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Research article

A taxonomic revision of *Calea* subgenus *Meyeria* (Asteraceae, Neurolaeneae), endemic to the Southeast and South Brazilian open vegetation

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Abstract. *Calea* comprises 165 species distributed from Mexico to Argentina. Within the tribe Neurolaeneae, the genus is distinguished by its striated phyllaries, generally yellow corollas, anthers and style branches, as well as its pappus elements in the form of scales. *Calea* subg. *Meyeria* Baker is endemic to southeastern and southern Brazil, where it occurs in open vegetation such as grasslands, savannas, and rock outcrops. This subgenus includes eight species and one hybrid, and its monophyly has recently been supported by molecular data. The aim of this study is to provide a taxonomic revision of the subgenus. Protologues and herbarium specimens were studied and together with fieldwork, these efforts resulted in more than 1300 specimens analyzed in detail. Morphological descriptions of the subgenus and its subordinate taxa are provided, including the description of a new nothospecies *C.* × *malmeana* V.R.Bueno & G.Heiden nothosp. nov. The subgenus currently comprises eight species and two nothospecies, and is characterized by having a shrubby habit, ovate leaf blade, two series of foliaceous phyllaries, radiate capitula, and pappus of 8–15 scales. In addition, we provide data on distribution and habitat, informal conservation status, phenology, taxonomic notes, distribution maps, selected examined material, field images, and illustrations for the eight species and two nothospecies. This revision contributes to a better understanding of *Calea* and represents an important step forward by performing a detailed revision of an infrageneric group after classification based on a phylogenetic hypothesis.

Keywords. Atlantic Rainforest, Cerrado, Compositae, grasslands, savannas.

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Introduction

Calea L. is the most species-rich genus in the tribe Neurolaeneae Rydb. (Asteraceae Bercht. & J.Presl), comprising 165 species distributed from Mexico to central Argentina. The center of diversity is Brazil, which harbors 96 species, approximately 58% of the genus. Diagnostic features include a herbaceous to shrubby habit (rarely vines), opposite or sometimes whorled leaves, radiate capitula (often discoid), striated phyllaries, generally yellow corollas, anthers and style branches, and pappus elements in the form of scales (Bueno *et al.* 2021).

Morphologically, the genera most similar to *Calea* belong to the tribe Heliantheae Cass.: namely *Aldama* La Llave, *Dimerostemma* Cass., and *Wedelia* Jacq. Unlike *Calea*, these genera lack striate phyllaries (Flora e Funga do Brasil 2025). In addition, some species of *Wedelia*, all of *Aldama*, and most species of *Dimerostemma* have sterile ray florets, whereas *Calea* has pistillate ray florets. Although some species of *Dimerostemma* and *Wedelia* also have pistillate ray florets, they can be distinguished by the aristate or coroniform pappus, while *Calea* always has scales as pappus elements. Bueno *et al.* (2025a) provided an identification key for these genera.

Pruski (2023) proposed recognizing a "*Calea* alliance" with six genera based on morphological data. However, Bueno (2025e) provided the first phylogeny of the genus, based on nuclear data, sampling 37.5% of its species including those Pruski (2023) had designated as types of the proposed segregate genera. This phylogeny showed that the genus is monophyletic, making the alliance concept unnecessary.

Calea subg. *Meyeria* (DC.) Baker was established following the description and later synonymization of *Meyeria* DC. (Baker 1884). This subgenus represents an exclusively Brazilian clade mainly distinguished by its reduced pappus of scales (Bentham & Hooker 1873; Pruski 1998). However, phylogenetic reconstruction (Bueno *et al.* 2025e) showed that this subgenus as traditionally circumscribed (Bentham & Hooker 1873; Pruski 1998) is not monophyletic.

This subgenus was recircumscribed to comprise shrubs with a cymose capitulescence, capitula with four or more foliaceous outer phyllaries, and cypsela longer than the pappus (Bueno 2023). As a result of recircumscription, the number of species within this subgenus was reduced from 18 to 8 species (Barroso 1975; Robinson 1979; Pruski 1984, 2005, 2013; Pruski & Urbatsch 1987, 1988; Pruski & Hind 1998; Reis-Silva & Nakajima 2021; Bueno & Heiden 2021, 2022a, 2022b; Bueno *et al.* 2023a; Bueno 2023). This subgenus occurs in open vegetation in South and Southeastern Brazil.

Earlier, Urbatsch *et al.* (1986) conducted a systematic revision of infrageneric groups within *Calea*. More recently, three new species and one nothospecies were described (Bueno & Heiden 2021, 2022a, 2022b; Bueno *et al.* 2023a). These taxonomic efforts, based on a narrower circumscription, shed light on typifications and provided updated information on the application of type specimens for scientific names.

As much of the literature for *Calea* is still restricted to taxonomic revisions of its infrageneric taxa, this paper presents the first study to apply an integrative taxonomic framework that combines morphological and phylogenetic data (Bueno 2023). We here present an expanded description for the subgenus, an identification key, morphological descriptions of the species and nothospecies, distribution and habitat data, Informal conservation status assessments, phenology, maps, and field images.

Material and methods

The taxonomic revision was based on bibliography about *Calea* (Linnaeus 1763; Brown 1818; Candolle 1836; Gardner 1848; Bentham & Hooker 1873; Baker 1884; Robinson & Greenman 1896; Malme 1933; Barroso 1975; Robinson 1975, 1979; Pruski & Urbatsch 1983, 1987, 1988; Pruski 1984, 1997, 1998, 2005, 2011, 2013; Wussow *et al.* 1985; Urbatsch *et al.* 1986; Pruski & Hind 1998; Panero 2007;

Roque & Carvalho 2011; Diaz-Piedrahita & Rodríguez-Cabeza 2012; Pozo & Hind 2013; Silva 2016; Silva *et al.* 2016; Pruski & Robinson 2018; Silva & Teles 2018; Reis-Silva 2019; Reis-Silva & Nakajima 2020, 2021; Bueno & Heiden 2021, 2022a, 2022b; Bueno *et al.* 2021, 2022, 2023a, 2023b, 2023c, 2024a, 2024b, 2025b, 2025c, 2025d, 2025e, 2025f, 2025g; Bueno 2023; Remor *et al.* 2024; Melquíades *et al.* 2025; Silva *et al.* 2025).

In addition, a total of 1343 specimens from species of *C.* subg. *Meyeria* deposited in 72 herbaria were consulted, 51 of these were visited personally or were requested loans: ALCB, BHCB, BHZB, BLA, BM, BRIT, CEN, CESJ, DIAM, ECT, EFC, ESA, ESAL, FLOR, FUEL, FURB, G, HAS, HBR, HDJF, HEPH, HRB, HUCS, HUEFS, HUFSJ, HUFU, HURB, IBGE, ICN, K, MBM, MO, NYBG, P, PACA, PAMG, PEL, R, RB, RFA, SJRP, SMDB, SP, SPF, SPSF, UB, UEC, UFG, UPCB, US, VIC (acronyms according to Thiers 2025). Another 21 herbaria had specimens studied based on high-definition images hosted online through the following digitized herbaria: B, CRI, CTBS, F, FCAB, FPS (Fototeca Paulo Schwirkowski), GH, HUCP, HUPG, HURB, HVASF, IPA, JOI, L, LY, MBML, MG, S, U, UNIP, UNOP. Furthermore, online databases were consulted by means of the following platforms: C.V. Starr Herbarium Virtual (2025), Jstor Global Plants (2025), Reflora (2025), Smithsonian Virtual Herbarium (2025), SpeciesLink (2025), and Tropicos (2025).

For the morphological descriptions, 400 specimens were examined to represent the full range of geographical distribution and morphological variation. These specimens were first considered as morphotypes and/or grouped based on geographical origin. Descriptions and measurements were made from 115 individuals selected to represent geographic or morphotype units and to test whether they would represent discrete species or assemblages of cryptic taxa. At least seven vouchers were described for each species. For each voucher chosen from all taxa, all qualitative and quantitative characters were described. For standardization, two measurements, the smallest and the largest, of each specimen were made in this analysis of quantitative characters. This approach was also applied to the *Calea triantha* complex, which includes four species (Bueno & Heiden 2021, 2022a).

Vegetative structures were analyzed from dried herbarium specimens and the reproductive structures were described after rehydration in warm water at 80 ºC for one minute. We used a caliper rule, protractor, and stereo microscope to perform measurements and to assess additional characters. Measurement outliers were based on calculation of medians, quartiles, and interquartile deviations. "Rarely" applies to characters that occur in up to 10% of the specimens studied, "sometimes" is utilized for characters that occur between >10% and 25% of the specimens studied, "often" is used for characters that occur between >25% and 40% of the specimens analyzed. "Commonly", "generally" and "usually" are adopted for characters that most occur in the studied specimens.

Considering the taxonomic utility of the number of teeth on leaf margins for *Calea* subg. *Meyeria*, this trait was interpreted as discrete classes. Therefore, serrate margins were described as pauciserrate when both sides of the margins have up to five teeth; oligoserrate when both sides of the margins have between 6 and 10 teeth; and multiserrate is used when more than 11 teeth are present on both sides of the margin. The shape of the involucre was also interpreted as discrete classes; the terms are used in *Calea*'s literature and were taken from Beentje (2016): cylindrical = length/width ratio greater than or equal to 1.0; campanulate = length/width ratio between 1.01 and 1.30; hemispherical = length/width ratio greater than 1.3.

Another taxonomically-informative character in *Calea* includes the proportional length of the inner and outer series of phyllaries. Some species of *Calea* have outer series of phyllaries that are larger and extend beyond the apex of inner series of phyllaries (Pruski 2011). To standardize this character, we specifically use the terms longer/equal/shorter for relative measurements of the outer series of phyllaries compared to

the apex of the inner phyllaries, not to the entire involucre. In the table, we indicate the median instead of the mean, because it is less sensitive to extreme values. The general morphological terminology follows Hickey (1973), Ellis *et al.* (2009), and Beentje (2016). The Compositae terminology follows Funk *et al.* (2009), the striated phyllaries morphology follows Bueno *et al.* (2025g), the specific terminology about the receptacle and the pappus follows Bueno *et al.* (2022) and Bueno & Heiden (2022a), respectively.

All nomenclature information for *C.* subg. *Meyeria* (e.g., protologues and basionyms) are detailed in Bueno *et al.* (2025b), type information is provided here and synonyms are listed. Data on habitat, geographical distribution, and phenology were inferred from information available on specimen labels and fieldwork notes. Occurrence maps were prepared using Quantum GIS ver. 3.0 (QGIS 2015). The Extent of Occurrence (EOO) and AOO (Area of Occupancy) were generated using the GeoCAT (Bachman *et al.* 2011). Preliminary conservation status assessments followed guidelines and criteria from IUCN (2024).

Results

Class Magnoliopsida Brongn.
Order Asterales Link
Family Asteraceae Bercht. & J.Presl
Tribe Neurolaeneae Rydb.
Genus *Calea* L.

Calea* subg. *Meyeria (DC.) Baker
Fig. 1

Calea subg. *Meyeria* (DC.) Baker (Baker 1884: 252). – **Type species**: *Calea myrtifolia* (DC.) Baker (Baker 1884: 260).

Description

Shrubs 0.3–3 m tall. Leaves opposite, decussate, petiolate, petiole 0.17–3(–5.3) mm long; blades 0.4–4(–6.05) × 0.18–2.7(–3.08) cm, usually ovate, rarely elliptic or oblong, margins serrate or entire. Capitulescence commonly cymose dichasiform, sometimes capitulum solitary, pedunculate, peduncles 0.3–3.6 cm long. Capitulum heterogamous, radiate; involucre 5–13.6(–14.7) × 5.1–17.3(–20) mm, campanulate. Phyllaries 5-seriate, outermost series of phyllaries generally foliaceous, rarely just middle foliaceous, third series foliaceous or apex foliaceous or scarious, innermost series scarious; receptacle holopaleaceous, paleae 5.5–10.2 mm long. Ray florets 6–20 per capitulum, corolla 7.7–21.1(–22.3) mm long, liguliform, yellow, tube 1.5–4.4(–4.9) mm long, limb 5.3–17.7(–18.5) × 1.8–6.3(–7) mm; style branches 0.6–1.8 mm long. Disc florets 18–80 per capitulum, corolla 4.1–7.9 mm long, tubular, yellow, tube 1–2.9 mm long, lobes 0.7–2.1 mm long; anthers 2.1–3.4 mm long; style branches 0.9–1.6 mm long. Cypselae 2.3–3.6 mm long, obconical or prismatic, blackish; pappus of scales generally monotypic, often bitypic, usually monolength, often bilength, rarely polylength, free, 9–15 × 0.4–2.5(–4.5) mm, oblong or oblanceolate, sometimes elliptic.

Distribution and habitat

Calea subg. *Meyeria* is endemic to central-eastern and southern Brazil where it occurs in the states of central and southern Minas Gerais, eastern São Paulo, Paraná, Santa Catarina and northeastern Rio Grande do Sul (Fig. 1) in open areas from grasslands, shrublands, savannas, and rock outcrops of the Atlantic Forest and Cerrado domains. The total extent of occurrence of the subgenus is about 600 000 km², with an area of occupancy of 284 131 km², when excluding the forest formations and water bodies within this extent.

The present taxonomic study recognizes eight species and two nothospecies. The qualitative and quantitative morphological characterizations were the basis for the species descriptions, taxonomic notes, a key, and the overlapping key characters table (Table 1). The comparison of the leaves of the all taxa are in Fig. 2.

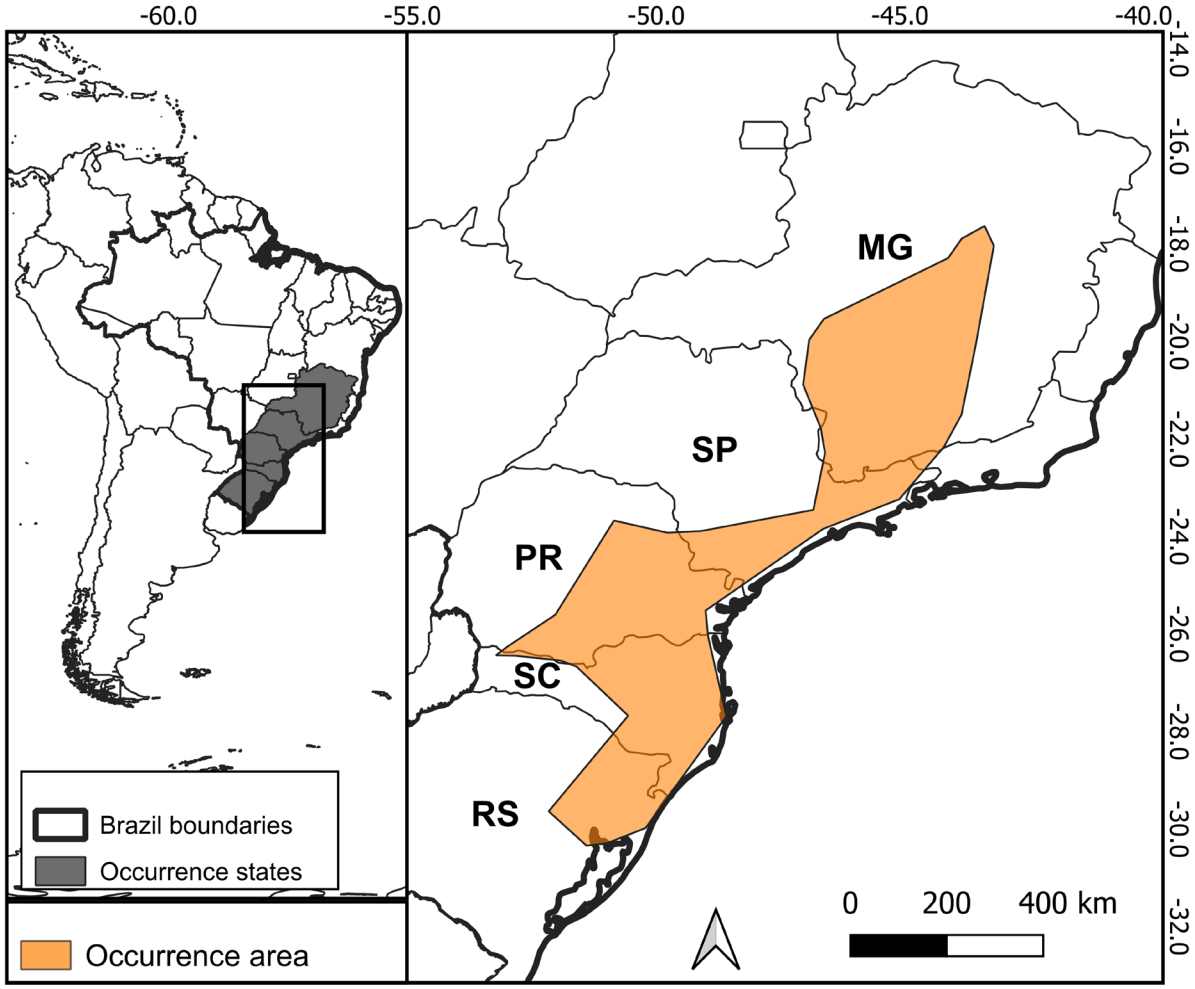

Fig. 1. Occurrence map of *Calea* subg. *Meyeria* Baker. Occurrence in Brazilian states: MG = Minas Gerais; PR = Paraná; RS = Rio Grande do Sul; SC = Santa Catarina; SP = São Paulo.

Table 1 (continued on next page). Morphological characters comparison of species and nothospecies of *Calea* subgen. *Meyeria* Baker (Asteraceae, Neurolaeneae). Medians of the measures are in square brackets.

