.), *Rhabdocaulon* (1 sp.), and *Salvia* (8 spp.). The region presents significant diversity, considering the 62 native species of Mentheae recorded in the Brazilian Southeast. The species are distributed in the Park's different vegetation types, mostly in shaded areas of the ombrophilous forests or throughout high-altitude grasslands. We provide a complete description for each species and an identification key, as well as comments on species distribution, habitat, morphological variation, and phenology.

Key words: Atlantic Forest, flora, Mantiqueira Range, Menthinae, Salviinae.

Resumo

Este estudo detalha a diversidade florística de Mentheae (Lamiaceae - Nepetoideae) no Parque Nacional do Itatiaia, a primeira Unidade de Conservação no Brasil. Dentre as 30 espécies de Lamiaceae citadas para a região, encontramos 15 pertencentes a Mentheae, distribuídas em sete gêneros: *Cunila* (2 spp.), *Hedeoma* (1 sp.), *Hesperozygis* (1 sp.), *Lepechinia* (1 sp.), *Prunella* (1 sp.), *Rhabdocaulon* (1 sp.) e *Salvia* (8 spp.). A região apresenta significativa diversidade, considerando as 62 espécies nativas de Mentheae registradas para o sudeste brasileiro. As espécies se encontram distribuídas em diferentes tipos de vegetações do Parque, principalmente em áreas sombreadas das florestas ombrófilas ou por todo o campo de altitude. Descrições completas e uma chave de identificação são fornecidas, além de comentários sobre distribuição, hábitat, variação morfológica e fenologia das espécies.

Palavras-chave: Mata Atlântica, flora, Serra da Mantiqueira, Menthinae, Salviinae.

Introduction

Lamiaceae comprise approximately 7,280 species distributed in 12 subfamilies (Li *et al.* 2016; Li & Olmstead 2017; Stevens 2020). It is recognized for having cymose inflorescences, bicarpellar ovaries with a false septum, on which ovules are attached laterally, frequently bilabiate perianths and quadrangular stems (Harley *et al.* 2004). In South America, most of the Lamiaceae

species are represented by Nepetoideae (Dumort.) Luerss., the most diverse subfamily, which is divided into three tribes: Mentheae Dumort., Ocimeae Dumort. and Elsholtzieae (Burnett) R.W.Sanders & P.D.Cantino, the last one exotic to the South America (Drew & Systemsma 2012; Zhao *et al.* 2021). It is differentiated from the other subfamilies in Brazil due to the combination of frequently mucilaginous, often trigonal nutlets, investing or rarely bent embryo and tricellular,

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usually hexacolpate pollen (Harley *et al.* 2004; Baskin & Baskin 2007).

Mentheae is the richest tribe of Nepetoideae, with ca. 1,720 species distributed on all continents - except for the polar regions -, but mainly in Southeast and East Asia, the Mediterranean and Neotropical regions (Drew & Systma 2012; Drew *et al.* 2017). It is unique within Nepetoideae by its ascending or divergent (*Cunila* Mill.) stamens, under the superior portion of the corolla (*vs.* declinate stamens, over the inferior portion of the corolla, in Ocimeae). Other morphological features that characterize the tribe are the habit of shrubs, subshrubs, or herbs, slightly to markedly aromatic, inflorescences usually arranged in thyrses subdivided into cymules or in axillary verticillasters, in both cases presenting sessile bracts, and flowers with 5–15-nerved distinctly bilabiate calyx (Harley *et al.* 2004; Drew & Sytsma 2012). The tribe is segregated into five subtribes, with most of the diversity across the Neotropical region represented by Menthinae Endl. and Salviinae Endl. (Harley *et al.* 2004; Drew & Sytsma 2012).

Regarding Mentheae, Brazil hosts 105 native species, of which 76 are endemic (BFG 2018; Flora do Brasil 2020, continuously updated). Among the genera, *Salvia* L. is the richest, with 61 native and 48 endemic species (Oliveira *et al.* 2021). In the Brazilian Atlantic Forest, there are 93 native species of Mentheae, of which 66 are endemic to Brazil and 50 to the domain, occurring predominantly in forest understories (Harley *et al.* 2004; Flora do Brasil 2020, continuously updated).

The Atlantic Forest domain presents high levels of biological diversity in a vast latitudinal extension, however, currently only 12.4% to 28% of that area remains in the form of forest fragments due to the decline of habitat quality, anthropic action, and soil degradation from expanding agricultural activities (Martinelli *et al.* 2018; Rezende *et al.* 2018; Fundação SOS Mata Atlântica 2019). In this context, the importance of the Itatiaia National Park (INP) and all Protected Areas in the Mantiqueira Range as meaningful areas for conservation and biodiversity is highlighted. The present work aims to present the floristic survey of the Mentheae species from the Itatiaia National Park, the first Brazilian Protected Area and one of the most significant remnants of the Atlantic Forest in the central Mantiqueira Range.

Material and Methods

The Itatiaia National Park (INP) is located along the border of Minas Gerais, Rio de Janeiro, and São Paulo states, in the municipalities of Bocaina de Minas, Itamonte, Itatiaia, and Resende. It was created in 1937 through Federal Decree nº1,713 and is now part of a large mosaic of Protected Areas in the Mantiqueira Range. It comprises many vegetation types and habitats highly influenced by an altitudinal gradient, varying from submontane to high montane forests and open, high-altitude grasslands above 1,500 masl (IBAMA 1994; ICMBio 2012). The climate according to Köppen's (1900) classification is categorized under three subtypes of humid temperate: Csb, Cwb and Cwa.

The collections at the herbaria R, RB, RFA, and SPF (acronyms according to Thiers, continuously updated) were analyzed *in loco*, while other collections available through the ReFlora project (<<http://reflora.jbrj.gov.br/>>) and speciesLink network (<<https://specieslink.net/>>) were consulted online. Expeditions to the INP occurred every four months from 2017 to 2019. Specimens collected were then herborized and deposited at the herbaria RFA and RB. Identification was made using the specialized literature (Epling 1936, 1939; Epling & Toledo 1943; Harley *et al.* 2004; Santos & Harley 2004; Moon *et al.* 2009; Antar *et al.* 2019). The morphological terminology follows Harris & Harris (2001). The description of species lacking structures or presenting damaged specimens collected in the region was made with the support of additional material and the specialized literature (Epling 1939a; Epling & Stewart 1939; Epling & Toledo 1943; Epling & Játiva 1963; Santos 1991; Santos 1996; Santos & Harley 2004; Silva-Luz *et al.* 2012; O'Leary & Moroni 2016). Additional data on geographic distribution are derived from Epling & Toledo (1943), Antar *et al.* (2019), and Flora do Brasil 2020 (continuously updated). The species are presented in alphabetical order followed by their morphological description, images and additional comments about their distribution, habitat, variation, and phenology. Exotic, non-naturalized species are not included.

Results & Discussion

The seven recorded genera of Mentheae comprise 15 species: *Cunila galioides* Benth., *C. menthiformis* Epling, *Hedeoma crenata*

R.S.Irving, *Hesperozygis myrtoides* (A.St.-Hil. ex Benth.) Epling, *Lepechinia speciosa* (A.St.-Hil. ex Benth.) Epling, *Prunella vulgaris* L., *Rhabdocaulon coccineum* Epling, *Salvia articulata* Epling, *S. guaranitica* A.St.-Hil ex Benth., *S. itatiaiensis* Dusén, *S. mentiens* Pohl, *S. oligantha* Dusén, *S. ombrophila* Dusén, *S. sellowiana* Benth., and *S. splendens* Sellow ex Roem. & Schult. Among the species, 14 are native and 11 are endemic to Brazil, with 10 being endemic to the national Atlantic Forest (Flora do Brasil 2020, continuously updated). The species *Salvia secunda* Benth., endemic to Brazil, might be represented in the region through the specimen *A. Glaziou 16316A* (P) considering its locality designated as “Serra do Picú”, which is a formation partially found on the borders of the INP within Itamonte municipality. However, the imprecise description of the locality hinders a confirmation of its occurrence. The species *Clinopodium nepeta* (L.) Kuntze, *Salvia rosmarinus* Spenn. and specimens of the genera *Mentha* L. and *Origanum* L. were identified being cultivated in the proximities of the Park; these taxa, however, were excluded from analysis due to their exotic, cultivated origin.

The richness of Mentheae in the INP is relevant for the family in the area and in the context of the Atlantic Forest as well. A total of 29 species of Lamiaceae were previously cited for the INP (Carrijo *et al.* 2018) with Mentheae representing 14 of those. When compared to other surveyed regions in the Cerrado and the Atlantic Forest Domains in the Southeast of Brazil, the richness of Mentheae in the INP is relevant, making it the area with the most species

and genera (Tab. 1). Many of the listed species, such as *Salvia ombrophila* Dusén, are endemic or mainly found on the borders between the states of Minas Gerais, Rio de Janeiro, and São Paulo, with their collections seemingly concentrated in the INP for the most part, as previously also described by Epling & Toledo (1943) and Santos (1991). Therefore, aside from the high levels of richness, the Park plays a prominent role for the distribution of the national endemic flora. At the same time, studies measuring the conservation status of such species are still lacking.

The morphological characters of the androecium and gynoecium are extremely relevant for the systematics of Mentheae (Bentham 1848; Epling 1936, 1939; Marzinek 2002; Harley *et al.* 2004; Santos & Harley 2004; Drew & Sytsma 2012). Based on such characters, according to Drew & Sytsma (2012), the genera recorded in the INP can be categorized into three subtribes: Prunellinae Dumort. (*Prunella* L.), Menthinae [*Cunila* Mill., *Hedeoma* Pers., *Hesperozygis* Epling and *Rhabdocaulon* (Benth.) Epling] and Salviinae (*Lepechinia* Willd. and *Salvia*). Currently, Menthinae lacks in-depth studies regarding the circumscription of its genera due to the lack of several Neotropical species in the few studies contemplating the systematics of the group (Bräuchler *et al.* 2010; Drew & Systma 2012), while Salviinae has been widely discussed and revised by Santos (1991, 1996, 2004), Santos & Harley (2004), Drew & Sytsma (2013) and Drew *et al.* (2017). Species of *Salvia* are listed according to their respective sections based on the traditional taxonomic treatments (Bentham 1848; Epling 1939; Epling & Mathias 1957).

Table 1 – Comparison of the richness of Mentheae studied in localities in the Southeast of Brazil.

Locality	Number of genera	Number of species	Reference work
Grão Mogol - MG	1	1	Vásquez & Harley (2004)
Serra de São José - MG	1	1	Alves & Kolbek (2009)
Parque Estadual do Ibitipoca - MG	2	3	Mota <i>et al.</i> (2020)
Serra Negra - MG	3	4	Mota <i>et al.</i> (2017)
Serra do Cipó - MG	4	6	Silva-Luz <i>et al.</i> (2012)
Serra dos Órgãos - RJ	4	11	ICMBio (2008)
Parque Nacional do Itatiaia - MG/RJ	7	15	Present work

Taxonomic treatment

Key to the Mentheae (Nepetoideae - Lamiaceae) species from the Itatiaia National Park

1. Flowers with 4 stamens..... 2
- 1'. Flowers with 2 stamens..... 3
2. Leaves membranous to chartaceous, adaxially bullate, often pubescent on the veins; thecae at the apex of the filament..... 5. *Lepechinia speciosa*
- 2'. Leaves membranous, smooth, glabrous to puberulous; thecae lateral to the filament, forming a bifurcation with a subulate appendage..... 6. *Prunella vulgaris*
3. Calyx with tomentose or villous ring of trichomes internally; fertile anthers 2; connective inconspicuous or dilated, never elongate 4
- 3'. Calyx glabrous, scabrous or strigulose internally, without a ring of trichomes; fertile anther 1; connective elongate 8
4. Corolla tube 18–28 mm long, internally glabrous; calyx internally glabrescent to hirtellous on the throat; stem acutely tetragonus, deeply canaliculate 7. *Rhabdocaulon coccineum*
- 4'. Corolla tube 2.5–11 mm long, internally pubescent or villosulous; calyx internally villous or tomentose on the throat; stem obtuse-tetragonus, superficially canaliculate when young..... 5
5. Stamens included..... 6
- 5'. Stamens exerted..... 7
6. Calyx bilabiate with saccate tube, inferior lip lobes inflexed; corolla white with violaceous maculae on the throat and tube interior, tube 2.5–4 mm long, internally villosulous..... 3. *Hedeoma crenata*
- 6'. Calyx tubular to slightly bilabiate with turbinate apex, lobes deflexed; corolla lilac, tube 9–11 mm long, internally pubescent with swollen, often glandular trichomes forming two lines..... 4. *Hesperozygis myrtoides*
7. Leaves fasciculate, linear-lanceolate to narrow-elliptical, margin entire, blade 0.2–0.8 × 0.3–0.7 cm; internode 0.2–1 cm long..... 1. *Cunila galioides*
- 7'. Leaves decussate, elliptical to obovate or rarely ovate, margin serrate, blade 0.9–2.5(–3) × 0.5–1.5(–1.8); internode 0.6–4.8 cm long..... 2. *Cunila menthiformis*
8. Corolla magenta to violet, magenta to lilac or occasionally violet, with whitish maculae, tube 9–13 mm long; connective 5.5–6 mm long..... 10. *Salvia itatiaiensis*
- 8'. Corolla red, magenta to reddish or blue to violet, tube 15–40 mm long; connective 9–23 mm long 9
9. Calyx at anthesis 7–9.5 mm long 10
- 9'. Calyx at anthesis 11–32 mm long..... 11
10. Internode 6–8 cm long; leaves glabrous or sparsely puberulous adaxially; superior stigmatic lobe 1.7–2 mm long 11. *Salvia mentiens*
- 10'. Internode 1.8–6 cm long; leaves densely villous; superior stigmatic lobe 2–3.2 mm long 13. *Salvia ombrophila*
11. Calyx bright red, 9-nerved; stamens exerted 15. *Salvia splendens*
- 11'. Calyx totally green or green to purple, violet, black or red, 11–14-nerved; stamens included..... 12
12. Stem and leaves glabrous to puberulous; leaf base attenuate to acute or rounded-attenuate; corolla magenta to reddish..... 13

- 12'. Stem hirsute, tomentose or pubescent to glabrescent; leaf base cordate, subcordate, rounded or truncate; corolla blue to violaceous, purple or bluish..... 14
13. Inflorescence axillary; bracts 8–17 × 2.5–6 mm..... 8. *Salvia articulata*
- 13'. Inflorescence terminal; bracts 15–40 × 3.5–8.5 mm..... 14. *Salvia sellowiana*
14. Corolla tube 20–33.5 mm long, superior lip 10–22 mm long, inferior lip inflexed; inferior stigmatic lobe 1–1.4 mm longer than the superior..... 9. *Salvia guaranitica*
- 14'. Corolla tube 18–20 mm long, superior lip 6–8.5 mm long, inferior lip deflexed; inferior stigmatic lobe 2.1–3.1 mm shorter than the superior..... 12. *Salvia oligantha*

1. *Cunila galioides* Benth. Labiat. Gen. Spec.: 363. 1834. Fig. 1a

Herb or subshrub, terrestrial, prostrate to erect on the flowering apex of the stem branches, up to 0.8 m tall. Stem obtuse-tetragonous, rarely superficially canaliculate when young, glabrous to pubescent or hispid-villous on stem apex, internode 0.2–1 cm long. Leaves fasciculate, sessile, blade 0.2–0.8 × 0.3–0.7 cm, linear-lanceolate to narrow-elliptical, chartaceous, green, slightly discolorous, abaxially lighter, glabrous, punctate-glandular, adaxially glabrous or sparsely pubescent, apex cuneate, base obtuse to cuneate, margin entire or revolute, frequently strigulose. Inflorescence terminal, spiciform thyrses, divided into verticillasters spaced 0.1–0.7 cm apart, 4–12-flowered, peduncle 2–4.1 cm long, sparsely pubescent to villous; bracts of the verticillaster opposite at the base of the inflorescence, green, linear-lanceolate, persistent, apex acute or attenuate, margin entire or shortly ciliate, 3–4 × 0.8–1.3 mm, abaxially glabrous or sparsely hirsute with trichomes concentrated along the midrib, adaxially glabrous, margin ciliate; bracts of the cymules opposite at the base of the inflorescence, similar shape to those of the verticillaster, 2.7–3.3 × 0.6–1 mm, indument similar to those of the verticillaster; bracteoles 3 at the base of the flower, 1 subtending the flower, similar shape to that of the bracts, 1.5–2 × 0.5–0.8 mm, the other 2 opposite at the base of the pedicel, 0.8–1 × 0.3–0.4 mm, indument similar to that of the bracts. Pedicel ca. 0.5 mm long, pilose; calyx dark purple to vinaceous, 13-nerved, campanulate to bilabiate, inconspicuously enlarged in fruit, externally puberulous with ciliate margin, internally with a villous ring of trichomes in the throat, tube erect, campanulate, 1.5–2 mm long, inferior lip 6-nerved, bilobate, deflexed, 1.5–2 mm long, lobes deltate, apex acute, superior lip 7-nerved, trilobate, deflexed, 1.3–1.5 mm long, lobes deltate to lanceolate, apex acute; corolla pinkish to lilac, bilabiate, externally villous, internally villous in

the throat, pubescent with swollen trichomes in tube, tube ascendent, tubular to campanulate, 3.5–4 mm long, inferior lip trilobate, 2.5–3.2 mm long, middle lobe oblong to obovate, erect to inflexed, apex emarginate to obcordate, lateral lobes oblong to orbicular, erect to inflexed, apex obtuse to rounded, superior lip entire, erect, subgaleate, 2–2.5 mm long, oblong, margin entire, apex retuse to emarginate; stamens 2, exserted, inserted between the middle and apical portion of the tube, fertile thecae 2, lilac when young to brownish at dehiscence, oblong-ellipsoid, ca. 0.8 mm long, at the apex of the filament, parallel to shortly divaricate after dehiscence, filament pink, 2.5–3 mm long, glabrous, connective conspicuous at dehiscence, shortly diverging the thecae; style pink to lilac, included to shortly exserted, 3.5–6.5 mm long, glabrous, stigma totally exserted or exserted only at the apex, stigmatic lobes unequal, slightly curved, sulcate, acute, inferior lobe ca. 1 mm long, superior lobe ca. 0.5 mm long, ovary lobes 0.3 mm long, nectary weakly 4-lobed, discoid, ± symmetrical, 0.4 mm long; nutlet brown, ca. 1.5 × 1 mm, ovoid, smooth, glabrous, apex rounded, mucilage not seen.

Material examined: Itatiaia, Parque Nacional do Itatiaia, km 14 on road to Abrigo Rebouças, 22°22'30.7"S, 44°41'53.4"W, 13.III.2009, fl., *F. Almeda et al.* 9788 (SPF); Pedra assentada, 14.II.1935, fl., *P.C. Porto* 2774 (RB); Planalto, 8.III.1945, fl., *F. Segadas-Vianna* 815 (RFA); trilha para o Pico das Agulhas Negras, 10.II.1990, fl., *L. Sylvestre et al.* 287 (RB). Resende, Parque Nacional do Itatiaia, estrada entre Posto Marcão e Abrigo Rebouças, nas margens da estrada, 22°22'29.9"S, 44°41'59.5"W, V.2019, 30.III.2019, fl. and fr., *A.B. Oliveira et al.* 35 (RB).

The species is native to Brazil, occurring in grasslands or less frequently in mixed ombrophilous forests and in Cerrado *lato sensu* within the Atlantic Forest, Cerrado and Pampa domains. In Brazil, it occurs in all states of the South, in most of the Southeast (Minas Gerais, Rio de Janeiro and São Paulo) and in the Central-west (Goiás) (Antar



Figure 1 – a-j. Details of the reproductive structures of *Cunila*, *Hedeoma*, *Hesperozygis*, *Lepechinia*, *Prunella* and *Rhabdocalyon* species – a. *Cunila galioides* – thyrse; b. *Cunila menthiformis* – thyrse; c. *Hedeoma crenata* – stem and cymules; d. *Hesperozygis myrtooides* – stem and cymules; e-f. *Lepechinia speciosa* – e. panicle; f. calyx in fruit; g-h. *Prunella vulgaris* – g. thyrse; h. stamens; i-j. *Rhabdocalyon coccineum* – i. inflorescence; j. flower. Scale bars: a-b = 7 mm; c = 9 mm; d = 14 mm; e = 30 mm; f = 18 mm; g = 11 mm; h = 3 mm; i-j = 20 mm. Photos: a, c-g. Marcelo Trovó; b. Caio Baez; h-j. Hugo Dolsan.

2020a). It was found between ca. 1,900–2,650 m alt., growing along trails in the high-altitude grasslands within the Park, such as those related to the Rebouças and Massena shelters, and the peaks of Pedra Assentada, Agulhas Negras and Prateleiras. Reproductive specimens from INP dates from January to June, August, and November. The combination of strong scent and fasciculate leaves (similar to *Galium* L., Rubiaceae) makes the species easy to recognize. It can still be found in herbaria by its synonym *Hedeoma glaziovii* Briq.

2. *Cunila menthiformis* Epling, Repert. Spec. Nov. Regni Veg. Beih., 85: 141. 1936. Fig. 1b

Herb or subshrub, terrestrial, erect to occasionally prostrate at the base, up to 1 m tall. Stem obtuse-tetragonous, often superficially canaliculate, sparsely pubescent or villous, internode 0.6–4.8 cm long. Leaves decussate, petiole 0.1–0.4(–0.6) cm long, canaliculate, blade 0.9–2.5(–3) × 0.5–1.5(–1.8) cm, elliptical to obovate or rarely ovate, membranous to sub-chartaceous, green, discolorous, abaxially lighter, hirtellous mostly on veins, inconspicuously punctate-glandular, adaxially glabrous or sparsely puberulous along the blade margin, apex mucronate, obtuse or rarely cuneate, base attenuate, cuneate or rarely rounded-attenuate to obtuse, margin serrate. Inflorescence terminal, spiciform thyse divided into verticillasters, spaced 0.2–0.3 cm apart, 8–24-flowered, peduncle 1–7.4 cm long, villous, followed by 1–3 axillary verticillasters spaced 0.8–1.5(–3.1) cm apart, similar density of flowers to those forming thysses; bracts opposite at the base of the verticillaster, linear-lanceolate to narrow-elliptical, persistent, apex acute, 2.5–4 × 1–1.3 mm long, surfaces glabrous or abaxially hirsute along the midrib, margin ciliate; bracteoles fasciculate at the base of the verticillaster or subtending the flowers, blade 1.5–2 × 0.5–0.8 mm, similar shape to that of the bracts, glabrous or hispidulous along the midrib, margin entire or shortly ciliate. Pedicel 0.5–1 mm long, hispid or hirtellous; calyx green with violet maculae, 13-nerved, campanulate to bilabiate, inconspicuously enlarged in fruit, externally hispidulous to villous, internally with villous ring on the throat, tube erect, tubular to campanulate, 1.5–2 mm long, inferior lip 6-nerved, bilobate, erect, 1.2–1.8 mm long, lobes lanceolate, apex acute, superior lip 7-nerved, trilobate, slightly deflexed, 0.8–1.4 mm long, lobes deltate, apex acute; corolla white to rarely pinkish with violaceous maculae on the inferior lip into the

tube, bilabiate, externally villous, internally with villous throat, pubescent with swollen trichomes projecting from the division of the inferior lip into the tube, tube erect to shortly ascendent, tubular to campanulate, 4–5 mm long, inferior lip trilobate, 0.9–1.8 mm long, middle lobe orbicular to oblong, inflexed at the apex, apex emarginate, lateral lobes orbicular, inflexed at the apex, apex rounded, superior lip entire, erect, concave, 1.2–2 mm long, oblong, margin entire, apex retuse to emarginate; stamens 2, exserted, inserted between the middle and superior portion of the tube, fertile thecae 2, white to brown, oblong-ellipsoid, ca. 0.7 mm long, at the apex of the filament, shortly divaricate, filament whitish, 2.5–3.5 mm long, glabrous, connective conspicuous, shortly diverging the thecae; style shortly exserted, 3.6–6.6 mm long, glabrous, stigmatic lobes unequal, slightly curved, sulcate, acute, superior lobe ca. 0.5 mm long, inferior lobe ca. 1 mm long, ovary lobes 0.3 mm long, nectary weakly 4-lobed, discoid, ± symmetrical, 0.7 mm long; nutlet brown, ca. 1.5 × 1 mm, ovoid, smooth or punctulate, glabrous, apex rounded, mucilage not seen.

Material examined: MINAS GERAIS: Engenheiro Passos, Parque Nacional de Itatiaia, Descida do Planalto, 22.I.2003, fl., *V.F. Mansano et al.* 183 (HUEFS, RB). RIO DE JANEIRO: Itatiaia, BR-354, 24.I.1987, fl., *T.B. Cavalcanti et al.* 3 (IPA, K, SPF); estrada nova, km 8, 21.II.1948, fl. and fr., *A.C. Brade 18903* (ESA, K, RB); estrada Registro-Planalto, estrada para Agulhas Negras, km 8-10, 17.I.1979, fl., *P. Occhioni 8693* (K, RFA).