	C. funkiana	***C. marginata***	***C. myrtifolia***	***C. parvifolia***	***C. phyllolepis***	***C. pruskiana***	***C. subintegerrima***	***C. triantha***	***C. × malmeana***	***C. × parviantha***
Leaf blade length (cm)	0.93–3.44 [2.02]	0.93–5.2(–5.95) [2.72]	0.79–6.03 [1.65]	0.68–2.5(–2.91) [1.25]	1.4–4.95 [2.72]	1.15–2.43(–3.12) [1.83]	0.67–1.73 [1.06]	0.7–2.93(–3.44) [1.4]	1.3–2.8 [2.15]	0.78–2.57 [1.37]
Leaf margin	Entire or pauciserrate, rarely serrate	Entire	Entire, often pauciserrate, sometimes serrate	Entire	Serrate or pauciserrate, rarely entire or multiserrate	Serrate, sometimes multiserrate, rarely pauciserrate	Pauciserrate, sometimes entire or serrate	Serrate, sometimes pauciserrate or multiserrate, rarely entire	Entire	Pauciserrate, often entire, sometimes serrate, rarely multiserrate
Teeth number	0–6(–11)	0 [0]	0–9(–13) [1]	0 [0]	0–11(–14)	(3–)5–13	0–10	(0–)1–12(–15) [6.5]	0 [0]	0–12(–14)
Capitulescence	Cymose dichasial	Capitula solitary or cymose dichasial	Cymose dichasial	Cymose dichasial, rarely capitula solitary	Cymose dichasial	Cymose dichasial	Cymose dichasial	Cymose dichasial	Capitula solitary, rarely cymose dichasial	Cymose dichasial, sometimes capitula solitary
Secondary stems of cymose capitulescence	2–8	2–4(–5)	2–14(–19)	2–18(–28)	2–12(–18)	2–10(–16)	2–9	4–26(–32)	2–4	2–14(–18)
First series of phyllaries in relation to involucre length	Longer, sometimes shorter	Longer, sometimes shorter	Shorter, rarely longer	Longer, often shorter, sometimes equal	Longer, often shorter, rarely equal	Shorter or equal	Shorter, rarely longer or equal	Shorter, rarely longer	Longer, often shorter	Longer, often shorter
First series of phyllaries length (mm)	7.6–15 [10.7]	(7.1–)7.6–15.4(–18.8) [11.8]	4.9–7.2(–11.3) [6.7]	(7.6–)8.7–9.9(–11.1) [9.2]	6.5–12.6(–14.4) [8.55]	7.5–9.9 [8.5]	4.5–7.7(–9.4)	(5.5–)6–8	10.5–12.3 [11.2]	6.6–10.2 [7.8]
Paleae length (mm)	9–10.5 [9.65]	6.7–9.2 [8.3]	5.6–10	5,6–10 [7.35]	6.5–9.7 [8.6]	8.7–9.3 [8.85]	5.5–8.4(–9.2) [7.5]	5.9–8.9 [7.45]	7.8–9.1 [7.95]	7–9 [7.7]
Ray floret tube length (mm)	2.5–3.4 [2.55]	2.7–4.4(–4.9) [3.6]	2.1–3.1 [2.7]	3–4.3 [3.5]	1.8–3.8 [2.6]	2.4–3.2 [2.6]	1.6–2.3(–3.5) [2.1]	1.7–2.8 [2.3]	3.1–4.3 [3.8]	1.5–3.8 [2.4]
Ray floret limb length (mm)	10.5–12.6 [10.15]	8.8–17.7 [12.7]	7.7–14.5 [8.75]	9.3–13.5 [11.3]	10.1–14.4 [11.7]	11.5–14.3 [12.9]	7.8–11.5 [9.3]	6–13.2 [8.9]	11.8–18.5 [14.65]	5.9–12.6

Table 1 (continued). Morphological characters comparison of species and nothospecies of *Calea* subgen. *Meyeria* Baker (Asteraceae, Neurolaeneae). Medians of the measures are in square brackets.

	C. funkiana	***C. marginata***	***C. myrtifolia***	***C. parvifolia***	***C. phyllolepis***	***C. pruskiana***	***C. subintegerrima***	***C. triantha***	***C. × malmeana***	***C. × parviantha***
Pappus scales type	Monotypic	Monotypic or bitypic	Monotypic	Monotypic, often bitypic	Monotypic	Bitypic, sometimes monotypic	Monotypic, often bitypic	Monotypic	Bitypic	Monotypic, often bitypic
Pappus scales length	Monolength	Monolength, often bilength	Monolength	Monolength or bilength	Monolength or bilength	Monolength, often bilength	Monolength, often bilength	Monolength	Monolength or bilength	Monolength, often bilength
Pappus scales lenght (mm), excluding longest scales	1.1–1.6 [1.35]	0.4–1.2 [0.7]	0.6–1.1 [0.9]	1.1–2.3 [1.3]	0.7–1.6 [1]	0.7–1.5 [1]	0.6–2.2 [1.4]	0.7–1.4(–2) [1.1]	0.6–1.6 [1.4]	1.1–2.2 [1.7]

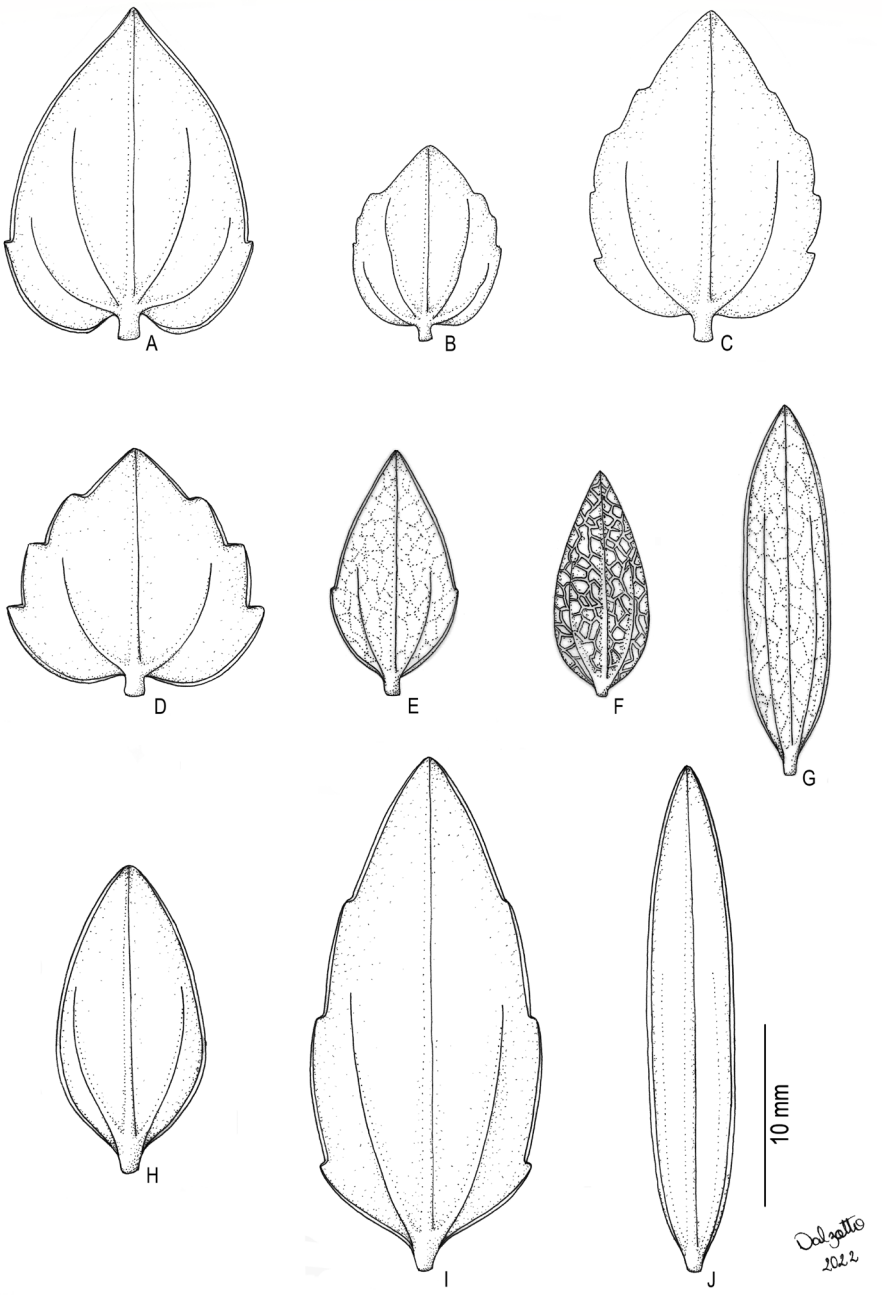

Fig. 2. Illustration of leaves of taxa of *Calea* subg. *Meyeria* Baker. **A**. *Calea funkiana* V.R.Bueno & G.Heiden (drawn from *S.J. Mayo et al. CFSC7026*; SPF). **B**. *Calea subintegerrima* (Malme) V.R.Bueno & G.Heiden (drawn from *A.L. Gasper & L.A. Funez 3538*; FURB). **C**. *Calea pruskiana* V.R.Bueno & G.Heiden (drawn from *M.J. Robim & J.P.M. Carvalho 530*; UEC). **D**. *Calea triantha* (Vell.) Pruski (drawn from *G. Heiden et al. 2312*; ECT). **E**. *Calea* × *parviantha* V.R.Bueno & G.Heiden (drawn from *A.C. Cervi 3546*; MBM). **F**. *Calea parvifolia* (DC.) Baker (drawn from *M.L. Brotto et al. 3175*; MBM). **G**. *Calea* × *malmeana* V.R.Bueno & G.Heiden nothosp. nov. (drawn from *E. Barbosa et al. 1293*). **H**. *Calea myrtifolia* (DC.) Baker (drawn from *V.R.Bueno 108*; ICN). **I**. *Calea phyllolepis* Baker (drawn from *V.R. Bueno 114*; ICN). **J**. *Calea marginata* S.F.Blake (drawn from *A.L. Christ 665*; ICN). Illustration by Débora Dalzotto.

Key to the taxa of *Calea* subg. *Meyeria* Baker

1. Leaf margins white, secondary veins inconspicuous; outermost series of phyllaries with white margins 2
– Leaf margins green, secondary veins conspicuous; outermost series of phyllaries with olivaceous margins 3

2. Stems non-glandular; 4th order of phyllaries glabrous, 5th order 2.3–2.7 mm wide ..... ***C. marginata*** S.F.Blake
– Stems glandular-punctate; 4th order of phyllaries sparsely glandular-punctate, 5th order 3.5–4.8 mm wide ..... ***C.* × *malmeana*** V.R.Bueno & G.Heiden nothosp. nov.

3. Stems corrugate, densely glandular-punctate, puberulous to puberulent; leaves chartaceous, margins flat ..... ***C. parvifolia*** (DC.) Baker
– Stems striate, non-glandular or glandular-punctate with stems hispid to hispidulous; leaves coriaceous, margins revolute 4

4. Stems villose; leaf blade abaxial surface villose; outermost series of phyllaries villose ..... ***C. funkiana*** V.R.Bueno & G.Heiden
– Stems hirsute, puberullent, puberulous, hispid, hispidulous or glabrous; leaf blade abaxial surface scabridulous, hispid, hispidulous, strigose, puberulous or glabrous; outermost series of phyllaries scabridulous, hispid, hispidulous, puberulous, strigose or glabrous 5

5. Peduncle pilose or hirsute or puberulous, leaf base rounded, fifth series of phyllaries 8.4–11.2 mm long 6
– Peduncle hispid or hispidulous or strigose or puberulous, leaf base cordate, fifth series of phyllaries 6.6–8.2 mm long 7

6. First series of phyllaries shorter than or equal to 6 mm, second series shorter than or equal to 6 mm, widely ovate to narrowly ovate, sometimes elliptic (2:1 ratio) ..... ***C. myrtifolia*** (DC.) Baker
– First series of phyllaries longer than 6 mm, second series longer than 6 mm, orbiculate (1:1 ratio) to widely elliptic (1.5:1 ratio) ..... ***C. phyllolepis*** Baker

7. First series of phyllaries apex acute, leaf venation acrodromous basal; corolla of ray florets 14.7–17 mm long ..... ***C. pruskiana*** V.R.Bueno & G.Heiden
– First series of phyllaries apex obtuse or acute, leaf venation reticulate or acrodromous suprabasal; corolla of ray florets 7.4–14.2 mm long 8

8. Peduncle strigose to sparsely hispidulous; outer series of phyllaries glabrous, sparsely strigose to glabrous, apex obtuse or rounded ..... ***C. subintegerrima*** V.R.Bueno & G.Heiden
– Peduncle hispid or hispidulous or puberulous; outer series of phyllaries hispid to hispidulous to glabrescent, scabrid or glabrous with apex acute 9

9. Leaf base cordate; paleae conduplicate ..... ***C. triantha*** (Vell.) Pruski
– Leaf base rounded or subcordate; paleae concave ..... ***C.* × *parviantha*** V.R.Bueno & G.Heiden

Calea funkiana V.R.Bueno & G.Heiden
Figs 2A, 3A, C, E, 4

Calea funkiana V.R.Bueno & G.Heiden (Bueno & Heiden 2021: 470).

Type material

BRAZIL – **Minas Gerais** • Santana do Riacho, Serra do Cipó; 28 Feb. 1991; fl., fr.; *S. Mayo*, *M.C.E. Amaral*, *I. Cordeiro* & *J.R. Pirani CFSC7026*; V.R. Bueno det. 2023; holotype: SPF [18618]; isotypes: MG [144560], UEC [27681].

Selected material examined

BRAZIL – **Minas Gerais** • Jaboticatubas, Estrada da usina; 28 May 1972; fl., fr.; *A.B. Joly et al. CFSC2241*; V.R. Bueno det. 2023; SP [150865], UEC [2531] • Santana do Riacho, arredores de Santana do Riacho; 25 Oct. 1974; fl., fr.; *G. Hatschbach et al. 35338*; V.R. Bueno det. 2023; MBM [32178] • 450 m da MG-010 na estrada para a "Pousada ao pé da Serra"; 9 Dec. 2020; fl., fr.; *I.A.C. Arruda 1158*; V.R. Bueno det. 2023; HUFU [81507] • APA Morro da Pedreira, rodovia Belo Horizonte, Conceição do Mato Dentro, Mãe d'água, ramal levando ao condomínio, ca 1 km da porteira da entrada; 18 Feb. 1972; *J.R. Pirani et al. 6283*; V.R. Bueno det. 2023; ALCB [162692], SPF [222040].

Description

Shrubs 0.7–3 m tall, slightly branched. Stems cylindrical, striate, commonly villous, sometimes sparsely villous, non-glandular, castaneous, internodes 4.9–23.6 mm long. Leaves decussate, petiolate, petiole 1.6–2.2 mm long, blades 0.93–3.44 × 0.78–2.76 cm, usually broadly ovate, sometimes ovate, rarely very broadly ovate, coriaceous, strongly discolorous, abaxial white, adaxial green, base cordate, apex acute, rarely attenuate or acuminate, venation acrodromous basal, secondary veins conspicuous; margins revolute, thin, green, usually pauciserrate or entire, rarely oligoserrate, 1–6(–11) teeth, 0.4–2.5(–3.5) mm long, from the base to the middle, sometimes just in the middle or in the base; abaxial surface villous, glandular-punctate, veins villous, adaxial surface scabridulous or with sparse long trichomes, non-glandular. Capitulescence cymose dichasiform, axis 0–5.6 cm long, branching to 2–5 ramification orders, 2–8 secondary stems; peduncle 0.34–2.49(–4.8) cm long, usually densely villous, often villous, non-glandular. Capitulum heterogamous, radiate; involucre 6–13.3 × 7.5–16.1 mm, generally campanulate, often hemispherical, sometimes cylindrical. Phyllaries 5-seriate; outermost series villous, margins foliaceous, green, inconspicuously striate, first series of phyllaries 7.6–15 × 4.6–8.4 mm, usually longer than involucre, sometimes shorter, commonly longer than second series, sometimes equal, usually elliptic to broadly elliptic, often ovate to broadly ovate, apex acute, glandular-punctate, margins entire, commonly middle revolute, sometimes revolute, 3-striate; second series 7.5–12.1 × 4.8–7.2 mm, broadly elliptic, ovate or deltoid, apex commonly acute, sometimes attenuate, glandular-punctate, margins entire, middle revolute, 3–4-striate; third series 9–10.9 × 5.25–7 mm, broadly usually oblong or oblong, sometimes broadly ovate, apex acuminate, generally villous, sometimes sparsely villous, non-glandular, margins entire, apex revolute, foliaceous, green, 4–6-striate; innermost series with apex obtuse, glabrous, margins entire, scarious, yellowish green or light yellow, conspicuously striate; fourth series blade 8.5–13 × 4–5.8 mm, oblong or narrowly ovate, margins middle erose, 12–15-striate; fifth series 8.2–13 × 2.5–4.5 mm, usually lanceolate or narrowly oblong, rarely narrowly elliptic, apex commonly acute, sometimes rounded, margins apex rarely erose, 10–12-striate. Receptacle convex, holopaleaceous, paleae 9–10.5 × 1.1–2 mm, usually longer than corolla disc, rarely equal, usually narrowly oblanceolate, often narrowly elliptic, apex long acuminate, concave, light yellow. Ray florets 10–15, pistillate, with corolla liguliform, yellow, 13–16 mm, tube 2.5–3.4 mm long, limb 10.5–12.6 × 3–3.8 mm, generally oblanceolate, rarely narrowly elliptic, apex 3-lobulate, with 5–6 veined, glabrous; style branches ca 1 mm long, linear, yellow. Disc florets 25–45, monoclinous, corolla tubular, yellow, 5.25–7 mm long, tube 1.6–2 mm long, lobes 1–1.2 mm long, glabrous, yellow. Anthers 2.5–2.8 mm long, light yellow, anther appendages apically ovate; style branches 1.5–1.6 mm long, linear, yellow. Cypselae 2.75–3 mm long, prismatic or obconic, nigrescent, ribs light yellow or nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, faces glabrous, ribs densely pilose; pappus monotypic, monolength, free, scales 10–13, 1.1–1.6 mm long, commonly oblanceolate, sometimes elliptic or oblong, apex obtuse, margins entire, apex erose.