The species is native to the Atlantic Forest of Minas Gerais, Rio de Janeiro, and states of the South of Brazil, being found in high-altitude grasslands and in gallery, riverine, and ombrophilous forests (Antar 2020a). Within INP, it has been recorded between ca. 2,000–2,300 alt., along the roadsides of the high-altitude grasslands to Agulhas Negras and Prateleiras Peaks and near the Agulhas Negras Peak. Reproductive specimens from INP date from January, February, and April. It is strongly aromatic. It can be differentiated from *Cunila galioides* by the shape of its leaves (elliptical to obovate or rarely ovate with serrate margin in *Cunila menthiformis* vs. linear-lanceolate to narrow-elliptical with entire margin in *C. galioides*) and the density of the verticillasters (10–26-flowered vs. 4–12-flowered).

3. *Hedeoma crenata* R.S. Irving, Britt. 22(4): 344. 1971. Fig. 1c

Herb or subshrub, terrestrial, prostrate to erect on the flowering apex of the stem branches, up to

0.3 m tall. Stem obtuse-tetragonous, superficially canaliculate when young, puberulous to pubescent, internode 0.2–1.8 cm long. Leaves decussate, petiole 0.1–0.45 cm long, villous, canaliculate, blade 0.3–0.8 × 0.3–1.1 cm, ovate to rounded, membranous, green, slightly discoloured, abaxially lighter, glabrous to hirtellous along veins and blade margin, punctate glandular, adaxially glabrous or sparsely puberulous apex obtuse to retuse, base rounded, obtuse, or less frequently cuneate, margin crenate. Inflorescence axillary, cymules on the stem apex, 1–3-flowered, peduncle 0.1–0.2 cm long, villous; bracts opposite at the base of the cymule, individually subtending the lateral flowers, completely green or vinaceous to violet at the base, ca. 1.2 × 0.5 mm, linear-lanceolate, persistent, apex obtuse, surfaces glabrous, margin ciliate; bracteoles opposite on the pedicel, 0.5–1 × 0.2–0.3 mm, similar shape to that of the bracts. Pedicel 2–3(–5) mm long, villous; calyx dark violet or vinaceous to violet externally, green on the interior of the tubes, 13-nerved, bilabiate, conspicuously enlarged in fruit, externally pronouncedly striate, hirtellous with ciliate margin, internally with villous ring on the throat, tube erect, tubular to campanulate, saccate mostly on the inferior portion, 1.7–2.5 mm long, inferior lip 6-nerved, bilobate, inflexed, 1.5–2 mm long, lobes narrow-deltate, apex acute, superior lip 7-nerved, trilobate, deflexed, 1.2–1.7 mm long, lobes deltate to lanceolate, apex cuneate to obtuse; corolla white with violet maculae on the throat and tube interior, bilabiate, externally pubescent, internally villosulous in the throat and tube, tube erect, campanulate, 2.5–4 mm long, inferior lip trilobate, 1.8–2.5 mm long, middle lobe orbicular to obcordate, erect to inflexed, apex obcordate, lateral lobes orbicular, erect to inflexed, apex obtuse to rounded, superior lip entire, erect to slightly deflexed, plain to concave, 1.4–2 mm long, orbicular to oblong, margin entire, apex emarginate; stamens 2, included, inserted between the middle and superior portion of the tube, fertile thecae 2, white, ellipsoid, ca 0.5 mm long, at the apex of the filament, divaricate, filament white or slightly lilac, 1.7–2 mm long, glabrous, connective conspicuous, diverging the thecae; style white, included, 2–4.5 mm long, glabrous, stigma included or shortly exerted, stigmatic lobes unequal, curved, sulcate, acute, superior lobe ca. 0.5 mm long, inferior lobe ca. 1 mm long, ovary lobes 0.3 mm long, nectary 4-lobed, discoid, ± symmetrical, 0.4 mm long; nutlet brown, 1–1.2 × 0.7–0.8 mm, ovoid to globose, glabrous, reticulate, superficially

ruminate, occasionally punctulate, apex rounded, mucilage absent.

Material examined: Itatiaia, estrada nova, km 10-11, 28.IV.1952, fl., *P. Occhioni 1315* (P, RFA); km 15, V.1950, fl., *A.C. Brade 20278* (ESA, RB); Parque Nacional do Itatiaia, Agulhas Negras, 30.V.1969, fl., *D. Sucre & T. Plowmann 5142* (RB, US); Serra de Itatiaia, III.1894, fl. and fr., *E.H.G Ule 199* (R). Resende, Parque Nacional do Itatiaia, estrada entre Brejo da Lapa e Posto Marcão, nas margens da estrada, próximo a barranco, 22°21'48.84"S, 44°43'37.96"W, 30.X.2017, fl. and fr., *A.B. Oliveira et al. 15* (RB); 22°21'53.82"S, 44°43'31.29"W, 29.XI.2018, fl. and fr., *A.B. Oliveira et al. 23* (RFA); Pedra do Altar na sombra de Bambusoideas, III.1937, fl., *A.C. Brade 15669* (MBML, RB); Serra dos Órgãos, 19.II.1932, fl., *A.C. Brade 11500* (RB).

Additional material: BRAZIL. MINAS GERAIS: Campos de Caparaó, 9.II.1890, fl. and fr., *C.A.W. Schwacke* (R 34976). RIO DE JANEIRO: Serra dos Órgãos, 19.II.1932, fl., *A.C. Brade 11500* (RB).

The species is endemic to the mountain ranges in Minas Gerais and Rio de Janeiro, being limited to the Caparaó grasslands in Minas Gerais and to the INP and Serra dos Órgãos National Park in Rio de Janeiro. Within INP, it is found between ca. 2,000–2,500 m alt., mostly along roadsides within high montane forests or high-altitude grasslands, such as on the roads to Abrigo Rebouças and Agulhas Negras Peak, as very limited populations (Brade 1943; Irving 1980). Reproductive material from INP dates from November to June, and August. It has a subtle scent and can be differentiated from other regional *Menthinae* due to its markedly inflexed inferior lobes of the calyx with saccate tube and rounded leaves. It is still frequently found in collections under the synonyms *Cunila montana* Brade ex Epling, *Pseudocunila montana* Brade, or *Hedeoma polygalifolia* var. *montana* Dusén. Illustrations can be found in Brade (1943).

4. *Hesperozygis myrtilloides* (A.St.-Hil. ex Benth.) Epling, Repert. Spec. Nov. Regni Veg. Beih. 85: 132, 133. 1936. Fig. 1d

Subshrub to shrub, terrestrial, erect, up to 1.5 m tall. Stem obtuse-tetragonous, rarely canaliculate when young, strigose to tomentose, internode 0.2–1.4 cm long. Leaves decussate, petiole 0.2–0.3(–0.4) cm long, strigose to tomentose, channels absent, blade 0.7–1.7 × 0.4–0.9 cm, obovate to elliptical or rarely ovate, subchartaceous, green, discoloured, abaxially lighter, tomentose mostly on veins, punctate-glandular, adaxially scabrous, often puberulous on the blade margin, apex cuneate, obtuse or rarely retuse, base obtuse, cuneate or attenuate, margin crenulate or rarely serrate.

Inflorescence verticillasters at the apex of the stem branches, spaced 0.2–0.7 cm apart, 2–6-flowered; bracts opposite at the base of the cymule, green or slightly dark purple to vinaceous, blade 3–4.1 × 1–1.8 mm, lanceolate or linear-lanceolate, subpersistent, apex acute to acuminate, abaxially glabrous or strigulose along the midrib, adaxially glabrous, margin entire or ciliate; bracteoles opposite at the base of the pedicels, blade 1.5–2.5 × 0.5–1 mm, similar shape and indument to those of the bracts, deciduous. Pedicel 1–3 mm long, villous; calyx green at the base, slightly dark purple to vinaceous mainly near the apex, 13-nerved, tubular-turbinate to subtly bilabiate, inconspicuously enlarged in fruit, externally pronouncedly striate, pubescent mostly on veins with ciliate margin, internally with tomentose ring on the throat, tube erect, tubular, 3–5.5 mm long, inferior lip 6-nerved, bilobate, deflexed, 3–3.5 mm long, lobes deltate, apex acute, superior lip 7-nerved, trilobate, deflexed, 2.7–3.2 mm long, lobes similar; corolla lilac, bilabiate, externally tomentulose, internally pubescent with swollen, often glandular trichomes forming two lines projecting from the division of the inferior lip into the tube, tube ascendent, tubular to campanulate, 9–11 mm long, inferior lip trilobate, 3.9–4.5 mm long, middle lobe obcordate to reniform, deflexed with apex frequently inflexed, apex emarginate, lateral lobes oblong to orbicular, inflexed at apex, apex obtuse, superior lip entire, erect to deflexed, concave, 3.7–4.1 mm long, oblong to obcordate, margin shortly involute, apex strongly emarginate; stamens 2, included, inserted in the middle portion of the tube, fertile thecae 2, lilac to blackish, oblong-ellipsoid, ca. 1.2 mm long, at the apex of the filament, divaricate at 180°, filament lilac, ca. 6 mm long, glabrous, connective dilated, diverging the thecae; style lilac, included, 9.9–13.4 mm long, glabrous, stigma included to shortly exerted, stigmatic lobes unequal, slightly curved, sulcate, acute, superior lobe ca. 1 mm long, inferior lobe ca. 1.7 mm long, ovary lobes 0.3 mm long, nectary 4-lobed, discoid, ± symmetrical, ca. 0.7 mm long; nutlet brown, 1.5–1.7 × 1 mm, ovoid to ellipsoid, glabrous, coated with granular pellicle, apex rounded, slightly mucilaginous.

Material examined: MINAS GERAIS: Itamonte, road from Garganta do Registro to Abrigo Rebouças and Parque Nacional do Itatiaia, between km 6 and km 13, 22°22'22.116"S, 44°42'14.256"W, 13.III.2009, fl., *F. Almeda et al.* 9808 (CAS-BOT, SPF, UEC). RIO DE JANEIRO: Itatiaia, III.1937, fl., *A.C. Brade* 15638

(RB); Parque Nacional do Itatiaia, km 19, 12.III.1947, fl., *P. Occhioni* 916 (RFA); Planalto do Itatiaia, subida das Agulhas Negras, 6.II.1969, fl., *D. Sucre* 4641 (K, RB); Prateleiras, 14.II.1935, fl., *C. Porto* 2772 (RB). Resende, Parque Nacional do Itatiaia, estrada entre Posto Marcão e Abrigo Rebouças, nas margens da estrada, 22°22'30.49"S, 44°41'58.37"W, 30.III.2019, fl. and fr., *A.B. Oliveira et al.* 33 (RB, RFA); estrada para Prateleiras, 17.I.1985, fl., *H.C. De Lima et al.* 2543 (RB); Planalto do Itatiaia, trilha entre abrigo Rebouças e início da travessia Ruy Braga, 22°23'24"S, 44°40'23"W, 12.II.2019, fl., *D.R. Couto & M.M. Moreira* 4304 (RB).

The species is endemic to high-altitude grasslands along the mountain ranges of the Brazilian Southeast (Epling 1936; Flora do Brasil 2020, continuously updated). It is found between ca. 2,000–2,650 m alt., dispersed along most of the trails of this type of vegetation in INP, such as near Abrigo Rebouças, on the way to Agulhas Negras and Prateleiras Peaks. This species has high value for conservation plans, since *Hesperozygis* is an endemic genus of the Brazilian Atlantic Forest and Pampa Domains (Antar & Oliveira 2021). Reproductive material from INP dates from November to July. It can be quickly differentiated from other species by its calyx with similar lobes and turbinate apex. It is highly aromatic, with a scent similar to *Mentha* spp. Some specimens can be found identified in herbaria under the synonym *Glechon myrtoides* A.St.-Hil ex Benth.

5. *Lepechinia speciosa* (A.St.-Hil. ex Benth.) Epling, Repert. Spec. Nov. Regni Veg. Beih., 85: 21. 1935. Fig. 1e-f

Subshrub or shrub, terrestrial, erect, up to 2 m tall. Stem tetragonous, canaliculate when young, rufous-tomentose, internode 0.5–4.5 cm long. Leaves decussate, petiole 0.7–2.5(–4.5) cm long, rufous-tomentose, canaliculate, blade 3.2–15.5 × 1.1–6.3(–7.5) cm, ovate, lanceolate, less frequently elliptical or oblong, membranous to chartaceous, green or olivaceous, discolorous, abaxially lighter, densely tomentose to lanuginose, adaxially bullate, often pubescent on the veins, apex subacute to acute, base sagittate, cordate or truncate, margin crenulate to crenate. Inflorescence terminal, paniculate, racemes opposite, divided into pseudowhorls spaced 0.8–3.3 cm apart, 2–4-flowered, peduncle of the main axis 13–24 cm long, branching axes 3–16 cm long, pubescent to tomentose; bracts opposite at the base of the pseudowhorl or subtending the racemes individually, dark purple to green, blade 3.5–5.9 × 2–2.6 mm, ovate to lanceolate, apex acute to acuminate, the ones near the base with indument

similar to that of the leaves, the ones near the apex abaxially villous to tomentose, adaxially glabrous, margin entire or crenulate. Pedicel 4–8 mm long, pubescent to tomentose; calyx dark purple to vinaceous, 10–14-nerved, campanulate to weakly bilabiate, 7.6–13 mm long at anthesis, 16–21 mm long in fruit, externally pubescent to tomentulose with trichomes concentrated on veins and margin, internally glabrous, tube erect, campanulate, 4.3–11 mm long, inferior lip 3–6-nerved, bilobate, erect to inflexed, 3.3–10 mm long, lobes narrow-deltate, apex acuminate, superior lip 5–8-nerved, similar shape, bilobate, erect to slightly deflexed; corolla magenta to violet, tubular to bilabiate, externally glabrescent to puberulous, internally with pilose ring at the base, tube erect, tubular, enlarged at the base, subgibbous at the base of the superior surface, 14.5–30 mm long, inferior lip trilobate, 3–5 mm long, middle lobe orbicular, erect to slightly deflexed, apex emarginate, lateral lobes orbicular, slightly deflexed, apex obtuse to rounded, superior lip bilobate, erect to deflexed, concave, 2–3.1 mm long, lobes orbicular to oblong, margin entire, apex obtuse to rounded; stamens 4, anterior pair included to shortly exerted, posterior pair included, inserted near the apex of the tube, fertile thecae 2, dark purple to black, oblong-ellipsoid, ca. 2.5 mm long, at the apex of the filament, divaricate, filaments magenta, anterior pair 6.5–9 mm long, posterior pair 3.7–5 mm long, glabrous or glabrescent with short trichomes at the base, connective conspicuous, diverging the thecae; style pink to magenta, shortly exerted, 17–33.1 mm long, glabrous, stigmatic lobes subequal, slightly curved, flat, acute, ca. 1 mm, ovary lobes 0.5 mm long, nectary 4-lobed, discoid, symmetrical, ca. 1 mm long; nutlet amber or dark brown, 2.6–3.5 × 1.9–2.6 mm, oblong-ovoid, smooth, glabrous, apex rounded, mucilage absent.

Material examined: MINAS GERAIS: Itamonte, Parque Nacional do Itatiaia, próximo à chegada no Posto Marcão, 22°22'21.05"S 44°42'16.27"W, 30.III.2019, fl. and fr., *A.B. Oliveira 34* (RB); road from Garganta do Registro to Abrigo Rebouças and Parque Nacional do Itatiaia, between km 6 and km 13, 22°22'22.1"S 44°42'14.3"W, 13.III.2009, fl. and fr., *F. Almeda et al. 9818* (SPF, UEC). RIO DE JANEIRO: Itatiaia, km 18-19, 31.I.1935, fl., *P. Campos-Porto 2740* (RB); Parque Nacional do Itatiaia, estrada para a parte alta do Parque, 25.V.2013, fl., *M.L.O. Trovó et al. 596* (RB); Prateleiras, 8.V.1975, fl., *A.M. Camerik 17* (RB). Resende, Planalto do Itatiaia, trilha para Prateleiras após entrada para travessia Ruy Braga, 22°23'44"S, 44°40'12"W, 12.II.2019, fl. and fr., *D.R. Couto & M.M. Moreira 4290*

(CAP, RB, SPF); trilha para Prateleiras, 9.II.2004, fl., *R.B. Moura 234* (RFA).

Endemic species to high-altitude grasslands of the montane regions of the Brazilian Southeast within the Atlantic Forest. *Lepechinia speciosa* is one of two *Lepechinia* species in Brazil (Antar *et al.* 2019). Within the INP, it can be found between ca. 1,900–2,650 alt., in the plains nearby entrances to the forest, such as near Abrigo Rebouças, and along the trails to Agulhas Negras peak. Reproductive material from INP dates from December to July, September, and October. It is one of the most conspicuous species of Mentheae in the area, presenting a strong scent, vivid magenta to violet flowers and leaves with the base sagittate, truncate or cordate, which also explains its common name “Orelha-de-burro”.

6. *Prunella vulgaris* L. Sp. Pl.,: 600. 1753.

Fig. 1g-h

Herb, terrestrial, prostrate to erect at the flowering apex of the stem branches, up to 0.6 m tall. Stem tetragonous, canaliculate, glabrescent to pilose, internodes (0.7–)1.0–7.7(–10) cm long. Leaves decussate, petiole 0.3–2.5 cm long, pilose or pubescent, deeply canaliculate, blade (0.9–)1.3–5.9(–7.2) × (0.4–)0.7–3.5 cm, ovate, elliptical or lanceolate, membranous, completely green or vinaceous along the margin and apex, discolorous, abaxially lighter, pilose, villous or pubescent, adaxially sparsely pubescent or glabrous, apex acute, less frequently subacute, base truncate, rounded or cuneate, margin ciliate, dentate, repand or entire. Inflorescence terminal, spiciform thyrses, divided into pseudowhorls spaced 0.2–0.6 cm apart, 6-flowered, peduncle 1.5–6 cm long, pubescent; bracts subtending the flower, vinaceous to purplish with green base, blade 5–8 × 6–12 mm, orbicular to reniform, persistent, apex strongly acuminate or caudate, abaxially hispid along the blade margin, adaxially glabrous to puberulous, margin ciliate. Pedicel 1–1.5 mm long, pubescent to pilose; calyx vinaceous to purplish with green base, 10-nerved, bilabiate, enlarged in fruit, externally hispid on the inferior and lateral surface, internally glabrous, tube slightly inflexed, campanulate, 3–4 mm long, inferior lip 5-nerved, bilobate, inflexed, 3–4 mm long, lobes deltate, apex acute, superior lip 5-nerved, trilobate only at the apex, erect to deflexed, 4–5 mm long, lobes rotund, middle lobe mucronate, lateral lobes apiculate; corolla lilac to violaceous, bilabiate, externally hirsute on the superior lip, internally glabrous, tube erect, tubular

to campanulate, gibbous closer to the apex on the inferior portion, 6–8 mm long, inferior lip trilobate, inflexed, 1.5–2 mm long, middle lobe orbicular or reniform, inflexed at apex, apex emarginate to obcordate, lateral lobes orbicular, erect, apex obtuse, superior lip entire, strongly inflexed with apex deflexed, galeate, subgibbous on the superior portion, 3–4 mm long, oblong, margin shortly involute at the base, apex strongly emarginate; stamens 4, included in the galea, anterior pair inserted between the middle and basal portion of the tube, posterior pair inserted at the tube apex, fertile thecae 2, lilac to violaceous, ellipsoid, ca. 1 mm long, lateral to the filament, forming a bifurcation with a subulate appendage, shortly divaricate, filament violaceous or lilac, anterior pair 6–7 mm long, posterior pair 2–3 mm long, glabrous, connective slightly conspicuous; style violaceous or lilac, included or exerted, 7.3–12.1 mm long, glabrous, stigma shortly exerted or totally exerted, stigmatic lobes subequal, curved or circinate, subulate, ca. 1.8 mm long, ovary lobes 0.6 mm long, nectary without lateral lobes, discoid, symmetrical, 0.7 mm long; nutlet brown with lighter-colored angles, 2–2.5 × 1.3–1.5 mm, oblong to ellipsoid, smooth, glabrous, apex obtuse to rounded, slightly mucilaginous.

Material examined: MINAS GERAIS: Itamonte, Parque Nacional do Itatiaia, estrada entre Garganta do Registro e Brejo da Lapa, nas margens da estrada, 22°22'24.29"S, 44°45'20.92"W, 30.X.2017, fl. and fr., *A.B. Oliveira et al.* 13 (RB). RIO DE JANEIRO: Itatiaia, Parque Nacional do Itatiaia, estrada para o Pico das Agulhas Negras, 22°15'–22°28'S, 44°34'–44°45'W, 15.II.1995, fl., *J.M.A. Braga et al.* 2027 (RB); Macieiras, 15.III.1975, fl., *P. Occhioni* 7059 (P, RFA); trilha da Maromba, 23.I.2003, fl., *V.F. Mansano et al.* 203 (RB); subida para o Planalto, km 15, III.1945, fl., *F. Segadas-Vianna* 760 (RFA). Resende, Planalto do Itatiaia, trilha para Pedra da Maçã/Tartaruga e Pedra Assentada, 22°23'53"S, 44°40'13"W, 20.VII.2018, fl., *D.R. Couto et al.* 3826 (RB).

The species is native to Asia, Europe, and North America, but naturalized along mountain ranges of the Southeast and in the South of Brazil within the Atlantic Forest Domain, occurring also in many continents due to cultivated specimens (Epling 1936; Psotová *et al.* 2003; Antar 2020b). Within the INP, it was found between ca. 1,700–2,450 m alt., spread through many humid areas near roadsides within high montane forests, such as near the marsh Brejo da Lapa and Macieiras shelter. Reproductive material from INP dates every month of the year except for November. It

has many therapeutic properties associated with its mildly aromatic aspect (Psotová *et al.* 2003). Even though this species presents high morphological variation in its stem and leaves, it can be easily differentiated from other local species due to its comparatively large, orbicular to reniform bracts, subulate apex of the filament and strongly angulate fruits. It is commonly named in collections with the orthographic variant *Brunella* L.

7. *Rhabdocalyon coccineum* (Benth.) Epling, Repert. Spec. Nov. Regni Veg. Beih. 85: 135. 1936.

Fig. 1i-j

Herb, terrestrial, erect, up to 2 m tall. Stem acutely tetragonous, deeply canaliculate, glabrous to strigose in lines at apex, internode 0.8–6.8(–7.6) cm long. Leaves decussate, sessile, blade 0.9–2.5 × 0.2–0.6 cm, linear-lanceolate to narrow-elliptical, chartaceous, green to abaxially dark red to purple on the midrib and base, discolorous, abaxially lighter, glabrous, punctate-glandular, adaxially glabrous, frequently punctate-glandular, apex subacute, acute or less frequently retuse, base obtuse, cuneate or attenuate, margin entire or revolute. Inflorescence terminal, thyrsoid, peduncle 4–11 cm long, strigose in 4 lines, divided into pseudowhorls, cymules 1–5-flowered, spaced 0.6–3 cm apart, peduncle 0.2–1.1 cm long, hirtellous to hirsute; bracts of the pseudowhorl opposite at the base of the inflorescence, green with dark purple to vinaceous midrib, 4–20 × 0.9–4.5 mm, similar shape and indument to those of the leaves, persistent; bracts opposite at the base of the cymules, green with dark purple to vinaceous midrib, blade 3–7 × 0.7–1.8 mm, linear-lanceolate or lanceolate, persistent, apex obtuse to acute, surface glabrous, margin entire or shortly ciliate; bracteoles opposite on the pedicel, blade 2–3.5 × 0.4–0.8 mm, similar shape to that of the bracts, surface glabrous, margin entire or shortly ciliate. Pedicel (1–)3–7 mm long, hirsute; calyx dark red to purplish or vinaceous, 13-nerved, bilabiate, conspicuously enlarged in fruit, externally pronouncedly striate, hirtellous mostly on veins with ciliate margin, internally with throat glabrescent to sparsely hirtellous, tube erect, tubular, subgibbous on the inferior portion, 6–7 mm long, inferior lip 6-nerved, bilobate, erect to slightly inflexed, 2.6–3.2 mm long, lobes lanceolate, apex acute, superior lip 7-nerved, trilobate, slightly deflexed, 2.5–3 mm long, lobes lanceolate, apex subacute; corolla scarlet, bilabiate, externally pubescent, internally glabrous, tube erect to shortly ascendent, tubular, 18–28 mm long, inferior lip trilobate, deflexed with

apex frequently inflexed, 4–5 mm long, middle lobe obcordate to oblong, apex truncate-emarginate, lateral lobes oblong, erect or slightly deflexed, apex truncate or obtuse to rounded, superior lip entire, erect to deflexed, plain to concave, 3–5 mm long, oblong, margin entire, apex strongly emarginate; stamens 2, exserted to included, inserted between the middle and basal portion of the corolla, fertile thecae 2, vinaceous to dark brown or blackish, oblong-ellipsoid, ca. 1.2 mm long, at the apex of the filament, divaricate, filament scarlet, 20–23 mm long, glabrous, connective dilated, widely diverging the thecae; style scarlet, exserted, 22–34 mm long, glabrous, stigmatic lobes unequal, curved, sulcate, acute, superior lobe ca. 1.2 mm long, inferior lobe ca. 1.5 mm long, ovary lobes 0.5 mm long, nectary 4-lobed, discoid, symmetrical, ca. 0.8 mm long; nutlet brown to dark brown, 1.6–2.3 × 1.2–1.8 mm, oblong-ellipsoid, smooth, glabrous, apex rounded, mucilage absent.