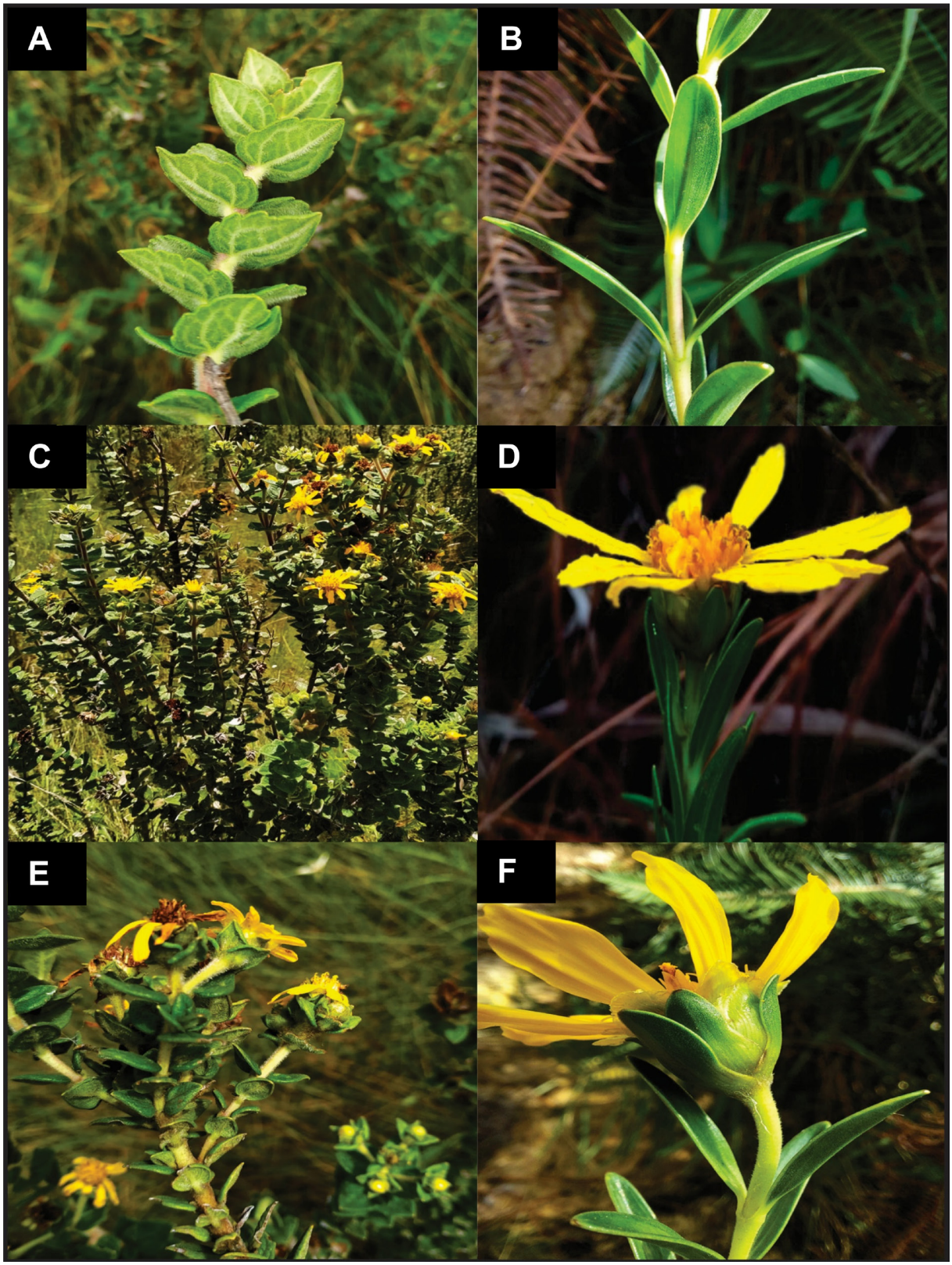

Fig. 3. *Calea funkiana* V.R.Bueno & G.Heiden (A, C, E) and *Calea marginata* S.F.Blake (B, D, F). Photos: A, C, E by I.A.C. Arruda; B, F by R.T. Dall'Agnol; D by M. Engels.

Distribution, habitat and phenology

Calea funkiana is endemic to Cerrado from Parque Nacional da Serra do Cipó and Área de Proteção Ambiental Morro da Pedreira in Minas Gerais State (Fig. 4). It grows in cerrado rupestre sites (Pereira & Fernandes 2022), living in moist sites of rock outcrops and sandy soils at elevations of 1000–1400 m. Fertile specimens (with flower and fruit) were collected from October to March, although there are some collections in May and July.

Informal conservation status

Endangered (EN) B1ab(v)+2ab(v); D. Since the first records of this species (Bueno & Heiden 2022b), two new localities for this species were added, therefore the Extent of Occurrence (EOO) and Area of Occupancy (AOO) increased from 20 km² to 159.026 km² and from 48 km² to 56 km², respectively, but even so the degree of threat remains the same. The locations found are in humid formations of the Serra do Cipó mountain range, which, given the area's history, are known to be severely fragmented environments (B condition a). Furthermore, collections were more abundant in the past than they are currently, suggesting a decline in populations (B condition b). In recent collections, over the last twenty years, collectors estimate having seen fewer than 250 mature individuals (I.A.C. Arruda, pers. com.). The

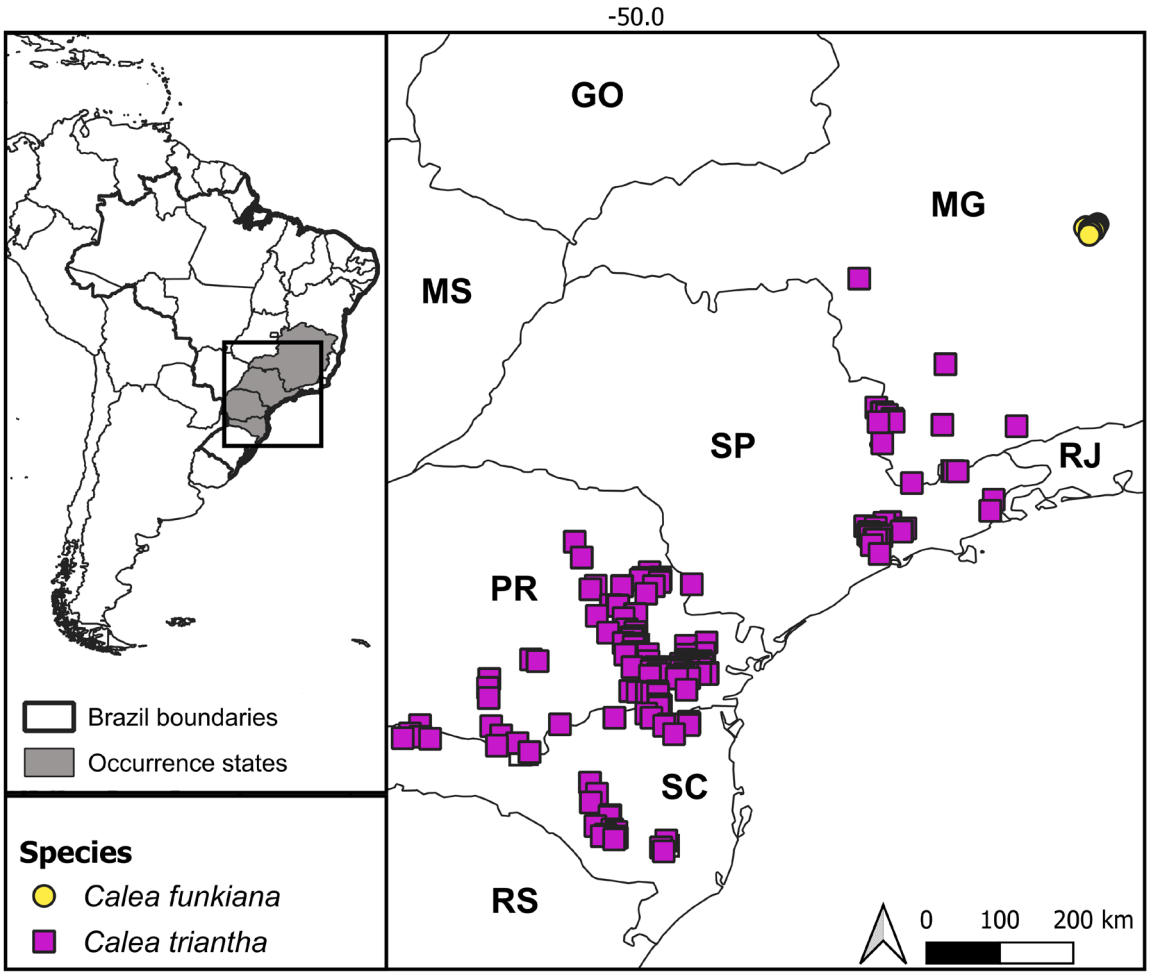

Fig. 4. Occurrence map of *Calea funkiana* V.R.Bueno & G.Heiden and *C. triantha* (Vell) Pruski. Occurrence in Brazilian states: GO = Goiás; MG = Minas Gerais; MS = Mato Grosso do Sul; PR = Paraná; RJ = Rio de Janeiro; RS = Rio Grande do Sul; SC = Santa Catarina; SP = São Paulo.

anthropic threats from deforestation, road construction, and accidental fires (Viana *et al.* 2005; Ribeiro *et al.* 2009) remain unchanged, which also corroborates the maintenance of the status. Thus, we propose that this species should be considered Endangered.

Remarks

Calea funkiana is part of the *C. triantha* group (*C. funkiana*, *C. pruskiana*, *C. subintegerrima*, and *C. triantha*) and further description of the four species in this group is provided by Bueno & Heiden (2022a).

Calea funkiana can be distinguished from *C. pruskiana* by the villous indumentum of the branches, peduncle, abaxial surface of leaves and outermost series of phyllaries (vs hispidulous to hispid or pubescent), cordate base leaf (vs usually subcordate, often rounded), generally less serrate leaves with 1–6 teeth (vs 5–13 teeth); inconspicuously striate outermost phyllaries (vs conspicuously striate), third series of phyllaries with acuminate apex (vs obtuse); generally shorter tube disc florets 1.6–2 mm long (vs 2–2.5 mm), and cypselae 2.75–3 mm long (vs 3.1–3.5 mm).

When compared to *Calea triantha*, *C. funkiana* differs by the villous indumentum of the branches, peduncle, abaxial surface of leaves and outermost series of phyllaries (vs generally hispidulous to hispid, rarely puberulous), leaf and of outer series of phyllaries with acute to acuminate apex (vs obtuse); commonly longer outermost series of phyllaries blade 7.6–15 mm long (vs 5.5–8 mm), third series of phyllaries blade 9–10.9 mm long (vs 5.1–7.9 mm), acuminate apex (vs obtuse), and paleae 9–10.5 mm long (vs 5.9–8.9 mm).

Calea marginata S.F.Blake
Figs. 2J, 3B, D, F, 5

Calea marginata S.F.Blake (Blake 1937: 387). – *Meyeria longifolia* DC. (Candolle 1836: 671). – *Calea longifolia* (DC.) Baker (Baker 1884: 260). – *Calea barrosoana* H.Rob. (Robinson 1979: 274).

Type material

BRAZIL • São Paulo-Paraná; 1828–1829; fl. fr.; *F. Sellow s.n.*; V.R. Bueno det. 2023; lectotype: P [02140741], designated by Bueno *et al.* 2025b; isolectype: G [G00456488].

Selected material examined

BRAZIL – **Paraná** • Jaguariaíva, Rio Diamante, proximidades do recanto da Prainha; 5 Dec. 1988; fl., fr.; *M. Silveira et al. 89*; V.R. Bueno det. 2021; FUEL [6105], HUFU [46636], UEC [54321] • Palmeira, Recanto dos Papagaios; 20 Jul. 2021; fl., fr.; *J.T. Motta et al. 4156*; V.R. Bueno det. 2021; MBM [389015]. – **São Paulo** • Ituverava, SP-258 km 324, margem do Rio Verde; 26 Feb. 1997; fl., fr.; *K. Matsumoto et al. 188*; V.R. Bueno det. 2021; UEC [100993] • Itararé, Estrada para Itararé; 4 Nov. 2018; fl., fr.; *C. Ribeiro et al. 301*; V.R. Bueno det. 2021; ICN [203042].

Description

Shrubs 0.3–1.5 m tall, sometimes herbs. Stems cylindrical, corrugate, glabrous or scabridulous, non-glandular, castaneous, internodes 1–30.8(–52.7) mm long. Leaves commonly decussate, rarely whorled, petiolate, petiole 0.1–2.9 mm long, rarely sessile; blades 0.93–5.2(–5.95) × 0.18–0.82(–1.2) cm, usually oblong or elliptic, rarely very narrowly elliptic or narrowly elliptic, base obtuse, chartaceous, generally slightly discolorous, rarely concolorous, green, apex commonly acute, sometimes truncate, rarely obtuse, venation acrodromous basal, secondary veins inconspicuous; margins slightly revolute, entire, thickened, white; abaxial surface generally densely glandular-foveate, rarely glandular-punctate,

adaxial surface glabrous. Capitulum solitary or capitulescence cymose dichasiform, slightly branched, axis 0–0.56(–4.43) mm long, branching with two orders of ramification, 2–4(–5) secondary branches; peduncle 0.2–2.95(–4.05) cm long, densely scabridulous or densely hispidulous, non-glandular. Capitulum heterogamous, radiate; involucre 7.1–14.7 × 8.4–18.9 mm, campanulate or hemispherical or cylindrical; phyllaries 5-seriate, margins entire; first series blade (7.1–)7.6–15.4(–18.8) × 2.9–4.4(–6.8) mm, usually longer than involucre, sometimes shorter, commonly longer than second series, sometimes equal, rarely shorter, usually narrowly elliptic or elliptic, sometimes oblanceolate, rarely narrowly lanceolate, apex rounded or truncate, margins slightly revolute or apex slightly revolute, middle white, glabrous, foliaceous, green, generally inconspicuously, rarely conspicuously, 2–4-striate; intermediate series usually glabrous, rarely sparsely glandular-punctate, middle or apex foliaceous, greenish yellow or green, commonly inconspicuously striate, rarely conspicuously; second series blade 8.5–13(–13.5) × 2.9–5.9 mm, usually narrowly obovate or oblanceolate, often panduriform, sometimes narrowly ovate, rarely oblong, apex commonly obtuse or rounded, sometimes truncate, margins middle or apex slightly revolute, middle or apex white, 4–6-striate; third series (7.4–)8–10.4(–12) × 3.1–5.4 mm, narrowly oblanceolate, oblanceolate, ovate or lanceolate, apex generally obtuse or acute, sometimes rounded, margins flat or apex slightly revolute, apex white, 8–12-striate; innermost series glabrous, scarious, pale yellow or yellow, conspicuously striate; fourth series 9.2–11.6 × 2.9–7.7 mm, usually narrowly