Material examined: Itatiaia, Posto Meteorológico, Planalto, III.1945, fl. and fr., *F. Segadas-Vianna* 773 (RFA); Serra da Mantiqueira, 3.III.1931, fl., *R.W. Kaempfe* 415 (RB). Resende, Parque Nacional do Itatiaia, trilha para o Pico das Prateleiras, próxima a afloramento rochoso, 22°23'26.18"S, 44°40'20.15"W, 4.V.2017, fl., *A.B. Oliveira et al.* 1 (RB); Planalto do Itatiaia, trilha para Prateleiras após entrada para travessa Ruy Braga, 22°23'44"S, 44°40'12"W, 12.II.2019, fl., *D.R. Couto & M.M. Moreira* 4298 (RB); Serra do Itatiaia, 1953, fl. and fr., *F. Segadas-Vianna* 1203 (RFA).

Additional material: BRAZIL. MINAS GERAIS: Lieux marécageux dans la Serra da Ibitipoca, 1816, fl., *A. Saint-Hilaire* D 203 (P). Catas Altas, RPPN Santuário do Caraça, subida para o Pico do Inficionado, 20°08'04"S, 43°27'48"W, 8.XII.2008, fl., *C.T. Oliveira et al.* 233 (BHCB, RB). Lima Duarte, Parque Estadual do Ibitipoca, entre Lombada e Lagoa Seca, 21.XI.2006, fl., *R.C. Forzza et al.* 4332 (MBM, RB, SPF). Santo Antônio do Itambé, Parque Estadual do Itambé, topo do Pico do Itambé, próximo à antena de retransmissão, 18°23'56.2"S 43°20'56"W, 10.II.2009, fl., *J.R. Pirani et al.* 5922 (RB, SPF).

The species is endemic to high-altitude grasslands and highland rocky savannas in the Brazilian Southeast, except for Espírito Santo state, within the Atlantic Forest and Cerrado domains, respectively (Antar 2020c). It was found in the INP between ca. 1,900–2,700 m alt., along the trails to the Massena Shelter, and to the Agulhas Negras and Prateleiras Peaks, mainly associated with water bodies. Reproductive material from INP dates from December to June. This species stands out for its tubular, scarlet corolla, which is unusual for *Menthinae*.

8. *Salvia articulata* Epling, Repert. Spec. Nov. Regni Veg. Beih., 85(2):113. 1936.

Shrub, terrestrial, erect, up to 4 m tall. Stem tetragonous, canaliculate, glabrous or pubescent at the nodes, internode 1.6–8 cm long. Leaves decussate, petiole 0.8–3.2 cm long, glabrous or sparsely puberulous, canaliculate, blade 5.2–15(–20.1) × 1.6–5.7(–8.0) cm, elliptical to lanceolate, subchartaceous, totally green or green with vinaceous to brownish petiole, discolorous, abaxially lighter, surfaces glabrous or puberulous especially along the margin of the blade, apex acute to acuminate, base attenuate to acute or rounded-attenuate, margin serrate. Flowers solitary or less frequently in axillary, cymules 1–2(–3)-flowered, sessile to 1 mm long; bracts opposite at the base of the cymule, green, blade 8–17 × 2.5–6 mm, ovate, deciduous, apex acuminate to caudate, abaxially glabrous to puberulous, adaxially glabrous, margin entire to ciliate; bracteoles opposite at the base of the pedicel, green, 4–6 × 1.5–2.5 mm, lanceolate, deciduous, apex acuminate, abaxially puberulous, adaxially glabrous, margin ciliate. Pedicel 3–7 mm long, glabrous or puberulous; calyx green or green with reddish to magenta apex, pronouncedly striate, 13–14-nerved, bilabiate, 14–25 mm long at anthesis, 17–26 mm long in fruit, externally glabrous or sparsely hispidulous mainly along the margin, internally strigulose, tube erect, tubular, 10–17 mm long, inferior lip 6–7-nerved, bilobate, deflexed at apex, 3.5–7.5 mm long, lobes ovate, apex acuminate, superior lip 7-nerved, entire, erect to inflexed at apex, 4–9 mm long, ovate to occasionally lanceolate, apex shortly acuminate; corolla magenta to reddish, bilabiate, externally pubescent to villous with higher density of trichomes on the superior lip, internally glabrous, tube erect, tubular, subgibbous closer to the apex on the inferior portion, 28–45 mm long, inferior lip trilobate, recurved, 6–14 mm long, middle lobe oblong to obcordate, deflexed, apex emarginate to obcordate, lateral lobes oblong, deflexed, apex obtuse, superior lip entire, slightly incurved, galeate, subgibbous on the superior portion, 8–16 mm long, oblong, margin revolute, apex emarginate; stamens 2, included, inserted near the apex of the tube, fertile theca 1, light yellow, oblong, ca. 4 mm long, lateral to the filament, parallel, filament whitish, 4.5–6 mm long, glabrous, apex obtuse, connective elongate, 12–22 mm long, upper branch linear, lower branch linear, concave, 6–11 mm long, interior margins fused in an articulation except at the lower apex, apophysis absent; style white to pink, exserted,

40–60 mm long, villous, stigmatic lobes unequal, curved, narrowly sulcate to flat at the apex, superior lobe flagelliform, 2.7–4.3 mm long, inferior lobe subulate, 1.5–2.5 mm long, ovary lobes ca. 2 mm long, nectary 4-lobed, discoid, asymmetric, disc base ca. 1.5 mm long, anterior lobe ca. 3.5 mm long; nutlet brown, 3–3.5 × 2 mm, oblong-ovoid to ellipsoid, smooth, glabrous, apex obtuse, mucilage not seen.

Material examined: Resende, Parque Nacional de Itatiaia, estrada para o planalto, próximo ao lago, 9.X.1981, fl., *G. Martinelli et al.* 7754 (RB).

Additional material: BRAZIL. MINAS GERAIS: Caldas, 15.V.1874, fl., *C.W.H. Mosén* 1922 (P, S). SÃO PAULO: BANANAL, Sertão do Rio Vermelho, Serra da Bocaina, 20.VII.1937, fl., *A.C. Brade* 15897 (RB). Piracicaba, Horto do Departamento de Botânica, 24.IV.1985, fl., *V.J. Arai* (ESA 6127, MBM 189319, PEL 16562, UEC 81268). São Paulo, IV.1941, fl., *W. Hoehne* (IPA 52281, K 1225262, MBM 129466, RB 370972, SPF 10737); Serra da Bocaina, 14.V.1951, fl. and fr., *A.C. Brade* 20975 (RB).

The species belongs to *S.* sect. *Nobiles* (Benth.) Epling. Endemic to the gallery, riverine, and ombrophilous forests in Minas Gerais, Rio de Janeiro, and São Paulo states (Oliveira *et al.* 2021). In INP, it was found between ca. 600–2,000 m alt., near roadsides in the montane forest. Reproductive material from INP dates from July and October to December. The species stands out for its robust individuals possessing large flowers. Among the *Salvia* species found in INP, *S. articulata* has many similarities with *S. sellowiana* due to the highly similar flowers and stem, but the former presents solitary flowers or axillary cymes, while the latter has terminal thyrses and usually longer (> 17 mm) bracts (Epling & Toledo 1943; Santos & Harley 2004).

9. *Salvia guaranitica* A.St.-Hil. ex Benth., Labiat. Gen. Spec.: 298. 1833.

Subshrub, terrestrial, erect, up to 2 m tall. Stem tetragonous, canaliculate, glandular-pubescent to glabrescent, internodes 3–9.2 cm long. Leaves decussate, green, discolor, abaxially lighter, ovate, membranous or adaxially rugose, petiole 0.5–5 cm long, pubescent, canaliculate, apex acute to acuminate, base subcordate, truncate or rounded, margin crenate to serrate, blade 2–15 × 1–7 cm, abaxially pubescent, adaxially hirtellous with trichomes concentrated on veins. Inflorescence terminal, thyrses divided into pseudowhorls distanced by 0.4–2.1 cm long, 3–12-flowered, peduncle 10–30 cm long, glandular-pubescent

to glabrescent; bracts opposite at the base of the pseudowhorl, ovate to lanceolate, deciduous, apex acuminate, surface pubescent, margin ciliate, blade 4–15 × 1.5–7 mm. Pedicel 2–6 mm long, pubescent; calyx totally green or green to dark violaceous or blackish, 14-nerved, bilabiate, 8–18 mm long at anthesis, 12–20 mm long in fruit, externally pubescent with glandular trichomes, internally glabrous to strigulose at the upper portion, tube erect, tubular, 6–11 mm long, inferior lip 7-nerved, bilobate, erect to slightly inflexed at the apex, 2–6 mm long, lobes lanceolate, apex acuminate, superior lip 7-nerved, entire, erect to slightly deflexed at the apex, 2–7 mm long, ovate to lanceolate, apex acuminate; corolla blue to violet, bilabiate, externally pubescent mainly at the superior portion, internally glabrous, tube erect, tubular, subgibbous closer to the apex on the inferior portion, 20–33.5 mm long, inferior lip trilobate, inflexed mainly at the apex, 7–18 mm long, middle lobe oblong, apex obtuse to suborbicular, lateral lobes oblong, apex obtuse to orbicular, superior lip entire, incurved, galeate, subgibbous on the superior portion, 10–22 mm long, oblong, margin entire to slightly revolute, apex emarginate; stamens 2, included, inserted near the apex of the tube, fertile theca 1, blackish, oblong, 2.5–4.5 mm long, parallel, filament blue to purple, 4–6 mm long, glabrous, apex obtuse, connective elongate, 17–22 mm long, upper branch linear, lower branch subulate to deltate, concave, 6–8.5 mm long, interior margins fused in an articulation except at the lower apex, apophysis projected towards the interior of the tube, ca. 0.5 mm long; style blue to purple, exerted at the apex, 25–40 mm long, sparsely tomentose or glabrescent, stigma lobes unequal, superior lobe curved to arched, narrowly sulcate, subulate, 2.2–5.2 mm long, inferior lobe curved, sulcate, obtuse, 3.6–6.2 mm long, ovary lobes ca. 1 mm long, nectary 4-lobed, discoid, asymmetric, disc base ca. 1 mm long; nutlet 2.5–4 × 1.7–2 mm, oblong-ellipsoid, glabrous, granulose.

Material examined: Itatiaia, no mato, 24.I.1875, fl. and fr., *A.F.M. Glaziou* 6650 (R).

Additional material: BRAZIL. MINAS GERAIS: Caldas, VIII.1882, fl., *A.F. Regnell* 315 (K, P, R, US). PARANÁ: Guarapuava, Rio Jordão, 30.X.1986, fl., *J.M. Silva & P. Ravenna* 245 (MBM). SANTA CATARINA: Curitiba, west of Curitiba toward Campos Novos, 5.XII.1956, fl., *L.B. Smith & R. Klein* 8283 (L, US). São Bento do Sul, Rio Natal, linha férrea, próximo à estação de trem, 26°21'34"S, 49°17'14"W, 9.VI.2018, fl., *P. Schwirkowski* 2763 (FURB).

The species belongs to *S.* sect. *Coeruleae* Epling. Native to Brazil, Paraguay, Uruguay and Argentina, this species is found Brazil mainly within mixed ombrophilous forests vegetations or cultivated in anthropic areas (O'Leary & Moroni 2016; Oliveira *et al.* 2021). The species was collected only once, being found by Glaziou growing in its natural habitat within the forests of Itatiaia. It can be distinguished from other species of *Salvia* due to the combination of the blue to violet corolla with long tubes (20–33.5 mm) and inflexed lower lip.

10. *Salvia itatiaensis* Dusén, Ark. Bot. 8(7): 12, 1908. Fig. 2a-b

Subshrub, terrestrial, erect, up to 3 m tall. Stem tetragonous, canaliculate, glabrous to tomentulose or villosulous mostly at apex and nodes, internode 0.8–8 cm long. Leaves decussate, petiole 1–4 cm long, pubescent or villous, canaliculate, blade 1.9–10.1 × 1–4.5 cm, ovate, subchartaceous, discolorous, abaxially lighter, glabrous or villosulous mostly on the veins, hirtellous mostly along the blade margin, green, often abaxially maculate or completely violaceous to rarely vinaceous, apex acute to acuminate, base obtuse to rounded or rarely subcordate, margin serrate. Inflorescence terminal, spiciform thyrse, divided into pseudowhorls spaced 0.6–2 cm apart, 3–6-flowered, peduncle violaceous to rarely vinaceous with green base, 3.5–20 cm long, puberulous or villous; bracts opposite at the base of the pseudowhorl, green or violaceous, blade 5–10 × 1.5–3 mm, ovate to lanceolate, tardily deciduous, apex acuminate or caudate; surfaces glabrous or abaxially hirsute to strigulose along the midrib, margin entire or ciliate. Pedicel (1–) 3–5 mm long, puberulous or villosulous; calyx violaceous or purple to pinkish with green base or completely violaceous or green, 9–11-nerved, bilabiate, 6.6–10 mm at anthesis, 8–11 mm in fruit, externally glabrescent to sparsely hirsute on veins, internally scabrous to strigulose, tube erect to slightly declinate, tubular to campanulate, 4.3–7.5 mm long, inferior lip 6-nerved, bilobate, erect or slightly inflexed at the apex, 2.3–4.5 mm long, lobes ovate, apex acuminate or cuspidate, superior lip 3–5-nerved, erect or slightly deflexed, 2–4 mm long, rotund, apex mucronate to cuspidate, inflexed when at anthesis, deflexed when in fruit; corolla magenta to violet, magenta to lilac or occasionally violet, with whitish maculae at the base of the

inferior lip projected to the tube or all over the lip towards the tube except for the margins, inferior portion of the tube or the whole tube whitish, bilabiate, externally pubescent to villous on the superior lip, internally glabrous, tube erect to shortly declinate, tubular to campanulate, gibbous closer to the apex on the inferior portion, 9–13 mm long, inferior lip deflexed, trilobate, invaginated at the base, deflexed, 4.5–8.5 mm long, middle lobe orbicular, apex emarginate, deflexed, lateral lobes orbicular, apex obtuse, erect to deflexed, superior lip entire, slightly incurved, galeate, subgibbous on the superior portion, 4–7 mm long, oblong, margin revolute, apex emarginate; stamens 2, included, inserted near the apex of the tube, fertile theca 1, yellow, oblong, ca. 2 mm long, lateral to the filament, parallel, filament whitish, 2.5–3.5 mm long, glabrous, apex obtuse, connective elongate, 5.5–6 mm long, upper branch linear, lower branch narrowly elliptical to oblong-lanceolate, concave, 2.5–3 mm long, interior margins fused in an articulation except at the lower apex, apophysis projected towards the interior of the tube, ca. 0.7 mm long; style pinkish to lilac, included in the galea, 10.5–17.5 mm long, villous at apex, stigma exerted at the apex, stigmatic lobes unequal, superior lobe arched, narrowly sulcate, subulate, 2.0–3.2 mm long, inferior lobe slightly curved, superficially sulcate, obtuse, 0.9–1.0 mm long, ovary lobes ca. 1 mm long, nectary 4-lobed, discoid, asymmetric, disc base ca. 1.2 mm long, anterior lobe ca. 2.5 mm long; nutlet brown to whitish brown with darkened lines, 2.6–2.9 × 1.8–1.6 mm, oblong-ovoid to ellipsoid, apex rounded, mucilaginous.

Material examined: MINAS GERAIS: Itamonte, 16.IX.1961, fl., *E. Pereira* 5776 (RB); Parque Nacional do Itatiaia, estrada entre Garganta do Registro e Brejo da Lapa, nas margens da estrada, 22°22'8.31"S, 44°44'53.67"W, 7.III.2018, fl. and fr., *A.B. Oliveira et al.* 22 (RB, RFA); 22°22'6.17"S, 44°44'28.56"W, 30.III.2019, fl. and fr., *A.B. Oliveira et al.* 41 (RFA). RIO DE JANEIRO: Itatiaia, Parque Nacional do Itatiaia, estrada para Agulhas Negras, km 10, 17.I.1979, fl., *P. Occhioni* 8684 (MBM, RFA); estrada para o Pico das Agulhas Negras, 22°15'–22°28'S, 44°34'–44°45'W, 15.II.1995, fl. and fr., *J.M.A Braga et al.* 2033 (RB); Macieiras, 15.III.1975, fl., *P. Occhioni* 7082 (RFA); Planalto, base do Pico das Prateleiras, 22°15'–22°28'S, 44°34'–44°45'W, 28.III.1995, fl. and fr., *J.M.A Braga et al.* 2255 (BHCB, MBML, RB); Serra do Itatiaia, Macieiras, 21.V.1902, fl., *P.K.H. Dusén* 305 (G, S). Resende, Mt. Itatiaia, west edge of planalto, at km 12 along road to shelter house, Abrigo Rebouças, 22°25'S,

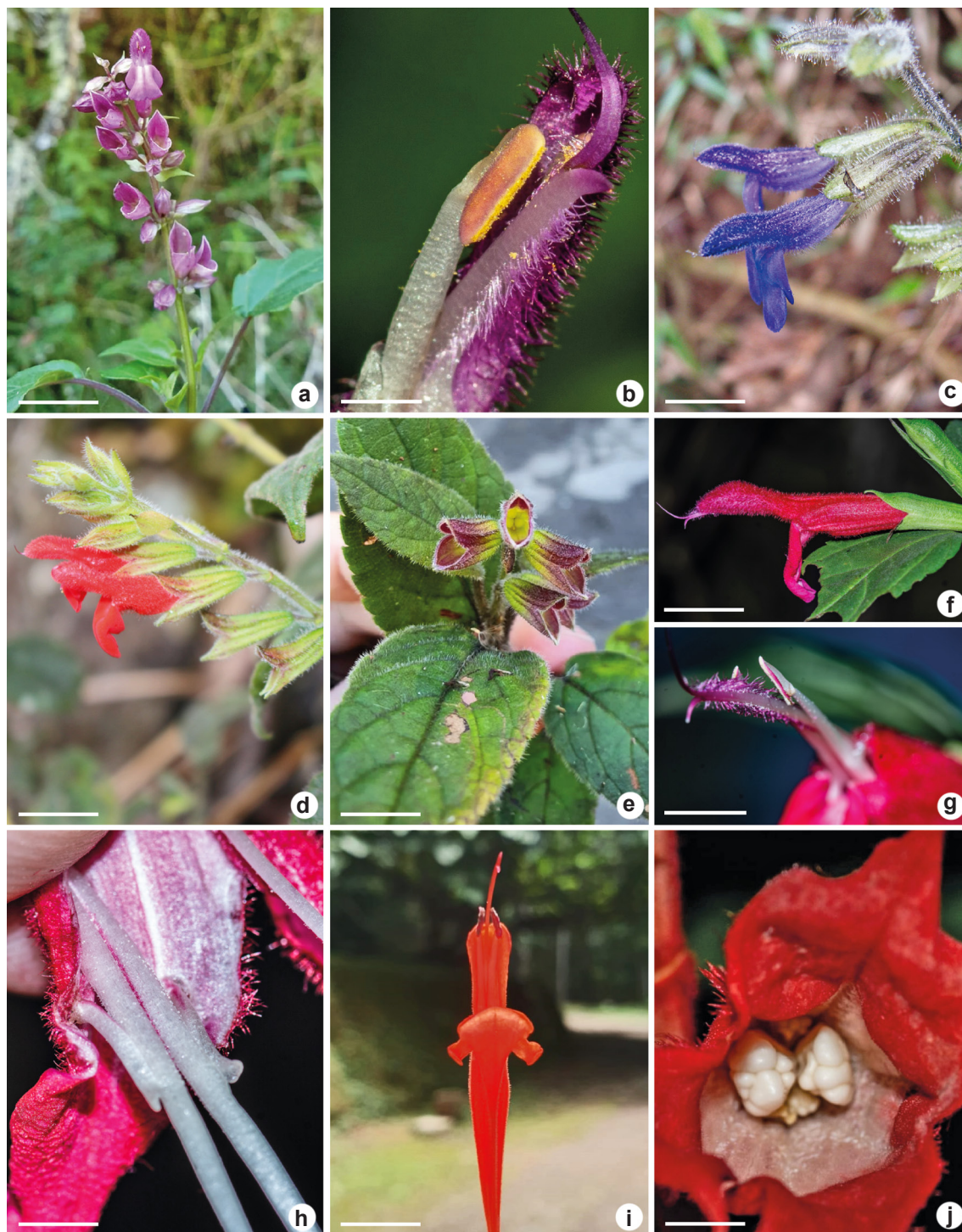


Figure 2 – a-j. Details of the reproductive structures of *Salvia* species – a-b. *Salvia itatiaiensis* – a. thyrses; b. stamen and stigma; c. *Salvia oligantha* – thyrses; d-e. *Salvia ombrophila* – d. thyrses; e. calyx in fruit; f-h. *Salvia sellowiana* – f. flower; g. thecae and stigma; h. filament and connective; i-j. *Salvia splendens* – i. flower; j. calyx in fruit. Scale bars: a, f = 16 mm; b = 1.5 mm; c, d = 12 mm; e = 14 mm; g, h = 5 mm; i = 7 mm; j = 3 mm. Photos: a, d-e. Marcelo Trovó; b, f-h. Hugo Dolsan; c. Izar Aximoff; i. Aron Barbosa; j. Suellen Nunes.

44°42'W, 6.XI.1965, fl., *G. Eiten & L.T. Eiten 6668* (NY, UB, USK); Parque Nacional do Itatiaia, estrada entre Brejo da Lapa e Posto Marcão, nas margens da estrada, 22°21'51.20"S, 44°43'18.95"W, 30.X.2017, fl. and fr., *A.B. Oliveira et al. 14* (RB); 22°21'54.96"S, 44°43'6.55"W, 30.III.2019, fl., *A.B. Oliveira et al. 40* (RB); Serra do Itatiaia, retiro ad marginem silvulae, 7.V.1902, fl., *P.K.H. Dusén 228* (S).

The species belongs to *S.* sect. *Angulatae* (Epling) Epling. Endemic to the high-altitude grasslands and ombrophilous forests within the Atlantic Forest in Minas Gerais and Rio de Janeiro states (Brade 1943; Oliveira *et al.* 2021). In the INP, it can be found between ca. 1,400–2,400 m alt., nearby the Macieiras Shelter, along trails to Três Picos, along roadsides to the high-altitude grasslands and rarely along trails to the Agulhas Negras and Prateleiras Peaks. Reproductive material from INP dates from every month of the year except August. It can be differentiated from other *Salvia* species in the region due to the combination of its mostly glabrescent structures and pinkish to lilac or violet corolla. It is highly similar to *Salvia arenaria* A.St.-Hil *ex* Benth., found in many protected areas of Rio de Janeiro state, but can be differentiated by its ovate leaves with obtuse to rounded base *vs.* elliptical leaves with acute to attenuate base in *S. arenaria* (Epling & Toledo 1943). *Salvia arenaria* var. *sellowii* Benth. is a synonym. Illustrations can be found in Brade (1943).

11. *Salvia mentiens* Pohl, Pl. Bras. Icon. Descr., 2: 137. 1831.