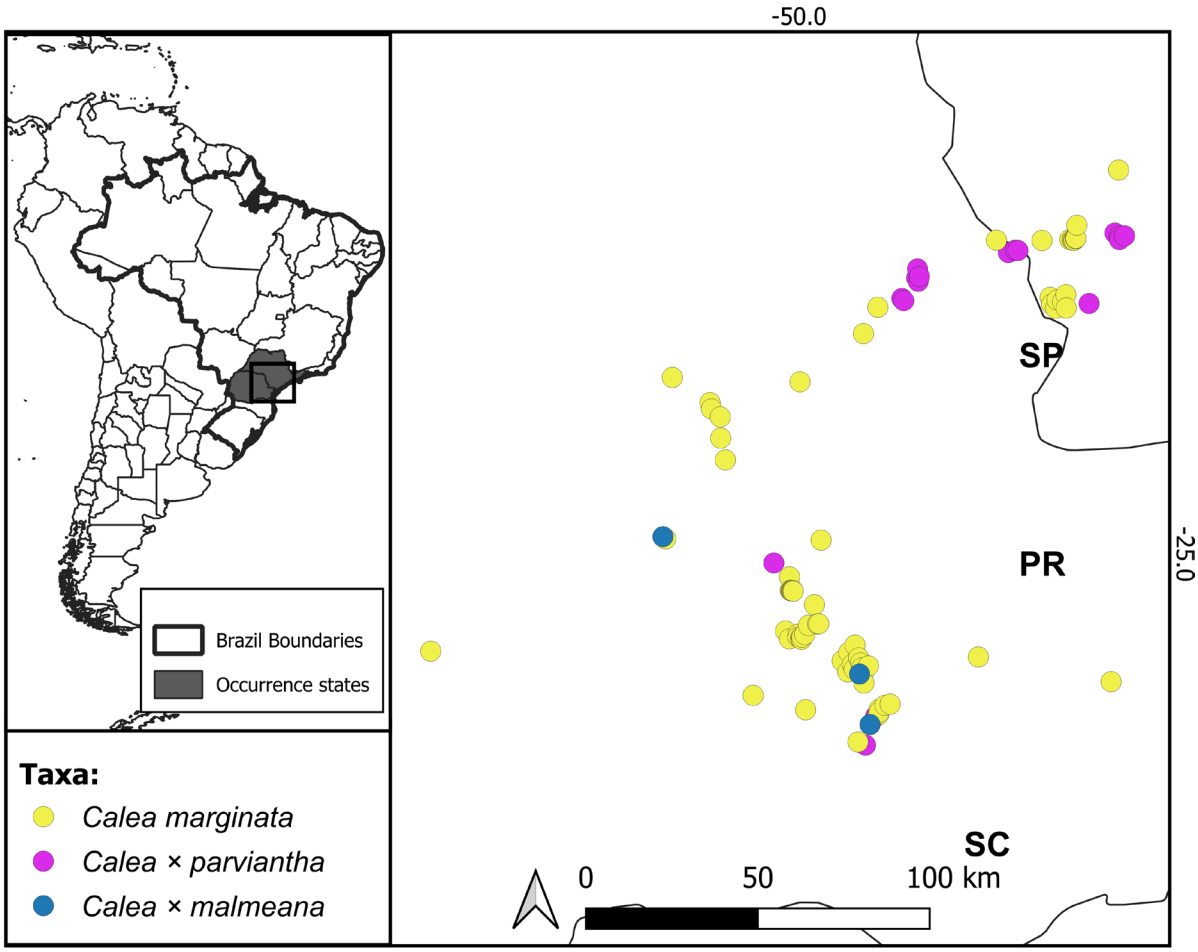

Fig. 5. Occurrence map of *Calea marginata* S.F.Blake, *Calea* × *parviantha* V.R.Bueno & G.Heiden, and *Calea* × *malmeana* V.R.Bueno & G.Heiden nothosp. nov. Occurrence in Brazilian states: PR = Paraná; SC = Santa Catarina; SP = São Paulo.

obovate, sometimes narrowly oblong or oblanceolate, rarely oblong or widely oblong or obovate, apex rounded, erose, 8–14-striate; fifth series (7.5–)9.5–10.7 × 2.3–2.7(–5.1) mm, commonly narrowly elliptic, sometimes narrowly oblong, narrowly obovate or oblanceolate, apex usually rounded or obtuse, rarely 3–4-lobulate, 6–12-striate. Receptacle slightly convex, holopaleaceous, paleae 6.7–9.2 × 1.1–2.1 mm long, longer than corolla disc, narrow, generally narrowly oblanceolate, sometimes narrowly elliptic, apex long acuminate, usually concave, often conduplicate, light yellow. Ray florets 12–18, pistillate, corolla 12.3–21.1 mm long, liguliform, yellow, tube 2.7–4.4(–4.9) mm long, limb 8.8–17.7 × 2.5–4.4(–6.3) mm, narrowly oblong or oblanceolate, apex commonly rounded or bilobed, sometimes acute, 5–7-veined, abaxial surface densely glandular-punctate or glandular-punctate, adaxial surface glabrous; style branches 0.6–1.2 mm long, linear, yellow. Disc florets 30–60, monoclinous, corolla 5–7.7 mm long, tubular, yellow, tube (1.5–)1.6–2.3 mm long, lobes 0.9–1.4 mm long, glabrous; anthers 2.3–2.9(–3.4) mm long, light yellow, anther appendages apically ovate; style branches 1–1.5 mm long, linear, yellow. Cypselae 2.3–3.4 mm long, prismatic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous, ribs usually glabrous or pilose, often glabrous to hirsute; pappus generally monotypic or bitypic, monolength, often bilength, free, scales 8–15 (with 1–3 distinctly longer, when present), mostly 0.4–1.2 mm long, longer 1–2.2 mm long, oblanceolate or oblong, apex usually obtuse or rounded, sometimes truncate, margins entire, apex erose.

Distribution, habitat and phenology

Calea marginata is an endemism of Brazil from the high-altitude grasslands of the Atlantic Forest of São Paulo and Paraná states (Fig. 5). This species inhabits wet grasslands, sometimes seasonally flooded, and riverine vegetation; at elevations of 800–1200 m. It was found flowering and fruiting throughout the year, except in September, mainly between November and May.

Informal conservation status

Endangered (EN) B2ab(ii,iii). *Calea marginata* has an EOO of 24 063.156 km² and an AOO of 328 km². While the EOO suggests Near Threatened (NT), the AOO indicates Endangered (EN). Like other taxa treated here that occur in the Área de Proteção Ambiental da Escarpa Devoniana (APAED) (Harfouche *et al.* 2019), much of its EOO is covered by forest vegetation where the species does not occur. According to Harfouche *et al.* (2019), the area of human impact has increased and the natural grasslands have decreased within the APAED, indicating that despite this being a conservation area, *Calea marginata* is not fully protected. It is estimated that there will be a decline in the area of occurrence with severe fragmentation (condition a and b) due to the impacts described by Harfouche *et al.* (2019). Within the APAED, this species is found in three state parks: Parque Estadual do Guartelá, Parque Estadual Vila Velha, and Parque Estadual do Cerrado; and in São Paulo State it is found in another park: Parque Ecológico Gruta da Barreira. Thus, we propose that this species should be considered Endangered.

Remarks

Calea marginata belong to *Calea myrtifolia* group (*Calea marginata*, *C. myrtifolia*, *C. parvifolia*, and *C. phyllolepis*).

The species that most closely resembles *Calea marginata* is *C. parvifolia*, these two species can be differentiated respectively by non-glandular stems and peduncles in the former (vs densely glandular-punctate), oblong or elliptic leaf (vs narrowly ovate or lanceolate), obtuse leaf base (vs rounded), basal acrodromous venation (vs reticulodromous), thick and white margin (vs thin and green); first (innermost) series of phyllaries with truncate or rounded apex (vs acute), non-glandular abaxial surface (vs glandular-punctate); non-glandular corolla of disc florets (vs glandular-punctate), and commonly shorter pappus scales (without consider the longer scale) 0.4–1.2 mm long (vs 1.1–2.3 mm)

Calea marginata is distinguishable from *C. myrtifolia* by striate stems (vs corrugate), oblong or elliptic leaf (vs ovate or lanceolate), obtuse leaf base (vs rounded), inconspicuous secondary veins (vs conspicuous), thick and white leaf margin (vs thin and green); first (innermost) series of phyllaries with white middle-margins (vs green), commonly longer phyllaries; first series of 7.6–15.4 mm long (vs 4.9–7.2 mm), second series of 8.5–13 mm long (vs 5–6 mm), third series of 8–10.4 mm long (vs 4.8–8.1 mm), and fourth series of 9.2–11.6 mm long (vs 8.1–9.7 mm).

Calea myrtifolia (DC.) Baker
Figs 2H, 6A, C, E, 7

Calea myrtifolia (DC.) Baker (Baker 1884: 260). – *Meyeria myrtifolia* DC. (Candolle 1836: 670).

Calea myrtifolia var. *paucidentata* Baker (Baker 1884: 260) – **Type**: BRAZIL – **Minas Gerais** • Catas Altas, Serra do Caraça; fl., fr.; *L. Riedel 1427*; V.R. Bueno det. 2023; lectotype: LE [not found], designated in Pruski 2023; isolectotypes: G [00412260], K [000323152], P [02469708, 02469709, 02469710].

Type material

BRAZIL – **Minas Gerais** • Diamantina; 1833; fl., fr.; *A.C. Vauthier 320*; V.R. Bueno det. 2023; lectotype: GDC [00456458], designated in Bueno *et al.* 2025b; isolectotypes G [00456458, 00222839], GH [00589157, 00589158], P [02140745, 02140746, 02140747], W [0043963].

Selected material examined

BRAZIL – **Minas Gerais** • Barão de Cocais, lower slopes of Serra do Caraça; 27 Jan. 1971; fl., fr.; *H.S. Irwin et al. 29263*; V.R. Bueno det. 2021; RB [177374], UEC [2506], US [2818873] • Diamantina, Parque Estadual do Biribiri, caminho para Casa dos Ventos; 10 Jan. 2020; fl., fr.; *V.R. Bueno 108*; V.R. Bueno det. 2021; ECT [9543], HUFU [81516], ICN [203006] • Ibiá, Fazenda Santa Terezinha; 10 May 1986; fl., fr.; *E.V.B. Paiva s.n.*; V.R. Bueno det. 2021; UEC [79328] • São Sebastião do Paraíso, arredores da cidade; 8 Apr. 1945; fl., fr.; *A.C. Brade 17649*; V.R. Bueno det. 2021; RB [52670].

Description

Shrubs 0.5–2.15 m tall. Stems cylindrical, striate, generally sparsely hirsute, sometimes sparsely puberulent or puberulent, rarely hispid, non-glandular, castaneous, internodes 3.2–24(–40) mm long. Leaves usually decussate, rarely decussate and whorled in the same stem, petiolate, petioles 0.9–2.5(–5.3) mm long; blades 0.79–6.03 × 0.36–3.08 cm, generally narrowly ovate, sometimes ovate or lanceolate, coriaceous, slightly discolorous, often concolorous, abaxial surface green, adaxial surface dark green or green, base rounded, apex acute, venation acrodromous basal, secondary veins conspicuous; margins usually revolute or slightly revolute, rarely flat, usually entire, often pauciserrate, sometimes oligoserrate, rarely multiserrate, 1–9(–13) teeth, 0.1–1.4(–2) mm long, commonly along the middle, sometimes base to middle or middle to apex, rarely just in base; abaxial surface usually glabrous, sometimes sparsely hirsute or sparsely scabridulous, rarely hispid, veins usually glabrous, sometimes sparsely scabridulous, rarely hispid or sparsely hirsute, glabrous or hispidulous, usually non-glandular, sometimes glandular-punctate, adaxial surface generally scabridulous, often glabrous. Capitulescence cymose dichasiform, slightly branched, axis 0–16.05(–24.05) mm long, 2–4 ramification orders, 2–14(–19) secondary branches; peduncle of capitulum 0.2–6.83(–9.55) cm long, usually pilose or hirsute, rarely puberulous, non-glandular, rarely glandular-punctate. Capitulum heterogamous, radiate. Involucre 5.9–11(–13) × 7.4–20 mm, generally hemispherical, often campanulate, rarely cylindrical; phyllaries 5-seriate, margins entire, conspicuously striate; outermost series of phyllaries foliaceous, green, usually scabridulous, sometimes glabrous, generally non-glandular, sometimes glandular-punctate; first series 4.5–7.2(–11.3) × 3.4–6 mm, usually

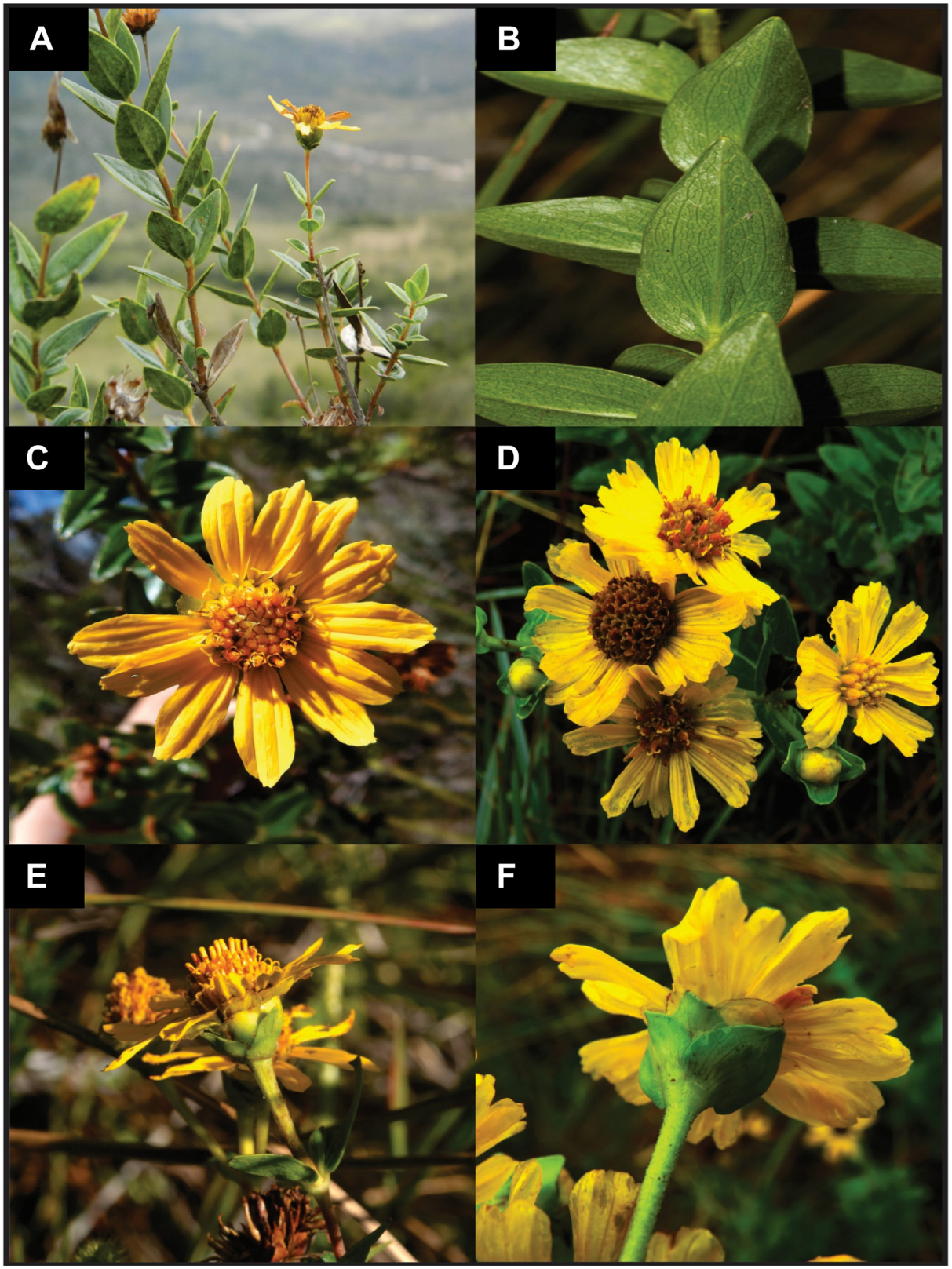

Fig. 6. *Calea myrtifolia* (DC.) Baker (A, C, E) and *Calea phyllolepis* Baker (B, D, F). Photos: A by D. Marques; B by M. Grings; C by J.F. Castro; D, F by G. Heiden; E by M. Kubo.

shorter than involucre, rarely longer or equal, usually longer than second series, sometimes shorter, rarely equal, commonly very broadly ovate to ovate, sometimes broadly elliptic to narrowly elliptic, apex acute or obtuse, margins usually revolute or slightly revolute, sometimes flat, 3–6-veined; second series 5–6(–10.4) × 3.2–5.3 mm, generally broadly ovate or ovate, sometimes elliptic or narrowly ovate, apex usually obtuse, sometimes acute, margins usually entire, rarely pauciserrate, revolute, 6–14-veined; third series 4.8–8.1 × 4–6.2 mm, broadly ovate, ovate, suborbiculate, broadly elliptic or very broadly oblong, apex generally obtuse, sometimes rounded, margins usually entire, sometimes apex erose, flat, glabrous, scabridulous or sparsely scabridulous, usually non-glandular, sometimes sparsely glandular-punctate, commonly scarious, often apex foliaceous, greenish yellow or light yellow, often apex green, 10–12-veined; innermost series with margins flat, glabrous, scarious, greenish yellow or light yellow; fourth series 8.1–9.7 × (3.2–)3.4–4.7(–6.2) mm, usually oblong, sometimes obovate, narrowly obovate or narrowly oblong, apex rounded, 10–14-veined; fifth series 8.5–10.7 × (1.6–)2.8–5.1 mm, generally narrowly oblong, often oblanceolate, sometimes narrowly obovate or obovate, apex usually rounded, rarely obtuse, 10–12-veined. Receptacle convex, holopaleaceous, with paleae 5.6–10 × 1–2 mm long, longer than corolla disc, narrow, generally narrowly oblong, often narrowly oblanceolate, rare narrowly elliptic, apex usually acuminate, rarely acute, concave, light yellow. Ray florets 8–20, pistillate, corolla liguliform, yellow, 9.9–17.5 mm long, tube 2.1–3.1 mm long, limb 7.7–14.5 × 2.5–4.2 mm, commonly