Subshrub or shrub, terrestrial, erect, up to 1.5 m tall. Stem tetragonus, canaliculate, completely glabrous or villous at apex, internode 6–8 cm long. Leaves decussate, petiole 2–7 cm long, glabrous or puberulous, canaliculate, blade 3.9–9 × 2.2–6.1 cm, ovate, membranous, green, discolorous, abaxially lighter, glabrous or sparsely puberulous mostly along the margin, apex acuminate, base rounded, obtuse or attenuate, margin crenate to serrate. Inflorescence terminal, spiciform thyrse, divided into pseudowhorls spaced 1.5–2.7 cm apart, 2–6-flowered, peduncle 10–30 cm long, glabrous to puberulous or villous; bracts opposite at the base of the pseudowhorl, green, blade 3–10 × 1.5–4 mm, ovate to lanceolate, deciduous, apex acuminate to caudate, abaxially sparsely puberulous with strigulose midrib, adaxially glabrous, margin shortly ciliate; bracteoles 1–4 × 0.5–2 mm, similar shape and indument to those

of the bracts. Pedicel 2–5.4 mm long, puberulous or villous; calyx green with apex frequently scarlet, 9–11-nerved, bilabiate, 8–9.5 mm long at anthesis, 12–15 mm long in fruit, externally sparsely hirtellous with trichomes concentrated on veins, internally glabrous or scabrous, tube erect, tubular when at anthesis, campanulate in fruit, 5–10 mm long, inferior lip 6-nerved, slightly inflexed, 3–5 mm long, lobes ovate to lanceolate, apex acuminate, superior lip 3–5-nerved, entire, erect to inflexed at the apex when at anthesis, recurved when in fruit, 2.8–4.7, rotund, apex acuminate to cuspidate; corolla red, bilabiate, externally puberulous, internally glabrous, tube shortly ascendent, tubular, subgibbous closer to the apex on the inferior portion, 22–30 mm long, inferior lip trilobate, 4–6.5 mm long, middle lobe orbicular, deflexed, apex emarginate, lateral lobes orbicular, deflexed, apex obtuse, superior lip entire, erect, galeate, subgibbous on the superior portion, 5–7 mm long, oblong, apex emarginate; stamens 2, included to exserted, inserted near the apex of the tube, fertile theca 1, oblong, ca. 2.8 mm long, lateral to the filament, parallel, filament 4–6.3 mm long, glabrous, apex obtuse, connective elongate, concave, 10–12 mm long, upper branch linear, lower branch linear-oblong to lanceolate, concave, ca. 6–7 mm long, interior margins fused in an articulation except at the lower apex, apophysis absent; style exserted, 23–35 mm long, glabrous or pilose, stigmatic lobes unequal, widely sulcate to flat, superior lobe linear, 1.7–2 mm long, inferior lobe obtuse, 1.6–1.7 mm long, ovary lobes 1.3 mm long, nectary 4-lobate, discoid, asymmetric, disc base ca. 1.0 mm long, anterior lobe ca. 2.0 mm long; nutlet brown with tiny, darkened maculae, ca. 3 × 2 mm, oblong-ovoid, sparsely foveolate or punctulate, apex obtuse to cuspidate, mucilage not seen.

Material examined: Itatiaia, Lago Azul, lote 17, 14.III.1942, fl. and fr., *A.C. Brade 17218* (RB); Maromba, 25.XII.1928, fl., *P. Campos Porto 1859* (RB,SP); Monte Serrat, 24.II.1936, fl. and fr., *A.C. Brade 15063* (RB, SP); Parque Nacional de Itatiaia, Lago Azul, 8.III.1947, fl., *P. Occhioni 885* (RFA); Picada Velha para o planalto, 27.II.1942, fl. and fr., *W.D. Barros 635* (RB); Parque Nacional do Itatiaia, 17.II.1960, fl., *O.M. Barth 1200* (US).

The species belongs to *S.* sect. *Curtiflorae* Epling. Endemic to the high-altitude grasslands and ombrophilous forests within the Atlantic Forest in Espírito Santo and Rio de Janeiro states (Oliveira *et al.* 2021), with most records from INP. In the

park area, it can be found between ca. 830–1,400 m alt., in the ombrophilous forest near Lago Azul and Maromba. Reproductive material from INP dates from February, March, October, and December. It has many similarities with *Salvia splendens*, but it can be differentiated by the comparatively shorter perianth and predominantly green inflorescence and calyx (Brade 1943). In INP, it has been sparsely collected in the last 50 years, with no specimens being collected in the last 20 years, raising questions about its conservation status in the area. Illustrations can be found in Brade (1943).

12. *Salvia oligantha* Dusén, Ark. Bot., 9(5): 16. 1909. Fig. 2c

Subshrub, terrestrial, erect, up to 2.5 m tall. Stem tetragonous, canaliculate, densely tomentose or hirsute, internode 1.4–8.2 cm long. Leaves decussate, petiole 0.3–2.8 long, tomentose or hirsute, canaliculate, blade 2.2–8.3 × 1.4–4 cm, ovate to lanceolate, membranous to subchartaceous, green, discolorous, abaxially lighter, hirsute with trichomes concentrated on veins, adaxially tomentose to hirsute, apex acute to acuminate, base rounded, subcordate or rarely truncate, margin crenate to serrate. Inflorescence terminal, spiciform thyrses, divided into pseudowhorls spaced 1–5 cm apart, 3–6-flowered, peduncle 9–29 cm long, tomentose, or villous; bracts opposite at the base of the pseudowhorl, 6–8 × 6–8 mm, orbicular, deciduous, apex mucronate, cuspidate or obtuse, abaxially tomentose, adaxially glabrous, margin ciliate; bracteoles not seen. Pedicel 2–7 mm long, tomentose or villous; calyx green with violaceous or rarely blackish apex, 11–13-nerved, bilabiate, 11–14 mm long at anthesis, 14–17.6 mm long in fruit, externally tomentose with hispid veins, often glandular, internally glabrescent to scabrous, tube erect, tubular to campanulate, 8.9–12.6 mm long, inferior lip 6-nerved, bilobate, slightly inflexed, 2.1–5 mm long, lobes ovate, apex acuminate, superior lip 5–7-nerved, entire, inflexed at the apex when at anthesis, deflexed at the apex when in fruit, 2–4.8 mm long, rotund, apex obtuse or apiculate; corolla blue to violet with whitish maculae at the base of the inferior lip projected into the tube, bilabiate, externally pubescent, internally glabrous, tube erect, tubular, subgibbous closer to the apex on the inferior portion, 18–20 mm long, inferior lip trilobate, 9–12 mm long, middle lobe orbicular to reniform, deflexed, apex strongly emarginate, lateral lobes orbicular, deflexed, apex obtuse, superior lip entire, erect, galeate, subgibbous on

the superior portion, 6–8.5 mm long, oblong, apex emarginate; stamens 2, included, inserted near the apex of the tube, fertile theca 1, oblong, ca. 3 mm long, lateral to the filament, filament whitish to bluish, 2.7–3.5 mm long, glabrous, apex obtuse, connective elongate, concave, 9–12 mm long, upper branch linear, lower branch oblong-linear to lanceolate, 6–7 mm long, interior margins fused in an articulation except at the lower apex, apophysis projected towards the interior of the tube, ca. 0.5 mm long; style whitish to blue, included in the galea, 20.4–24.7 mm long, tomentose, stigma exerted at the apex, stigmatic lobes unequal, superior lobe arched, sulcate, flagelliform, 3.8–5 mm long, inferior lobe slightly curved, superficially sulcate to flat at the apex, obtuse, 1.7–1.9 mm long, ovary lobes 1.3 mm long, nectary 4-lobed, discoid, asymmetric, disc base ca. 1.4 mm long, anterior lobe ca. 3 mm long; nutlet brown with tiny, darkened maculae, 2.8–3 × 1.6–2 mm, oblong-ellipsoid to ovoid, smooth, glabrous, apex obtuse, mucilage not seen.

Material examined: Itatiaia, estrada para o Planalto, km 10, 14.III.1975, fl., *P. Occhioni* 7028 (RFA); km 13, 29.V.1935, fl. and fr., *A.C. Brade* 14601 (RB); Parque Nacional de Itatiaia, estrada para a parte alta, Brejo da Lapa, 10.VI.2012, fl., *M.L.O. Trovó et al.* 568 (RB); km 13, 7.III.1947, fl., *P. Occhioni* 844 (RFA); Rio Campo Bello, 5.III.1942, fl. and fr., *A.C. Brade* 17204 (RB); Serra do Itatiaia, Macieira, 21.V.1902, fl., *P.K.H. Dusén* 234 (R, S). Resende, Serra do Itatiaia, 1953, fl., *F. Segadas-Vianna et al.* 1204 (RFA, US).

Additional material: BRAZIL. SÃO PAULO: Bananal, Parque Nacional da Bocaina, mata das margens do Rio Bonito, próximo ao marco 22, 5.IV.1980, fl., *G. Martinelli & L.A. Simões Lopes* 6709 (RB); Reserva Florestal da Bocaina, 5.V.1968, fl., *D. Sucre et al.* 2884 (RB); 5.V.1968, fl., *D. Sucre et al.* 2901 (RB); Serra da Bocaina, 30.IV.1951, fl. and fr., *A.C. Brade* 20794 (RB); V.1951, fl., *A.P. Duarte* 3431 (RB).

The species belongs to *S. sect. Dusenostachys* (Epling) Epling. Endemic to the high-altitude grasslands, gallery, riverine and ombrophilous forests within the Atlantic Forest in the Brazilian Southeast, except for Espírito Santo state (Oliveira *et al.* 2021). In INP, it is found between ca. 800–1,800 m alt., usually near the Macieiras Shelter in the ombrophilous forest or more rarely along roads leading to peaks like Agulhas Negras, close to the forest limits. Reproductive material from INP dates from October to July. It is markedly different from other *Salvia* species in the region due to its violet corolla and densely tomentose to hispid indument.

13. *Salvia ombrophila* Dusén, Ark. Bot., 8(7): 13. 1908. Fig 2d-e

Subshrub, terrestrial, erect, up to 2 m tall. Stem tetragonous, canaliculate, villous, internodes 1.8–6.0 cm long. Leaves decussate, petiole 0.6–3.7 cm long, villous, canaliculate, blade 1.9–9.5 × 1–5.1 cm, ovate, green with often vinaceous veins on the abaxial surface, discolorous, abaxially lighter, subchartaceous, surface densely villous, apex acute to acuminate, base subcordate or rounded, margin crenate to serrate. Inflorescence terminal, spiciform thyse, divided into pseudowhorls spaced 0.8–3 cm apart, 3-flowered, peduncle green, 2.5–10 cm long, villous; bracts opposite at the base of the pseudowhorl, green, blade 4–12 × 1.7–6.2 mm, ovate, apex acuminate or caudate, abaxially villous, adaxially glabrous, tardily deciduous, margin ciliate. Pedicel 2–4 mm long, pubescent; calyx green with vinaceous or dark red to often purplish apex, 9–11-nerved, bilabiate, 7–8 mm long at anthesis, 12–14 mm long in fruit, externally hirsute with trichomes concentrated on veins, internally strigulose, tube erect, tubular to campanulate, 5–9 mm long, inferior lip 6-nerved, bilobate, erect to slightly inflexed at apex, 2–5 mm long, lobes ovate to lanceolate, apex acuminate, superior lip 3–5-nerved, entire, inflexed at apex when at anthesis, deflexed when in fruit, similar dimensions, rotund, apex mucronate to acuminate; corolla bright red, bilabiate, externally pubescent, internally glabrous, tube erect, tubular, subgibbous closer to the apex on the inferior portion, 15–21 mm long, inferior lip trilobate, recurved, 7–7.5 mm long, middle lobe oblong to orbicular, deflexed, apex submarginate, lateral lobes orbicular, erect to deflexed, apex obtuse, superior lip entire, slightly incurved, galeate, subgibbous on the superior portion, 6.5–7.5 mm long, oblong, margin revolute, apex emarginate; stamens 2, included, inserted near the apex of the tube, filament whitish, 2.7–4.5 mm long, glabrous, apex obtuse, fertile theca 1, oblong, ca. 3.5 mm long, lateral to the filament, connective elongate, concave, 9–11 mm long, upper branch linear, lower branch oblong-linear to lanceolate 5–6.5 mm long, internal margins fused in an articulation except at the lower apex, apophysis projected towards the interior of the tube, ca. 0.7 mm long; style scarlet with whitish apex, included in the galea, 18.5–25.6 mm long, villous with higher density of trichomes on the inferior portion, stigma exerted at the apex, stigmatic lobes unequal, superior lobe arched, narrowly sulcate, subulate 2–3.2 mm long, inferior lobe

slightly curved, sulcate to flat at the apex, obtuse, 0.9–1.3 mm long, ovary lobes 1.3 mm long, nectary 4-lobed, asymmetric, discoid, disc base 1.5 mm long, anterior lobe ca. 3.0 mm long; nutlet amber or light brown with slightly darkened maculae, 2.5–3.2 × 1.7–2 cm, ovoid, smooth or punctulate, glabrous, apex obtuse to rounded, mucilaginous.