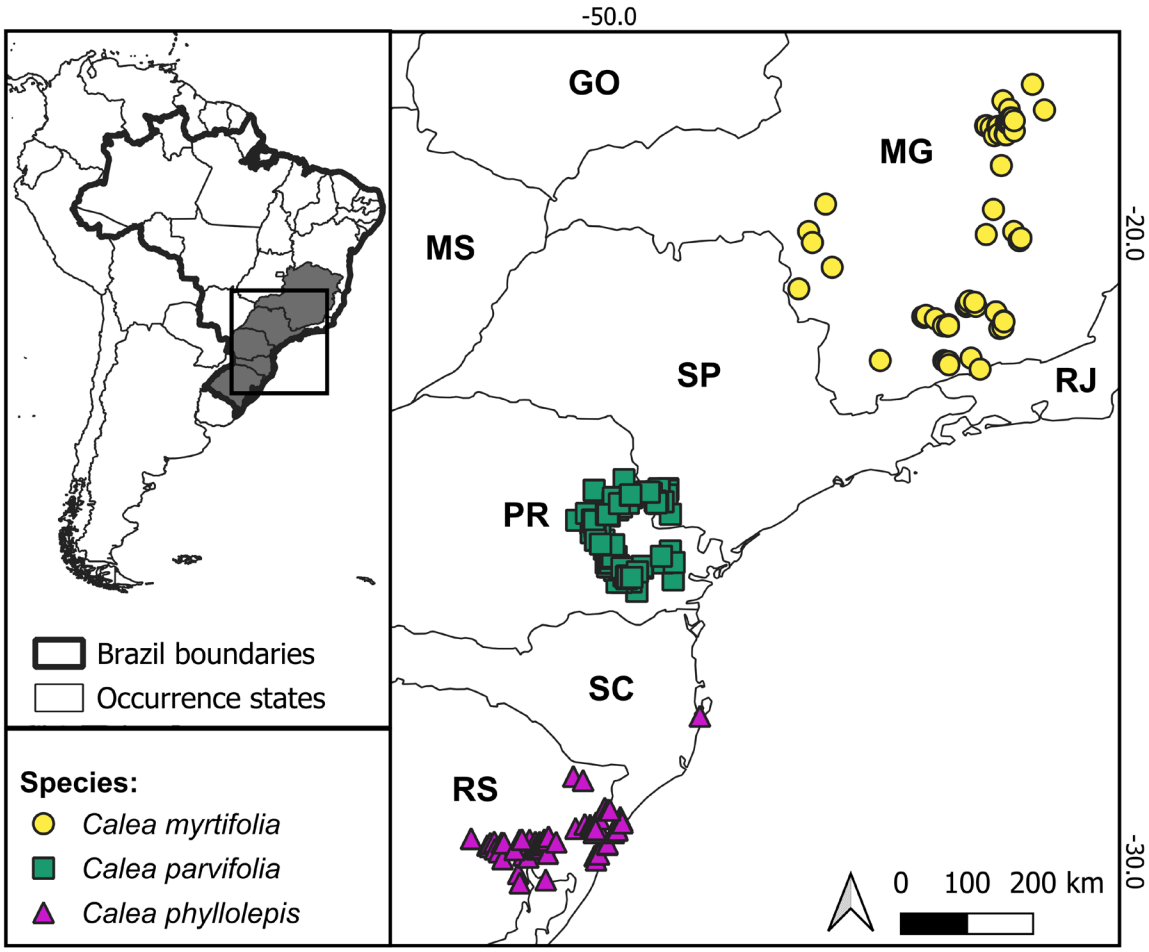

Fig. 7. Occurrence map of *Calea myrtifolia* (DC.) Baker, *Calea parvifolia* (DC.) Baker, and *Calea phyllolepis* Baker. Occurrence in Brazilian states: GO = Goiás; MG = Minas Gerais; MS = Mato Grosso do Sul; PR = Paraná; RJ = Rio de Janeiro; RS = Rio Grande do Sul; SC = Santa Catarina; SP = São Paulo.

narrowly oblong, sometimes elliptic, rarely very narrowly elliptic, apex acute, usually unlobed, rarely 2–3-lobed, 5–6-veined, abaxial surface usually sparsely glandular-punctate, rarely glandular-punctate, adaxial surface glabrous; style branches 1.0–1.2 mm long, linear, yellow. Disc florets 45–85, monoclinous, corolla tubular, yellow, 4.25–7 mm long, tube 1.2–2.2 mm long, lobes 0.8–1.2 mm long, glabrous; anthers 2.5–2.8 mm long, light yellow, anther appendages apically ovate; style branches 0.8–1.1 mm long, linear, yellow. Cypselae 2.5–3 mm long, generally prismatic, sometimes obconic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous, ribs sparsely pilose or pilose; pappus monotypic, monolength, free, formed by scales 10–14, 0.6–1.1 mm long, usually oblong, sometimes oblanceolate, apex obtuse or rounded, erose, margins entire.

Distribution, habitat and phenology

Calea myrtifolia occurs in Cerrado and the high-altitude grasslands of the Atlantic Forest exclusively in Minas Gerais (Bueno *et al.* 2023a) (Fig. 7); this occurrence is more restricted than previously recorded for this species (Pruski 2005). It inhabits cerrado rupestre, campo rupestre (Miola *et al.* 2021), riverine vegetation, wet grasslands associated with rock outcrops, sometimes floodable, and shrubby grasslands; at elevations of 950–1500 m. It species was collected flowering and fruiting throughout the year, but the highest number of collections is concentrated from January to March.

Informal conservation status

Endangered (EN) B2ab(ii,iii); C2a(i). *Calea myrtifolia* has an EOO of 254.329 km² and an AOO of 268 km². Like *Calea marginata*, *C. myrtifolia* has EOO and AOO indicating different threat categories, NT and EN, respectively. Interestingly, this species has an estimated AOO much larger than that of *C. marginata*, but a lower EOO due to fewer collection points. In addition to being restricted, formations of rupestrian grasslands and cerrado rupestre, as well as other formations associated with outcrops, are threatened by the impact of roads, accidental fire, and anthropic activity (Viana *et al.* 2005; Ribeiro *et al.* 2009; Miola *et al.* 2021; Pereira & Fernandes 2022). Due to this, it is estimated that there will be severe fragmentation coupled with a decline in the area of occupancy (B condition a, b). Recent collections made by the author and other collectors indicate that each subpopulation has fewer than 250 individuals (C2 condition a(i)). Thus, we propose that this species should be considered Endangered.

Remarks

Of late, Reis-Silva (2019) recommended the synonymization of *C. myrtifolia* var. *paucidentata* under *C. myrtifolia*, and more recently, Bueno (2023) also adopts the same criteria which is followed in this work. Among the eight species of *C.* subg. *Meyeria*, the one that most closely resembles *C. myrtifolia* is *C. phyllolepis*, and there were several identifications that confused one with the other. Together with *C. subintegerrima* and *C. triantha*, these form the most similar pairs of species within this subgenus.

Calea myrtifolia differs from *C. phyllolepis* by mainly entire leaves (vs mainly serrate), first series of phyllaries of 3.4–6 mm wide (vs 6.1–8.9 mm), generally shorter second series of 5–6 mm long (vs 6.1–11.3 mm), and usually ovate outermost series (vs frequently elliptic). In addition, these two species are allopatric: *C. myrtifolia* is restricted to Minas Gerais State, in the northern part of their combined range, while *C. phyllolepis* occurs in Rio Grande do Sul and Santa Catarina, farther south (Fig. 7).

Another taxon that is also allopatric and is misidentified with *C. myrtifolia* is *C.* × *parviantha* (occurs in São Paulo and Paraná, Fig. 5; a distribution range intermediate between *C. myrtifolia* to the north and *C. phyllolepis* to the south). Much of the material collected of this nothospecies were misidentified as *C. myrtifolia* (Bueno *et al.* 2023a). *Calea myrtifolia* differs from this nothospecies in having pilose or hirsute peduncles, rarely puberulous (vs hispid), second series of phyllaries of 5–6 mm long (vs 7–10.4 mm long), commonly broadly ovate to narrowly ovate shape, sometimes elliptic (vs obovate or

pandurifom or broadly elliptic), usually third series of phyllaries with 10–12 veins (vs 6–10), frequently shorter disc corolla lobes of 0.8–1.2 mm long (vs 1–1.7 mm long), glabrous cypselae apex (vs pilose or densely pilose), and scales of pappus frequently shorter of 0.6–1.1 mm long (vs 1.1–3 mm long).

Calea parvifolia (DC.) Baker
Figs 2F, 7, 8A, C, E

Calea parvifolia (DC.) Baker (Baker 1884: 259–260) – *Meyeria parvifolia* DC. (Candolle 1836: 670–671).

Type material

BRAZIL – **São Paulo-Paraná** • s.loc.; 1828–1829; fl., fr.; *F. Sellow s.n.*; V.R. Bueno det. 2021; lectotype: P [P02140753], designated in Bueno *et al.* 2025b; isolectotypes: B [destroyed] photo negative in F [244778]], G [G00456484].

Selected material examined

BRAZIL – **Paraná** • Balsa Nova, Ponte dos Arcos, próximo a Mata de Pinus; 2 Apr. 2019; fl. fr.; *A.L. Christ et al. 646*; V.R. Bueno det. 2021; ICN [203053] • Jaguariaíva, Fazenda Barros; 8 Feb. 1997; fl. fr.; *O.S. Ribas 1617*; V.R. Bueno det. 2021; E [83119], ESA [37427], FLOR [27993], MBM [208344], NY [784599], PEL [18221], SJRP [17738] • Tibagi, Guartelá, sítio Dona Júlia; 18 May 2014; fl., fr.; *E.L. Siqueira 757*; V.R. Bueno det. 2021; HCF [12765], MBM [391437]. – **São Paulo** • Itapeva, Estação Experimental; 23 Jun. 2009; fl., fr.; *R. Cielo-Filho 896*; V.R. Bueno det. 2023; SPSF [41742].

Description

Shrubs, rarely herbs, 0.15–1.5 m tall. Stems cylindrical, corrugate, puberulous, sparsely puberulent or puberulent, densely glandular-punctate, castaneous, internodes 3.5–20.2(–27) mm long. Leaves usually decussate, rarely decussate and whorled in the same stem, petiolate, petiole 0.5–2 mm long; blades 0.68–2.51(–2.91) × 0.26–1.28(–2.3) cm, narrowly ovate or lanceolate, chartaceous, concolorous, green, base rounded, apex acute, venation reticulodromous, secondary veins conspicuous; margins entire, flat; abaxial surface generally densely glandular-punctate, sometimes glandular-punctate, adaxial surface usually glabrous, sometimes margins sparsely scabridulous, non-glandular. Capitulescence usually cymose dichasiform, rarely with a capitulum solitary, slightly or profusely branched, unbranched or axis up to 20.58(–29.42) mm long, 2–4 ramification orders, secondary branches 2–18(–28); peduncle of capitulum 0.1–3.39(–4.17) cm long, glabrescent, usually puberulous or sparsely hispid, rarely sparsely hirsute, densely glandular-punctate. Capitula heterogamous, radiate, with involucres 6–10.7 × 5.3–13.4 mm, commonly campanulate, often hemispherical, rarely cylindrical. Phyllaries 5-seriate, margins flat; outermost series with apex acute, generally glandular-punctate, often densely glandular-punctate, rarely scabridulous, foliaceous, base scarious, pale green or green, inconspicuously veined; first series (7.6–)8.7–9.9(–11.1) × 3–5.7 mm, usually as long as the involucre length or shorter, sometimes equal, generally longer than second series, sometimes shorter, rarely equal, generally elliptic, rarely narrowly elliptic, margins commonly pauciserrate, rarely entire, 4–6-veined; second series 7.6–10.9 × 3.9–5.1 mm, generally elliptic, sometimes narrowly obovate, obovate or broadly elliptic, apex usually acute, sometimes obtuse, margins pauciserrate, generally glandular-punctate, often densely glandular-punctate, rarely scabridulous, 6–8-veined; third series 8.8–10.3 × 3.7–6.4 mm, generally narrowly obovate or sometimes obovate, apex acuminate, rarely obtuse, margins usually pauciserrate, rarely entire, glabrous, apex commonly densely glandular-punctate, rarely puberulent, scarious, foliaceous, greenish yellow or green, conspicuously 8–12-veined; innermost series scarious, greenish yellow or yellow, margins entire, conspicuously veined; fourth series (7.8–)9–10.3(–10.7) × 3.2–4.6(–5.4) mm, generally narrowly oblong or oblanceolate, sometimes oblong or narrowly obovate, apex rounded or 2–4-lobulate, usually densely punctate or only the apex densely punctate, rarely glabrous, 10–12-veined; fifth series (8.1–)9–10.2 × 2.2–3.6(–4.8) mm, generally narrowly

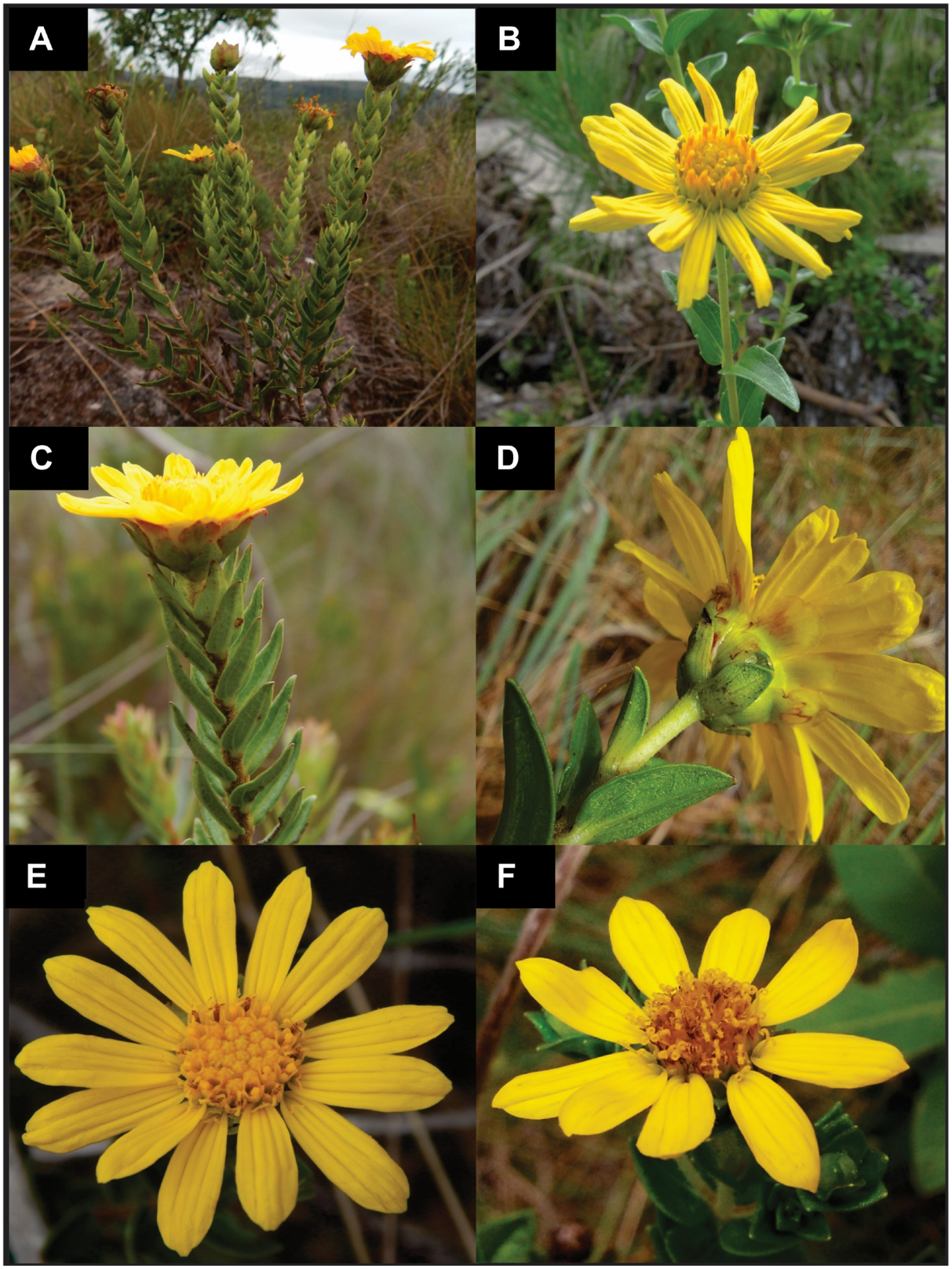

Fig. 8. *Calea parvifolia* (DC.) Baker (A, C, E) and *Calea* × *parviantha* V.R.Bueno & G.Heiden (B, D, F). Photos: A, C, E by B. Campos; B by G.A. Reis-Silva; D by R.T. Dall'Agnol; F by M. Silveira.

oblong, often narrowly obovate, sometimes oblanceolate, apex commonly rounded, sometimes obtuse, glabrous, 8–10-veined. Receptacles slightly convex, holopaleaceous, with paleae 5.6–10 × 1–2 mm long, usually longer than corolla disc length, rarely equal, narrowly elliptic, apex acute or long acuminate, concave, light yellow. Ray florets 10–18, pistillate, corolla liguliform, yellow, 12.5–17.6 mm long, tube 3–4.3 mm long, limb 9.3–13.5 × 2.6–3.8 mm, oblanceolate, rare broadly oblanceolate, apex 2–3-lobulate, 5–8-veined, abaxial surface densely generally glandular-punctate, sometimes glandular-punctate, adaxial surface glabrous; style branches 0.6–2 mm long, linear, yellow. Disc florets 35–70, monoclinous, corolla tubular, yellow, 5–7 mm long, tube 1.3–2.2 mm long, lobes 0.8–1.4 mm long, generally glandular-punctate, sometimes sparsely or densely glandular-punctate, yellow; anthers 2.3–3.2 mm long, light yellow, anther appendages apically ovate; style branches 0.8–1.4 mm long, linear, yellow. Cypselae 2.4–4.5 mm long, prismatic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous, pilose or densely pilose, ribs sparsely pilose to densely pilose; pappus generally monotypic, often bitypic, monolength or bilength, free, scales 9–12 (with 1–6 of them distinctly longer, when present), mostly 1.1–2.3 mm long, longer 1.4–3 mm long (when present), generally oblanceolate, often oblong or elliptic, apex obtuse, rounded or acute, erose, margins entire.