Material examined: Itatiaia, BR-354, 24.I.1987, fl., *R. Mello-Silva et al.* 8 (K, SPF); Parque Nacional de Itatiaia, estrada para o Pico das Agulhas Negras, 22°15'–22°28'S, 44°34'–44°45'W, 26.IV.1995, fl., *J.M.A. Braga et al.* 2338 (RB); estrada para o Planalto, km 10, 17.XI.1980, fl., *P. Occhioni* 9193 (RFA); garganta das Agulhas, 12.III.1947, fl., *P. Occhioni* 917 (RFA); Serra de Itatiaia, 27.V.1902, fl. and fr., *P.K.H. Dusén* 399 (R, S). Resende, Parque Nacional do Itatiaia, estrada entre Brejo da Lapa e Posto Marcão, nas margens da estrada, 22°21'52.74"S, 44°43'36.41"W, 30.X.2017, fl. and fr., *A.B. Oliveira et al.* 17 (RB); 22°21'46.58"S, 44°43'48.04"W, 29.XI.2018, fl. and fr., *A.B. Oliveira et al.* 24 (RB, RFA); 22°21'54.96"S, 44°43'6.55"W, 30.III.2019, fl. and fr., *A.B. Oliveira et al.* 39 (RB).

The species belongs to *S.* sect. *Tubiflorae* (Epling) Epling, previously treated as part of *Angulatae* (Epling) Epling (Epling 1939; Epling & Mathias 1957). Endemic to the ombrophilous forests within the Atlantic Forest in the Brazilian Southeast except for Espírito Santo state (Oliveira *et al.* 2021). In INP, it was found between ca. 2,000–2,400 m alt., near roadsides within the montane forest and can also be found along the trails to Agulhas Negras and Prateleiras Peaks. Reproductive material from INP dates from October to June. It is noticeably aromatic. Among the species of *Salvia* in the region, it can be differentiated by its relatively small perianth compared to other scarlet corolla species and the densely villous indument.

14. *Salvia sellowiana* Benth., Prodr. [AP de Candolle], 12: 329, 1848. Fig. 2f-h

Subshrub to shrub, terrestrial, erect, up to 4 m tall. Stem tetragonous, canaliculate, glabrous to sparsely puberulous at apex with often villosulous nodes, internode 1.8–8.4 cm long. Leaves decussate, petiole (0.6–)1–4 cm long, glabrous or sparsely puberulous, canaliculate, blade 4.7–12.6(–18.1) × 2–5.2(–6.2) cm, lanceolate to ovate or elliptical, subchartaceous, green or abaxially violet, discolorous, abaxially lighter, surfaces glabrous, apex acute to acuminate, base attenuate to acute or rounded-attenuate, rarely unequal, margin serrate. Inflorescence terminal, spiciform thyse, divided into pseudowhorls

spaced 1.1–4 cm apart, cymules 1–3-flowered, peduncle occasionally with vinaceous to dark purple maculae, 1.5–5(–9.6) cm long, glabrous or sparsely puberulous; bracts opposite at the base of the pseudowhorl, green or magenta with apex frequently green, blade 15–40 × 3.5–8.5 mm, ovate to lanceolate, tardily deciduous, apex acuminate, abaxially glabrous or puberulous along the blade margin, adaxially glabrous, margin entire or shortly ciliate; bracteoles opposite at the base of the cymule or pedicel, green or magenta with green apex, 11–17.3 × 2.0–3.0 mm, linear–lanceolate, deciduous, apex acuminate, abaxially puberulous, adaxially glabrous, margin shortly ciliate. Pedicel 3–8 mm long, glabrous to sparsely puberulous; calyx green or dark purple to vinaceous with green base, 14–15-nerved, bilabiate, 23–32 mm long at anthesis, 26–36 mm long in fruit, externally glabrous or sparsely hirsute along the margin, internally strigulose, tube erect, tubular, 13–18 mm long, inferior lip 7-nerved, entire or bilobate, slightly deflexed at apex, 8.5–18 mm long, lobes lanceolate, apex acuminate, superior lip 7-nerved, entire, slightly deflexed at apex, 10–19 mm long, lanceolate to ovate, apex acuminate; corolla magenta to reddish, bilabiate, externally pubescent to pilose with higher density of trichomes on the superior lip, internally glabrous, tube erect, tubular, gibbous closer to the apex on the inferior portion, 30–45 mm long, inferior lip trilobate, recurved, 10–17 mm long, middle lobe oblong, apex emarginate to obcordate, deflexed, lateral lobes oblong, apex obtuse, deflexed, superior lip entire, slightly incurved, galeate, subgibbous on the superior portion, 11–17 mm long, oblong, margin revolute, apex emarginate; stamens 2, included, inserted near the apex of the tube, fertile theca 1, oblong, light yellow, 5–7 mm long, lateral to the filament, divaricate to parallel, filament whitish or pinkish, 6.5–9.2 mm long, glabrous, connective elongate, concave 17–23 mm long, upper branch linear, lower branch linear, 10–13 mm long, internal margins fused in an articulation except at the lower apex, apophysis absent; style white to pinkish, exerted, 38–59 mm long, villous, stigmatic lobes unequal, curved, briefly sulcate to flat at the apex, superior lobe flagelliform, 5.5–7 mm long, inferior lobe subulate, 2.5–3 mm long, ovary lobes ca. 2 mm long, nectary 4-lobed, asymmetric, discoid, disc base ca. 1.5 mm long, anterior lobe ca. 3.5 mm long; nutlet brown, 3–4 × 2–2.7 mm, oblong-ellipsoid to ovoid, foveolate when mature, glabrous, apex obtuse to truncate, mucilage not seen.

Material examined: MINAS GERAIS: Itamonte, Parque Nacional do Itatiaia, estrada entre Garganta do Registro e Brejo da Lapa, nas margens da estrada, 22°22'24"S, 44°45'13.03"W, 7.III.2018, fl., *A.B. Oliveira et al.* 20 (RB); estrada para Agulhas Negras, 2.V.1985, fl., *G. Martinelli et al.* 10815 (RB). RIO DE JANEIRO: Itatiaia, III.1945, fl., *F. Segadas-Vianna* (RFA 22789); lote 60, 13.III.1942, fl., *A.C. Brade* 17319 (RB); Parque Nacional do Itatiaia, estacionamento da Cachoeira da Maromba, 22°25'43.96"S, 44°37'11.66"W, 30.X.2017, fl., *A.B. Oliveira et al.* 16 (RB); estrada para o Planalto, km 6, 17.XI.1980, fl., *P. Occhioni* 9212 (RFA); Planalto, 31.VIII.1964, fl., *E. Pereira* 9142 (RB); Maromba, 12.VII.1953, fl., *E. Pereira et al.* 45 (RB); Maromba para Macieiras, 30.V.1969, fl. and fr., *D. Sucre & T. Plowmann* 2880 5180 (RB).

Additional material: BRAZIL. fl., *Sellow* (GH 55370, US 121646, US 1234074). SÃO PAULO: Reserva Florestal da Bocaina, 7.V.1968, fl., *D. Sucre et al.* 3001 (RB).

The species belongs to *S.* sect. *Nobiles* (Benth.) Epling. Endemic to the gallery, riverine and ombrophilous forests within the Atlantic Forest in the Brazilian Southeast, except for Espírito Santo state (Oliveira *et al.* 2021). It is one of the most frequently found species within the region, appearing throughout the ombrophilous forests inside the park, between ca. 900–2,100 m alt., often being related to the proximities of water bodies such as the Maromba Waterfall. Reproductive material from INP dates from all months of the year. Similar to *S. articulata*, the species presents itself as robust individuals comparatively with other *Salvia* species while showing large, vividly colored flowers arranged in terminal thyrses with comparatively large, tardily deciduous bracts.

15. *Salvia splendens* Sellow *ex* Nees. Flora 4(19): 300 (1821). Fig. 2i-j

Subshrub or shrub, terrestrial, erect, up to 1.6 m tall. Stem tetragonous, canaliculate, internodes glabrous to villous mainly on the nodes, 1–5.6 cm long. Leaves decussate, petiole 1–6(–9.5) cm long, glabrescent to villous, canaliculate, blade 4–15.3 × 2–9.5 cm, ovate, membranous, green, discolorous, abaxially lighter, surfaces glabrous to puberulous mostly along the margin of the blade, apex acute to acuminate, base rounded or obtuse, margin serrate. Inflorescence terminal, spiciform thyrses, divided into pseudowhorls spaced 0.4–4 cm apart, 2–3(–6)-flowered, peduncle scarlet, 12–20(–32) cm long, glabrous to villous at apex; bracts opposite at the base of the pseudowhorl, scarlet, blade 6–20 × 3–10 mm, ovate, deciduous, apex acuminate to caudate, abaxially sparsely

pilose, adaxially glabrous, ciliate margin, sessile. Pedicel 0.34–1 cm long, pubescent or villous; calyx bright red, 9-nerved, bilabiate, 13.3–22 mm long at anthesis, 15–25 mm long in fruit, externally pubescent with hirsute veins, internally strigulose, tube erect, tubular when at anthesis, campanulate when in fruit, 9.5–15.4 mm long, inferior lip 6-nerved, bilobate, erect to slightly deflexed when at anthesis, strongly deflexed when in fruit, 3.5–9 mm long, lobes ovate, apex acuminate, superior lip 3-nerved, entire, erect or deflexed with apex frequently inflexed when at anthesis, recurved when in fruit, 3.8–9.6 mm long, rotund, apex acuminate; corolla bright red, bilabiate, externally pubescent, internally glabrous, tube erect or shortly ascendent, tubular, subgibbous closer to the apex on the inferior portion, 30–47 mm long, inferior lip trilobate, 5–8 mm long, middle lobe orbicular, inflexed, apex retuse to emarginate, lateral lobes orbicular deflexed, apex obtuse, superior lip entire, erect to slightly incurved, galeate, gibbous on the superior portion, 6–10 mm long, oblong, margin entire or revolute, apex emarginate; stamens 2, exerted, inserted near the apex of the tube, fertile theca 1, dark brown to vinaceous, oblong, ca. 3.5 mm, lateral to the filament, parallel, filament scarlet, 6.5–7.7 mm long, glabrous, connective elongate, concave, 16–19 mm long, upper branch linear, lower branch linear, 9–10 mm long, internal margins fused in an articulation except at the lower apex, apophysis absent; style scarlet to whitish, exerted, 35–57.5 mm long, glabrous, stigmatic lobes subequal, curved, widely sulcate to flat, superior lobe acute, 1.5–2 mm long, inferior lobe obtuse, 1.1–1.5 mm long, ovary lobes 1.8 mm long, nectary 4-lobed, discoid, asymmetric, disc base ca. 1.5 mm long, anterior lobe 3.7 mm long; nutlet brown to whitish brown, sometimes with tiny, darkened maculae, 3–4.5 × 2–2.7 mm, oblong, smooth to ruminate at apex, glabrous, apex obtuse, mucilaginous.

Material examined: Itatiaia, Parque Nacional de Itatiaia, estrada logo após a entrada do Parque, Sede do Parque, 22°27'44.04"S, 44°35'35.20"W, 30.III.2019, fl. and fr., *A.B. Oliveira et al.* 37 (RB); 12.X.2003, fl. and fr., *M.B.F. Canela et al.* 30 (RB); Picada Campos Porto, 23.X.1945, fl., *Altamiro & Walter* 51 (RB).

Additional material: BRAZIL. MINAS GERAIS: Carangola, zona rural, XII.1996, fl., *L.S. Leoni* 3012 (RB). PARANÁ: Curitiba, Juvevê, 29.X.1982, fl. and fr., *L.M.L.B. Macedo* 9 (HUCP). RIO DE JANEIRO: Duque de Caxias, Reserva da Petrobras, trilha ao redor da represa (barragem), "Plataforma", 22°31'S,

43°16'–43°14'W, 26.VIII.1997, fl., *J.A. Lira Neto et al.* 645 (NY, RB). Mauá, 5° distrito de Magé, 30.III.1986, fl., *L.C. Giodarno* 43 (RB). SÃO PAULO: São José dos Campos, terreno ao lado da EMBRAER, Av. Dr. Amin Simão, 23°13'36"S, 45°05'115"W, 7.II.2018, fl. and fr., *G.M. Antar* 2083 (CEN, RB, SPF); Tapiraí, reserva particular de Votorantim (CBA), trilha da Boatudo, 24°2'17.398"S, 47°22'48.043"W, 29.III.2013, fl. and fr., *J. Kuntz et al.* 976 (ESA, RB).

The species belongs to *S.* sect. *Secundae* (Benth.) Epling. Endemic to ombrophilous forests within the Atlantic Forest in the Brazilian Northeast (Bahia), Central-west (Goiás), Southeast, and South regions (Oliveira *et al.* 2021). Reproductive material from INP dates from March, October, and December. It is one of the most common species of Lamiaceae in the INP, found between ca. 600–1,100 m alt., being dispersed by anthropic or natural action. It can be easily recognized by its exerted stamen and strongly scarlet inflorescences, bracts, and flowers.

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