Distribution, habitat and phenology

Calea parvifolia is endemic to southeastern Brazil in high-altitude grasslands of the Atlantic Forest of southern São Paulo and Paraná states (Fig. 7). This species inhabits mainly grasslands associated with rock outcrops, as well as wet grasslands, sometimes seasonally flooded, and riverine vegetation; at elevations of 800–1400 m. It is found with flowers and fruits throughout the year, and less frequent in July and August.

Informal conservation status

Vulnerable (VU) B2ab(i,ii,iv). *Calea parvifolia* has an EOO of 452.228 km² and an AOO of 508 km². Most of its EOO encompasses forest areas where the species does not occur, as *C. parvifolia* occurs mainly in grassland habitats within the APAED and in the same state parks as *C. marginata* (Parque Estadual do Guartelá, Parque Estadual Vila Velha, and Parque Estadual do Cerrado). The populations are fragmented (B condition a), and the conversion of grasslands to anthropic pastures (Harfouche *et al.* 2019) represents a continuing threat, leading to inferred decline in extent of occurrence, area of occupancy, and habitat quality (B condition b). Although *C. parvifolia* appears to be the most abundant species in the group based on herbarium records, its restricted range and ongoing habitat degradation justify classification as Vulnerable. Thus, we propose that this species should be considered Vulnerable.

Remarks

This species is often misidentified as *Calea marginata* or *C. myrtifolia*, which are allopatric.

Calea parvifolia, compared with *C. marginata* and *C. myrtifolia*, shows corrugate and glandular-punctate stems (vs striate and non-glandular), reticulodromous venation leaf (vs acrodromous basal); inconspicuously veined outermost series of phyllaries (vs conspicuously striated), commonly longer first series 8.7–9.9 mm long (vs 4.9–7.2 mm), third series 8.8–10.3 mm long (vs 4.8–8.1 mm), narrowly obovate or obovate (vs broadly ovate, ovate, suborbiculate, broadly elliptic or broadly oblong); glandular-punctate disc corolla (vs non-glandular), usually with longer pappus scales of 1.1–3 mm long (vs 0.6–1 mm).

Calea parvifolia and *C. phyllolepis* are superficially morphologically similar allopatric species. The latter is endemic to southernmost Brazil (Santa Catarina and Rio Grande do Sul states), while *C. parvifolia* is distributed further north, endemic to São Paulo and Paraná. Morphologically the two latter species can be differentiated by the corrugate glandular-punctate stems (vs striate and non glandular stems), abaxial surface leaf and peduncle glandular-punctate (vs non-glandular), leaf reticulodromous venation (vs acrodromous basal), leaf margins flat (vs slightly revolute); inconspicuously veined outermost series of phyllaries (vs conspicuously striateveined), first series ones 3–5.7 mm wide (vs 6.1–8.9 mm wide), and narrowly elliptic paleae (vs narrowly oblanceolate or narrowly oblong).

Calea phyllolepis Baker
Figs 2I, 6B, D, F, 7

Calea phyllolepis Baker (Baker 1884: 260–261).

Type material

BRAZIL – **Rio Grande do Sul** • s.loc.; fl., fr.; *F. Sellow s.n.*; V.R. Bueno det. 2023; neotype: K [000323167], designated by Bueno *et al.* 2025b.

Selected material examined

BRAZIL – **Rio Grande do Sul** • Cambará do Sul, Serra do Faxinal, RS-427 próximo a divisa com Praia Grande; 8 Apr. 2019; fl., fr.; *G. Heiden & J.R.V. Iganci 2506*; V.R. Bueno det. 2023; ECT [8983], ICN [203057], MBM [431444] • Campo Bom, bairro Mônaco; 19 Jan. 1999; fl., fr.; *A. Knob & S.A.L. Bordignon 5884*; V.R. Bueno det. 2023; ICN [203058] • Osório, próximo à lagoa do Horácio; 1 Feb. 2020; fl., fr.; *V.R. Bueno & P.R. Bueno 113*; V.R. Bueno det. 2023; ECT [9544], HUFU [81513], ICN [203011]. – **Santa Catarina** • Florianópolis, Base Aérea, Ilha de Santa Catarina; 17 Feb. 1975; fl., fr.; *L.B. Smith et al. 16153*; V.R. Bueno det. 2023; FLOR [6250], US [2825081].

Description

Shrubs 0.3–1.5 m tall. Stems cylindrical, striate, generally puberulous or puberulent, rarely sparsely hirsute, non-glandular, castaneous, with internodes 10–27.2(–53) mm long. Leaves decussate or decussate and whorled in the same stem, petiolate, petiole 0.9–3 mm long; blades 1.4–4.95 × 0.75–2.4(–2.55) cm, narrowly ovate, often ovate, sometimes lanceolate, coriaceous, usually discolorous, rarely concolorous, abaxial surface green, adaxial surface dark green, base rounded, apex commonly acute, rarely attenuate, venation acrodromous basal, secondary veins conspicuous; margins generally slightly revolute, sometimes revolute, thin, green, generally oligoserrate or pauciserrate, rarely entire or multiserrate, 1–11(–14) teeth, 0.3–1.5 mm long, commonly along the middle, sometimes base to middle or middle to apex or along the margins; abaxial surface generally glabrous, rarely veins sparsely puberulent, surface adaxial commonly glabrous, rarely margins sparsely scabridulous. Capitulescence cymose dichasiform, slightly branched to branched, axis 0–11.6(–22.85) mm long, 2nd–3rd order ramifications, rarely 4th order, 2–12(–18) secondary stems; peduncle 0.45–8 cm long, commonly densely puberulous, sometimes puberulous, non-glandular. Capitulum heterogamous, radiate; involucre 5–10.3 × 7.7–14.7(–15.9) mm, usually hemispherical, often campanulate. Phyllaries 5-seriate, rarely 6-seriate, margins thin, conspicuously striate; outermost series of phyllaries apex generally obtuse, rarely acute, margins entire, generally flat, rarely slightly revolute, commonly glabrous, rarely glandular-punctate, foliaceous, green; first series 6.5–12.6(–14.4) × 6.1–8.9(–9.4) mm, usually longer than involucre, sometimes shorter, rarely equal, commonly longer than second series, sometimes shorter, rarely equal, generally suborbiculate, often orbiculate, sometimes ovate to narrowly ovate or elliptic to widely elliptic, 6–10-striate; second series 6.1–11.3(–12.6) × 4.6–8.6(–9) mm, commonly suborbiculate to orbiculate, sometimes widely elliptic to elliptic or very widely oblong to oblong, 8–12-striate; third series 4.3–10.1 × (3.5–)4.1–5.8(–6.2) mm, usually very widely oblong to oblong, often widely ovate to ovate, rarely widely elliptic, apex generally obtuse, sometimes rounded, margins entire, flat, glabrous, commonly scarious, rarely apex foliaceous, generally greenish yellow to yellowish, rarely greenish yellow to green, 8–12-striate; innermost series of phyllaries margins entire, glabrous, scarious, greenish yellow to yellow; fourth series 5.2–11 × 3.2–5.1 mm, generally widely oblong or oblong, sometimes narrowly ovate or elliptic, apex commonly rounded, rarely obtuse, margins ciliate, 12–16-striate; fifth series 8.7–11.2 × 2.3–4.2(–5) mm, widely oblong to narrowly oblong or narrowly obovate to oblanceolate, apex rounded, 10–15-striate; sixth series 10.2–10.6 × 2.6–3.5(–5) mm, narrowly elliptic, apex rounded, 10–14-striate. Receptacle convex, holopaleaceous, paleae 6.5–9.7 × 0.9–1.8 mm long, usually longer than corolla disc, rarely shorter, narrowly oblanceolate or narrowly oblong, apex long

acuminate, concave, light yellow. Ray florets 12–18, pistillate, corolla 12.6–18.8 mm long, liguliform, yellow, tube 1.8–3.8 mm long, limb 10.1–14.4 × 3.1–5.1(–5.7) mm, commonly oblanceolate, often narrowly oblong to oblong, sometimes widely oblanceolate, apex bilobed or 3-lobulate, 5–7-veined, abaxial surface glandular-punctate to sparsely punctate, adaxial surface glabrous; style branches 1–1.8 mm long, linear, yellow. Disc florets 50–80, monoclinous, corolla 5.1–6.9 mm long, tubular, yellow, tube 1–2.2(–2.7) mm long, lobes (0.7–)1–1.6 mm long, glabrous; anthers 2.4–3.3 mm long, light yellow, anther appendages apically ovate; style branches 1.2–1.6 mm long, linear, yellow. Cypselae 2.4–3.1 mm long, obconic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous or sparsely pilose, ribs pilose or densely pilose; pappus monotypic, monolength or bilength, free, scales 10–14 (2–3 distinctly longer, when present), mostly 0.7–1.6 mm long, longer 1.3–2.2 mm long (when present), generally oblanceolate or oblong, rarely elliptic, apex commonly obtuse, sometimes acute, margins entire, apex erose.

Distribution, habitat and phenology

Calea phyllolepis occurs only in the Atlantic Forest from Rio Grande do Sul and Santa Catarina (Fig. 7), this is an occurrence more restricted than previously considered for the species (Pruski 2005). It occurs in humid sites, riverine vegetation, and grasslands associated with rock outcrops. This is the species with the highest altitudinal variation of occurrence in the subgenus, as the specimens occur at elevations from 1–1005 m. Flowering and fruiting specimens were collected from August to May, but with a greater number of collections from November to April, highlighting the months of December, January, and February.

Informal conservation status

Endangered (EN) B2ab(ii,iii). *Calea phyllolepis* has an EOO of 36 750.818 km² and an AOO of 336 km². While the EOO suggests Near Threatened (NT), the AOO qualifies for Endangered (EN). Due to specimen records from Florianópolis, the EOO extends across much of the state of Santa Catarina, but the species has been found only in the densely populated state capital and on the border with Rio Grande do Sul. After 50 years without being found in Florianópolis, Santa Catarina, the species was found again, collected by *J. Paula-Souza 14215* (Appendix 1). The populations are fragmented (B condition a). *Calea phyllolepis* occurs in habitats, which are threatened by agriculture, urbanizations and forestry (Bond & Parr 2010; Andrade *et al.* 2016), leading to a continuing decline inferred in area of occupancy and habitat quality (B condition b). Thus, we propose that this species should be considered Endangered.

Remarks

The species that most resembles *C. phyllolepis* morphologically is *C. myrtifolia*, these have already been compared. Thus, we will compare here with *C. marginata*, this is the last species comparison within the *Calea myrtifolia* group.

Calea phyllolepis differs from *C. marginata* by striate stems (vs corrugate), ovate to lanceolate blade leaf (vs oblong to elliptic), rounded base (vs obtuse), conspicuous secondary veins (vs inconspicuous), thin and olivaceous margins (vs thick and white); commonly wider first series 6.1–8.9 mm wide (2.9–4.4 mm), conspicuously striate first series (vs inconspicuously), foliaceous second series of phyllaries (vs middle or ⅔ scarious), and suborbiculate to widely elliptic of second series (vs obovate to oblanceolate, pandurifom, ovate or oblong).

Calea pruskiana V.R.Bueno & G.Heiden
Fig. 2C, 9

Calea pruskiana V.R.Bueno & G.Heiden (Bueno & Heiden 2022: 576). – *Meyeria pruskiana* (V.R.Bueno & G.Heiden) Pruski (Pruski 2023: 98).

Type material

BRAZIL – **São Paulo •** Campos do Jordão, Trilha do Rio Sapucaí, Parque Estadual de Campos do Jordão; 4 Feb. 1988; fl., fr.; *M.J. Robim & J.P.M. Carvalho 530*; V.R. Bueno det. 2023; holotype: UEC [101499]; isotype: SPSF [11784].

Selected material examined

BRAZIL – **Minas Gerais •** Delfim Moreira, estrada entre a fazenda Boa Esperança e a fazenda do Onça; 20 Mar. 2011; fl., fr.; *A.L. Gasper et al. 2746*; V.R. Bueno det. 2023; BHCB [147566], FURB [36216]. – **São Paulo •** Horto Florestal, trilha do Rio Sapucaí; 6 Jul. 1992; fl., fr.; *E. Martins et al. 26471*; V.R. Bueno det. 2023; UEC 69774 • Parque Estadual de Campos do Jordão; 18 Mar. 1975; fl., fr.; *L.E. Melo-Filho & M. Emmerich 4090*; V.R. Bueno det. 2023; R [136970].

Description

Shrubs, 0.45–1.3 m tall. Stems cylindrical, striate, densely or sparsely hispid, non-glandular, castaneous, with internodes 7.6–29.4 mm long. Leaves decussate, petiolate, petiole 0.7–2.8 mm long; blades 1.15–2.43(–3.12) × 0.92–2.3 cm, generally broadly ovate, often ovate, sometimes very broadly ovate, coriaceous, green, commonly slightly discolorous, often concolorous, base subcordate, often rounded, apex generally acute, sometimes attenuate, venation acrodromous basal, secondary veins conspicuous; margins slightly revolute, thin, green, commonly oligoserrate, sometimes multiserrate, rarely pauciserrate, (3–)5–13 teeth, 0.5–2.4 mm long, usually along the margins, sometimes from the base to the middle; abaxial surface hispid, hispidulous or densely hispid, veins densely hispid or hispidulous, glandular-punctate or densely glandular-punctate, adaxial surface scabrid or glabrous, margins scabridulous, non-glandular. Capitulescence commonly cymose dichasiform, rarely solitary capitulum, generally slightly branched, sometimes branched, axis 1.74–7.68(–22.24) cm long, branching to 2nd–3rd order ramifications, rarely 4th order, 2–10(–16) secondary stems; peduncle 0.17–6.84 cm long, commonly sparsely hispid to hispid, sometimes hispidulous, non-glandular. Capitulum heterogamous, radiate, involucrum 6.6–12 × 8.6–14.8 mm, hemispherical or campanulate. Phyllaries 5-seriate, conspicuously striate, margins entire, thin; outermost series of phyllaries apex acute, foliaceous, green, 5–7-striate; first series of phyllaries 7.5–9.9 × 3.5–7.2 mm, shorter than or equal to involucre, longer or equal than second series, commonly elliptic, often widely elliptic, rarely lanceolate, margins entire, generally middle revolute, rarely apex revolute, commonly hispid to hispidulous, often puberulous to glabrescent, generally glandular-punctate, often sparse glandular-punctate; second series (5–)7.6–10 × 3.4–6.2 mm, commonly elliptic, often oblanceolate, apex obtuse, margins apex usually revolute, sometimes middle revolute, pubescent to puberulous or hispid to sparse hispidulous, commonly glandular-punctate, sometimes sparse glandular-punctate; third series 6.2–8.1 × 3.5–4.4 mm, oblong or ovate, apex obtuse, margins generally flat, often apex revolute, sparsely hispidulous or sparsely pubescent, glandular-punctate or non-glandular, foliaceous or scarious with apex foliaceous, green or yellowish green with green apex, 5–10-striate; innermost series scarious, yellowish green to yellow, glabrous, apex erose; fourth series 7–10.2 × 4.2–5.7 mm, commonly oblong to obovate, sometimes widely oblong, apex rounded or obtuse, 12–13-striate; fifth series 9–11.1 × 2.3–5 mm, usually obovate, sometimes oblanceolate, apex commonly rounded, often obtuse, 10–12-striate. Receptacle slightly convex, holopaleaceous; paleae 8.7–9.3 × 1.3–1.9 mm, longer than corolla disc, oblong to oblanceolate, apex long-acuminate, conduplicate, light yellow. Ray florets 10–15, pistillate, corolla liguliform, yellow, 14.7–17 mm long, tube 2.4–3.2 mm long, limb 11.5–14.3 × 3.5–5.7 mm, generally obovate, often oblong to lanceolate, apex commonly obtuse, sometimes 2–3-lobulate or rounded, 4–5 veins; abaxial surface commonly glandular-punctate, sometimes densely glandular-punctate, surface adaxial glabrous; style branches 1–1.2 mm long, yellow. Disc florets 40–50, monoclinous, corolla tubular, yellow, 5.3–6.7 mm long, tube 2–2.5 mm long, lobes 1.1–1.7 mm long, glabrous; anthers 2.8–3 mm long, light yellow, anther appendages apically ovate; style branches 1.2–1.5 mm long, linear. Cypselae 3.1–3.5 mm long, prismatic or obconical, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous to pilose, often sparsely

pilose or glabrous, ribs densely pilose; pappus generally bitypic, sometimes monotypic, monolength and bilength, sometimes exclusively monolength, free, scales 10 (1–3 distinctly longer, when bilength), mostly 0.7–1.5 mm long, longer scales 1.3–2.5 mm long (when present), generally narrowly elliptic, often oblong or oblanceolate, apex obtuse or acuminate, margins entire, apex erose.

Distribution, habitat and phenology

Calea pruskiana occurs only in two municipalities: Campos do Jordão (São Paulo State) and Delfim Moreira (Minas Gerais State) in Southeastern Brazil (Fig. 9). It grows in high-elevation grasslands in the Atlantic Forest and is generally found in recently burned areas, along roadsides, riverine vegetation, and in humid soil; it occurs at elevations at 1400–1500 m. *Calea pruskiana* probably blooms and fructifies in the first semester, except May. February and March are the months with the highest number of materials collected.

Informal conservation status

Critically Endangered (CR) B1ab(iii). No new collections of *C. pruskiana* have been recorded since the original description (Bueno & Heiden 2021), so the EOO of 39.135 km² and the AOO of 24 km² are maintained. Of these two, the suggested status due to the EOO value is adopted for the species. Of the

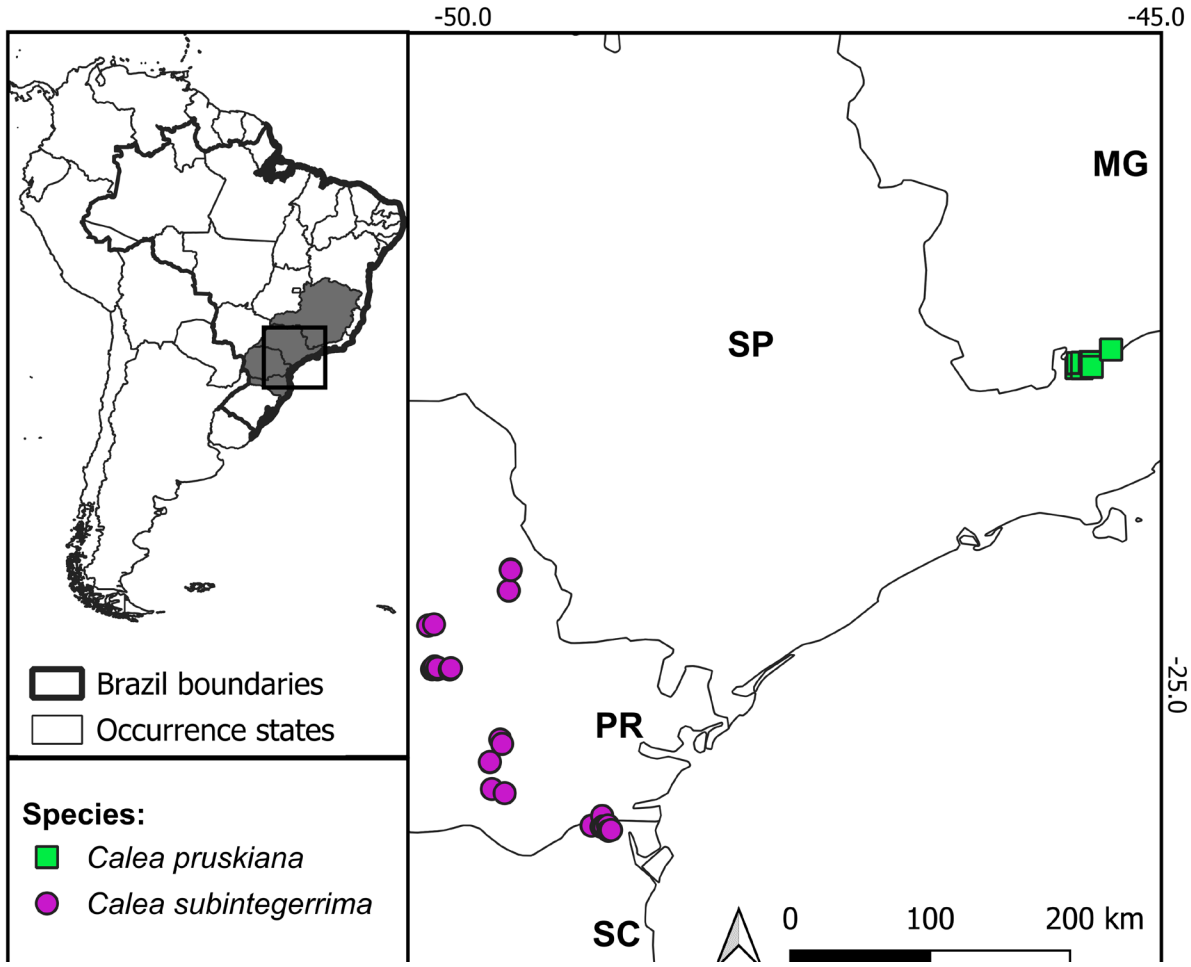

Fig. 9. Occurrence map of *Calea pruskiana* V.R.Bueno & G.Heiden and *Calea subintegerrima* (Malme) V.R.Bueno & G.Heiden. Occurrence in Brazilian states: MG = Minas Gerais; PR = Paraná; SC = Santa Catarina; SP = São Paulo.

eleven recorded collection points, six are from a protected area: Parque Estadual de Campos do Jordão. However, the combination of agricultural activities, urbanization, and logging represents serious threats to this species (Bond & Parr 2010; Andrade *et al.* 2016). The populations are severely fragmented (B condition a), and there is a continuing decline inferred in habitat quality (B condition b), particularly concerning given that this is the species with the smallest AOO in the group. Therefore, we propose that this species should be considered Critically Endangered.

Remarks

Calea pruskiana is morphologically similar to *C. triantha*, but differs in the subcordate or rounded base (vs cordate); slightly branched capitulescence (vs profusely branched), mostly longer phyllaries: first series 7.5–9.9 mm long (vs 6–8 mm), second series 7.6–10 mm long (vs 5.1–7.8 mm), fifth series 9–11.1 mm long (6.6–8.2 mm), first series with apex acute (vs obtuse); and generally longer ray corolla 14.7–17 mm long (vs 8–13.6 mm).

Another similar species is *C. subintegerrima*; *C. pruskiana* is distinguished from it by abaxial surface leaf hispid to hispidulous or densely hispid (vs commonly glabrous, often strigose, rarely sparsely hispidulous); usually sparsely hispid to hispid, sometimes hispidulous to hispid peduncle (vs commonly strigose, often strigose to sparsely hispidulous), generally longer first series of phyllaries 7.5–9.9 mm long (vs 4.5–7.7 mm), with acute apex (vs generally rounded, sometimes obtuse), second series of phyllaries pubescent to puberulous or hispid to sparsely hispidulous (vs commonly sparsely strigose, often glabrous), frequently longer paleae 8.7–9.3 mm long (vs 5.5–8.4 mm); more ray florets per capitulum 10–15 (vs 6–10), cypselae 3.1–3.5 mm long (vs 2.4–2.9 mm), and densely pilose ribs (vs commonly hirsute, sometimes sparsely hirsute).

Calea subintegerrima (Malme) V.R.Bueno & G.Heiden
Figs 2B, 9, 10B, D, F

Calea subintegerrima (Malme) V.R.Bueno & G.Heiden (Bueno & Heiden 2022: 576). – *Calea hispida* f. *subintegerrima* Malme (Malme 1933: 94). – *Meyeria subintegerrima* (Malme) Pruski, (Pruski 2023: 99–100).

Type material

BRAZIL – **Paraná** • Jaguariaíva; 5 Feb. 1910; fl., fr.; *P.H.K. Dusén 9187*; V.R. Bueno det. 2023; lectotype: GH [H00589132], designated by Bueno & Heiden 2021; isolectotypes: G [digital image!], GH [00222849], S [S-R-875].

Selected material examined

BRAZIL – **Paraná** • Balsa Nova, Ponte dos Arcos,; 29 Mar. 2005; fl., fr.; *C. Kozera & R. Kersten 1997*; V.R. Bueno det. 2023; HCF [21741], MBM [335478] • Campo Largo, Serra de São Luís do Purunã; 7 Apr. 1946; fl., fr.; *G. Hatschbach et al. 265*; V.R. Bueno det. 2023; MBM [39764] • Tibagi, Parque Estadual do Guartelá; 30 Jan. 2015; fl., fr.; *L.A. Souza 250*; V.R. Bueno det. 2023; HUFU [70941]. – **Santa Catarina** • Campo Alegre, Serra do Quiriri; 13 Feb. 2021; fl., fr.; *A.C. Scharmach & F. Rudnick 1*; V.R. Bueno det. 2023; ICN [203071] • Rodeio Grande; 10 Jan. 1992; fl., fr.; *O.S. Ribas & J. Cordeiro 423*; V.R. Bueno det. 2023; MBM [149201], PEL [15575; UB [52190].

Description

Shrubs sometimes perennial herbs 0.45–1.3 m tall. Stems cylindrical, striate, generally sparsely hispidulous to hispid, sometimes sparsely hispid to glabrous, rarely sparsely strigose, non-glandular, castaneous or green, internodes 4.4–14.8(–19.1) mm long. Leaves decussate, petiole 0.4–1.9 mm long;

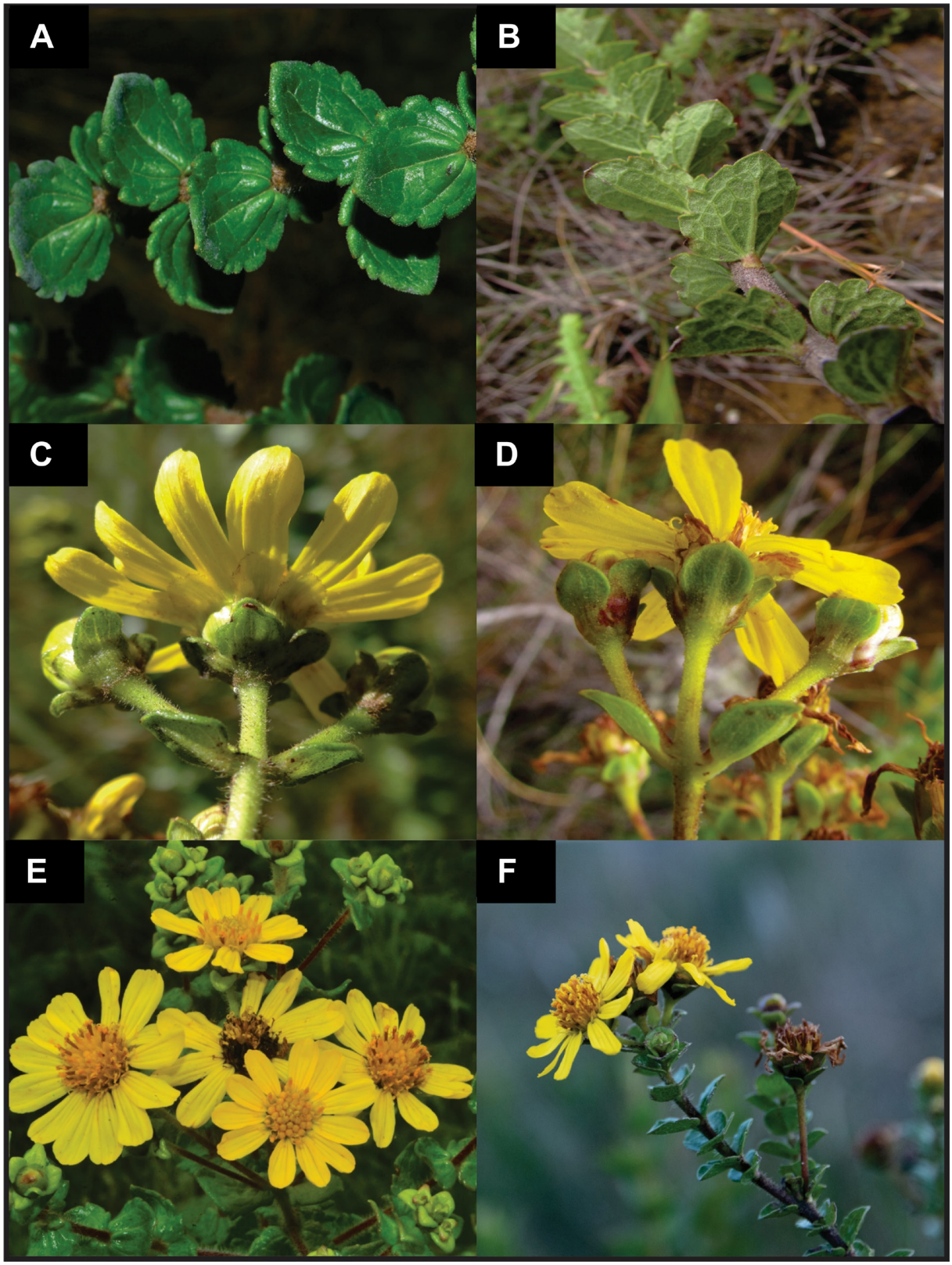

Fig. 10. *Calea triantha* (Vell.) Pruski (A, C, E) and *Calea subintegerrima* (Malme) V.R.Bueno & G.Heiden (B, D, F). Photos: A, E by P. Schirkowski; B, D by L. Funez; C by E. Lozano; F by A.C. Scharmach.

blades 0.67–1.73 × 0.52–1.68(–1.92) mm, generally widely ovate, often very widely ovate, rarely ovate coriaceous, commonly discolorous or slightly discolorous, rarely concolorous, adaxial surface dark green, abaxial surface usually green, rarely green, base generally subcordate, often rounded, apex commonly acute, sometimes obtuse, venation acrodromous basal, secondary veins conspicuous; margins generally slightly revolute, sometimes revolute, thin, green, commonly pauciserrate, sometimes oligoserrate or entire, 1–10 teeth, 0.1–2.0 mm long, commonly from the base to middle, sometimes just in the middle; abaxial surface commonly glabrous, often strigose, rarely sparsely hispidulous, veins generally glabrous, sometimes strigose, rarely sparse hispidulous, densely glandular-punctate, adaxial surface glabrous, margins scabridulous, non-glandular. Capitulescence cymose dichasiform, slightly branched or branched, axis 0–9.54(–23.99) cm long, branching to 2–3 ramification orders, rarely to 5 orders, 2–9 secondary stems; peduncle 0.10–2.83 cm long, usually strigose, often strigose to sparsely hispidulous, commonly non-glandular, often glandular-punctate. Capitulum heterogamous, radiate, involucrum 5.5–11.4(–12.7) × 5.5–10.9(–13.8) mm, usually cylindrical, often campanulate. Phyllaries 5-seriate, margins thin, conspicuously striate, rarely inconspicuously striate; outermost series of phyllaries margins generally entire, rarely pauciserrate, densely glandular-punctate or glandular-punctate, foliaceous, green; first (innermost) series 4.5–7.7(–9.4) × 2.7–5.4(–7.8) mm, commonly shorter than involucre, rarely longer or equal, usually longer or equal than second series, sometimes shorter, generally obovate to narrowly obovate or widely elliptic, sometimes oblanceolate, rarely suborbicular, apex commonly obtuse, sometimes rounded, middle revolute or flat, commonly glabrous, sometimes sparsely strigose to glabrous, 6–8-striate; second series (4.7–)5.6–7.4(–8.4) × 2.7–6.3(–6.7) mm, usually panduriform, rarely oblong or widely oblong, apex commonly obtuse, often rounded, margins apex revolute or flat, generally sparsely strigose, often glabrous to strigose, 8–9-striate; third series 5–8.2 × 2.6–4.5(–6.8) mm, generally narrowly ovate, often ovate, rarely panduriform or widely oblong, apex obtuse, rarely rounded or attenuate or acute, margins entire, rarely apex revolute, glabrous, sometimes strigose, usually sparsely to densely glandular-punctate in apex, sometimes densely punctate or non-glandular, commonly foliaceous or scarious with apex foliaceous, sometimes scarious, green or yellowish green with apex green, conspicuously striate, 8–10-striate; innermost series margins entire, glabrous, scarious, yellowish green; fourth series 5.8–10 × (2.1–)2.6–4.1(–5.6) mm, generally narrowly ovate, sometimes oblong to obovate, apex commonly rounded, sometimes obtuse, 10–13-striate; fifth series 6.8–9.5(–10) × 1.4–3(–4.4) mm, generally narrowly oblong or oblanceolate or narrowly elliptic, rarely lanceolate, apex commonly rounded or obtuse, sometimes acute, 8–10-striate. Receptacle slightly convex, holopaleaceous; paleae 5.5–8.4(–9.2) × 0.8–2.1 mm, usually longer than corolla disc, rarely equal, commonly narrowly oblanceolate, rarely narrowly oblong, apex long-acuminate, generally concave, sometimes conduplicate, light yellow. Ray florets 6–10, pistillate, corolla liguliform, yellow, 9.5–13.1 mm long, tube 1.6–2.3(–3.5) mm long, limb 7.8–11.5 × 2.5–4.9(–7) mm, commonly obovate or narrowly obovate, rarely narrowly elliptic or widely oblong, apex generally 3–4-lobulate, often rounded, sometimes obtuse or acuminate, 5–7 veins, abaxial surface commonly glandular-punctate, often sparsely glandular-punctate, adaxial surface glabrous; style branches 0.8–1.6 mm long, linear, yellow. Disc florets 15–45, monoclinous, corolla tubular, 4.2–7.3(–7.9) mm long, tube 1.3–2.3(–2.9) mm long, lobes 1–1.9 mm long, glabrous; anthers (2.1–)2.4–2.9(–3.4) mm long, light yellow, anther appendages apically ovate; style branches 1–1.2 mm long, linear, light yellow. Cypselae 2.4–2.9 mm long, prismatic or obconical, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, faces generally glabrous, sometimes sparsely hirsute or hirsute, ribs commonly hirsute, sometimes sparsely hirsute; pappus generally monotypic, often bitypic, commonly monolength, sometimes bilength and monolength, rarely exclusively bilength, free, scales 10–14 (1–3 distinctly longer, when bilength), mostly 0.6–2.2 mm long, longer scales 1.7–4.5 mm long (when present), usually oblanceolate or narrowly elliptic, sometimes oblong, apex commonly obtuse, sometimes acute, margins entire, apex erose.

Distribution, habitat and phenology

Calea subintegerrima occurs in southeastern Paraná and in northeastern Santa Catarina (Fig. 9). It grows in high-elevation grasslands of the Atlantic Forest and is mostly found in open grasslands, anthropized

areas, riverine vegetation, hillsides, rock outcrops, and in kaolin deposits; at elevations of 850–1360 m. *Calea subintegerrima* was found flowering and fruiting from November to April, mostly January to March with single collections in the other months.

Informal conservation status

Endangered (EN) B2ab(iii). *Calea subintegerrima* has an EOO of 13 512.842 km² and an AOO that has increased by 4 km² since Bueno & Heiden (2022a), now totaling 96 km². As with other taxa from the states of Paraná and Santa Catarina, the estimated EOO includes extensive forest areas where the species does not occur, making the AOO a more accurate indicator of the species' range and threat status. Only 40% of the specimens were collected within protected areas (Área de Proteção Ambiental Campos do Quiriri, Reserva Florestal Passa Dois, Parque Estadual do Guartelá, and Parque Estadual do Monge). The populations are severely fragmented (B condition a), and due to the anthropic pressures common to grassland areas (Harfouche *et al.* 2019), there is a continuing decline inferred in habitat quality (B condition b). Thus, we propose that *C. subintegerrima* should be considered Endangered.

Remarks

Calea subintegerrima is morphologically similar to *C. triantha*, and they are distinguished by subcordate to rounded leaf base (vs cordate); generally strigose peduncle, sometimes strigose to hispidulous (vs hispid to hispidulous), glandular-punctate peduncle (vs non-glandular), branched or slightly branched capitulescence (vs profusely branched), first series of phyllaries commonly glabrous, sometimes sparse strigose to glabrous (vs commonly hispidulous to glabrescent, rarely scabrid), second series of phyllaries generally panduriform, rarely oblong or widely oblong (vs generally oblanceolate, sometimes widely ovate or elliptic), 8–9 striate (vs 4–6).

When compared to *C. funkiana*, *C. subintegerrima* can be distinguished by hispidulous to hispid to glabrous (vs villose), generally glabrous or strigose, rarely sparsely hispidulous abaxial surface leaf (vs villose); strigose to sparsely hispidulous peduncle (vs villose), outermost series of phyllaries with apex rounded or obtuse (vs acute or attenuate), second series of phyllaries panduriform or oblong (vs widely elliptic or ovate to deltoid), third series of phyllaries 8–10 striate (vs 4–6), paleae commonly shorter 5.5–8.4 mm long (vs 9–10.5 mm); ray floret corolla frequently shorter 9.5–13.1 mm long (13–16 mm), and cypselae angles hirsute (vs densely pilose).

Calea triantha (Vell.) Pruski
Figs 2D, 4, 10A, C, E

Calea triantha (Vell.) Pruski (Pruski 2005: 2027). – *Aster trianthus* Vell. (Vellozo 1831: t. 120). – *Meyeria triantha* (Vell.) Pruski (Pruski 2023: 101).

Meyeria hispida DC. (Candolle 1836: 671). – *Calea hispida* (DC.) Baker (Baker 1884: 261). – **Type**: BRAZIL – **São Paulo** • between Mogi das Cruzes and São Paulo; Nov. 1833; *P. Lund 866*; V.R. Bueno det. 2023; lectotype: G [00456737], designated by Pruski 2005; isolectotypes: C [10007027], S [S-R-3508].

Type material

BRAZIL – **São Paulo** • Cunha; 1827; fl., fr.; *J. Velloso s.n.*; lectotype: Vellozo 1831: t. 120 [photo!], designated by Pruski 2005.

Selected material examined

BRAZIL – **Minas Gerais** • Poços de Caldas, Campo do Saco; 12 Feb. 1965; fl., fr.; *M. Emmerich 2381*; V.R. Bueno det. 2023; RB [RB00395895]. – **Paraná** • Campo Largo, fazenda Thalia; 8 Mar. 1998; fl., fr.; *W. Amaral 22*; V.R. Bueno det. 2023; MBM [384546]. – **Santa Catarina** • Lages, salto Caveira; 29 Jan.

2015; fl., fr.; *R. Mello-Silva 3765*; V.R. Bueno det. 2023; ICN [203081], SP [474024], SPF [217565] • Campos do Jordão, vale do rio Coxim, areal; 17 Mar. 1964; fl., fr.; *J. Correa Gomes Jr. 1620*; V.R. Bueno det. 2023; SP [77748], UB [5499].

Description

Shrubs 0.4–2 m tall. Stems cylindrical, striate, usually hispid, sometimes sparsely or densely hispid, non-glandular, castaneous, internodes 7.4–36.5(–40.2) mm long. Leaves decussate, petiole 0.7–2.3(–4.45) mm long; blades 0.7–2.93(–3–3.44) × 0.66–2.85(–3.02) cm, generally very widely ovate, often widely ovate, coriaceous, generally slightly discolorous, sometimes concolorous, green, base cordate, apex commonly obtuse, venation acrodromous basal, secondary veins conspicuous; margins revolute, thin, green, commonly oligoserrate, sometimes pauciserrate or multiserrate, rarely entire, 1–12(–15) teeth, 0.4–3.7 mm long, usually from the base to middle, often along the margins, rarely just in middle; surface abaxial generally hispid, rarely densely hispid or hispidulous, veins hispidulous to hispid, densely glandular-punctate or glandular-punctate, surface adaxial glabrous to scabrid or scabrid, non-glandular. Capitulescence cymose dichasiform, profusely branched or branched, axis 1.2–45.7(–47.5) mm long, branching to 2–4(–5) ramification orders, 4–26(–32) secondary stems; peduncle 0.2–4.81(–6.3) cm long, usually hispid or hispidulous, rarely puberulous, non-glandular. Capitulum radiate, heterogamous, involucre 7.1–12.7 × (5.1–)8.1–15 mm, commonly campanulate, often hemispherical, sometimes cylindrical. Phyllaries 5-seriate, margins thin, conspicuously striate; outermost series foliaceous, green, 4–6-striate; first series of phyllaries 5.5–7.7 × 3.5–5.8 mm, generally shorter, rarely longer than involucre, generally longer than second series, sometimes equal or shorter, commonly ovate, sometimes very widely ovate or widely elliptic, rarely elliptic, apex obtuse, margin entire, revolute or apex revolute, usually hispidulous, sometimes hispidulous to glabrescent, rarely scabrid, glandular–punctate or non-glandular; second series 5.1–7.8 × (2.1–)3–5.5 mm, commonly oblanceolate, sometimes suborbiculate or widely ovate or elliptic, apex generally obtuse, rarely rounded, margin entire, apex revolute, generally hispidulous, sometimes glabrescent, glandular punctate or non-glandular; third series 5.1–7.9 × (2.3–)3.2–4.5 mm, ovate to oblong, apex rounded or obtuse, margin entire, flat, glabrous or sparsely hispidulous, non-glandular, scarious or scarious with apex foliaceous, yellowish green to yellow or yellowish green to green, 8–10-striate; innermost series margin entire, glabrous, scarious, yellowish green to yellow, 10-12-striate; fourth series 6.5–8.5(–9.5) × 2.6–5 mm, generally oblong, rarely elliptic or oblanceolate, apex usually rounded, sometimes obtuse; fifth series 6.6–8.2(–9.3) × 1.8–3.1(–4.2) mm, oblong to oblanceolate, apex generally rounded, rarely obtuse. Receptacle convex, holopaleceous, paleae 5.9–8.9 × 1.2–1.8 mm, longer than corolla disc, oblong, apex long acuminate, conduplicate, yellow. Ray florets 6–13, pistillate, corolla liguliform, yellow, (7.7–)8–13.6(–15.6) mm long, tube 1.7–2.8 mm long, limb 6–13.2 × 2.6–6.7 mm, obovate or oblong, apex commonly rounded, rarely obtuse or 2-lobulate, five veins, surface abaxial glandular-punctate, surface adaxial glabrous, yellow; style branches 0.8–1.2, linear. Disc florets 25–50, monoclinous, corolla tubular, yellow, (4.3–)4.5–5.1(–6.5) mm long, tube 1.1–2.3 mm long, lobes 0.8–1.5 mm long, glabrous; anthers 2.1–2.8 mm long, yellow, anther appendages apically ovate; arms of style 1–1.2 mm long, linear, yellow. Cypselae 2–3.5 mm long, prismatic or obconic, nigrescent, ray cypselae 3–angled, disc cypselae 4–angled, glabrous or glabrous to hirsute or glabrous to pilose, angles usually densely pilose, often hirsute, sometimes glabrous to pilose; pappus monotypic, monolength, free, scales 10–15, 0.7–1.4(–2) mm long, oblong to oblanceolate, apex obtuse, margin entire, apex erose.

Distribution, habitat and phenology

Calea triantha occurs in Brazil from the states of Santa Catarina, Paraná, São Paulo, and Minas Gerais (Fig. 4), mainly in grassland patches in the Atlantic Forest, but some specimens from southwest Minas Gerais grow in Cerrado habitats. This species can be considered the one with the widest range of distribution in the subgenus with 860 km in a straight line from the southernmost to the northernmost register. *Calea triantha* inhabits grasslands associated with rock outcrops, anthropic grasslands, and

rarely moist sites. It is found at elevations between 730–1420 m. *Calea triantha* was found flowering and fruiting throughout the year, but most specimens are collected from December to March.

Informal conservation status

Vulnerable (VU) B2ab(iii). *Calea triantha* has an AOO of 800 km² and an EOO of 363 227.899 km². As with other species in this study, the EOO of *C. triantha* encompasses extensive forest areas where the species does not occur, as well as coastal strips and marine areas, making the EOO value misleading. This species occurs throughout practically the entire distribution of the subgenus, except for Rio Grande do Sul, and therefore faces all the threats already discussed in this article. The populations are severely fragmented (B condition a), and there is a continuing decline inferred in habitat quality (B condition b). Thus, we propose that *C. triantha* should be considered Vulnerable.

Remarks

All four species of the *Calea triantha* group have been compared with each other previously. Therefore, here we will point out the differences between *C. triantha* with *C. parvifolia*, the parental species of *C.* × *parviantha* (Bueno *et al.* 2023a) and compare it with the hybrid.

Calea triantha can be distinguished from *C. parvifolia* by striate and non-glandular stems (vs corrugate and glandular-punctate), cordate base leaf (vs rounded), acrodromous venation leaf (vs reticulodromous venation), hispid or hispidulous abaxial surface leaf (vs generally glabrous, rarely puberulous); non-glandular peduncle (vs glandular-punctate), first series of phyllaries with obtuse apex (vs acute), third series of phyllaries 5.1–7.9 mm long (8.8–10.3 mm), ovate to oblong (vs narrowly obovate to obovate); ray florets tube 1.7–2.8 mm long (vs 3–4.3 mm), and disc florets corolla non-glandular (vs glandular-punctate).

Calea triantha can be differentiated from *C.* × *parviantha* by commonly very widely ovate, sometimes widely ovate, rarely ovate blade leaf (vs generally ovate or narrowly ovate, rarely widely ovate), cordate base leaf (vs generally rounded, sometimes subcordate), usually obtuse apex (vs generally acute apex, rarely obtuse); conduplicate pealeae (vs concave); pappus scales monotypic (vs commonly monotypic, often bitypic), and pappus scales 0.8–1.3 mm long (vs 1.1–2.7 mm).

Calea* × *malmeana V.R.Bueno & G.Heiden nothosp. nov.
urn:lsid:ipni.org:names:77372517-1
Fig. 5, 11

Diagnosis

Calea × *malmeana* nothosp. nov. is intermediate morphologically compared to the parents (*Calea marginata* and *C. parvifolia*), it is distinct from *C. marginata* by glandular-punctate stems, peduncle, and disc floret corolla (vs non-glandular) and reticulodromous venation leaf (vs acrodromous basal). It can be individualized from *C. parvifolia* by inconspicuous secondary venation leaf (vs conspicuous), white margin leaf and of outermost series of phyllaries (vs green).

Etymology

The epithet honors Gustaf Oskar Andersson Malme (1864–1937), a Swedish botanist who served as curator at the Museum of Natural History in Stockholm, and who made two important collecting expeditions through Brazil. In addition, he published over 120 names for Asteraceae (Tropicos 2025) and published a paper on *Calea* (Malme 1933), where he recorded the hybrid nature of some species, without formally describing them.

Fig. 11. Digitized image of the type of *Calea* × *malmeana* V.R.Bueno & G.Heiden nothosp. nov., *P.K.H. Dusén 9553a* (S [17-26715]).

Type material

Type

BRAZIL – **Paraná** • Ponta Grossa, Fortaleza, in subpaludosis; 26 Feb. 1910; fl., fr.; *P.K.H. Dusén 9553a*; V.R. Bueno det. 2023; holotype: S [17-26715].

Paratypes

BRAZIL – **Paraná** • Jaguariaíva, Lago Azul; 5 Mar. 2006; fl., fr.; *E. Barbosa* & *E.F. Costa 1293*; V.R. Bueno det. 2023; CESJ [48441], FURB [7023], MBM [318471] • Ponta Grossa, formador do Rio Tibagi, cruzamento BR-376; 31 Jan. 1999; fl., fr.; *S.R. Ziller et al. 1722*; V.R. Bueno det. 2023; EFC [8779], MBM [242494] • Palmeira, Rio dos Papagaios; 7 May 1981; fl., fr.; *L.T. Dombrowski et al. 12761*; V.R. Bueno det. 2023; MBM [300633].

Description

Shrubs 0.5–1.5 m tall. Stems cylindrical, corrugate, glabrous to densely scabridulous or sparsely hispidulous, densely glandular-punctate or glandular-punctate, castaneous, internodes 10.9–27.6(–34.4) mm long. Leaves decussate, petiole 0,9–2.3 mm long; blades 1.3–3.97 × 0.4–1.1 cm, commonly lanceolate, often narrowly elliptic to narrowly oblong, chartaceous, generally concolorous, often slightly discolorous, usually green, often surface adaxial dark green, base generally obtuse, rarely rounded, apex acute or obtuse, venation reticulodromous, secondary veins inconspicuous; margins generally slightly revolute or revolute, sometimes flat, entire, generally thin, rarely thickened, white; abaxial surface densely punctate, surface adaxial generally glabrous, rarely sparsely strigose. Capitulum usually solitary, rarely capitulescence cymose dichasiform, slightly branched, axis 0–2.74 mm long, branching to 2nd ramification order, 2–4 secondary stems; peduncle 0.8–4.1 cm long, sparsely hispidulous to hispidulous or hispid to densely hispid, sparsely glandular-punctate or densely glandular-punctate. Capitulum heterogamous, radiate; involucre 8.3–13 × 11.1–15.1 mm, campanulate or hemispherical. Phyllaries 5-seriate; outermost series of phyllaries apex obtuse, margins apex slightly revolute, generally entire, rarely pauciserrate, white, usually inconspicuously striate, sometimes conspicuously; first series 10.5–12.3 × 3–4.8(–6.6) mm, commonly longer than involucre, often shorter, longer than second series, generally narrowly elliptic, sometimes panduriform or obovate, usually sparsely glandular-punctate, sometimes glandular-punctate, rarely glandular-foveate, foliaceous, green, 2–4-striate; second series 9.8–11.5 × 3.8–4.8(–6.5) mm, generally narrowly elliptic or panduriform, sometimes obovate, margins rarely flat, usually sparsely glandular-punctate, rarely glandular-foveate, middle foliaceous, greenish yellow to green, 4–8-striate; third series 9–10.3 × 5–5.8 mm, generally widely oblong to oblong, rarely ovate, apex obtuse, margins entire or pauciserrate, green, apex slightly generally revolute or revolute, rarely flat, apex sparsely glandular-punctate, middle foliaceous, greenish yellow to green, 6–10-striate, generally inconspicuously striate, sometimes conspicuously; innermost series of phyllaries apex rounded, margins entire, thin, flat, apex erose, sparsely glandular-punctate, conspicuously striate; fourth series 9.4–10.5 × 5.3–7.1 mm, oblong to obovate, apex acuminate, generally scarious, sometimes apex foliaceous, usually greenish yellow to yellow, sometimes apex green, 10–15-striate; fifty series 9.8–11.5 × 3.5–4.8 mm, oblong to oblanceolate, scarious, greenish yellow to yellow, 10–12-striate. Receptacle slightly convex, holopaleaceous, paleae 7.8–9.1 × 1–2.2 mm long, longer than corolla disc, narrowly oblanceolate or narrowly elliptic, apex long acuminate, concave or conduplicate, light yellow. Ray florets 12–15, pistillate, corolla 15–20.5(–22.3) mm long, liguliform, yellow, tube 3.1–4.3 mm long, limb 11.8–18.5 × 2.4–4.9 mm, generally narrowly oblong, often oblanceolate, apex generally 2–4-lobulate, often obtuse or rounded, 5–6-veined, abaxial surface densely glandular-punctate, adaxial surface glabrous; style branches 0.9–1.6 mm long, linear, yellow. Disc florets 30–50, monoclinous, corolla tubular, yellow, 5–7.1 mm long, tubular, tube 1.5–2.3 mm long, lobes 0.9–1.6 mm long, sparsely glandular-punctate to densely glandular-punctate; anthers 2.7–3.2 mm long, light yellow, anther appendages apically ovate; style branches 0.8–1.4 mm long, linear, yellow. Cypselae 3.3–3.9 mm long, prismatic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, generally glabrous

to pilose, sometimes glabrous or pilose, ribs usually pilose to densely pilose, sometimes densely hirsute; pappus bitypic, monolength and bilength, free, scales 8–15 (1–3 distinctly longer), mostly 0.6–1.6 mm long, longer 0.9–2.2 mm long, oblanceolate or oblong, longer elliptic, apex commonly obtuse or rounded, sometimes acuminate, margins entire, apex erose.

Distribution, habitat and phenology

This natural hybrid was only collected five times in Paraná (Fig. 5), being the taxon with the lowest number of records of *Calea* subg. *Meyeria*. This nothospecies grows in Atlantic Forest grasslands in riverine vegetation, but not in moist sites. *Calea* × *malmeana* nothosp. nov. flowers and fruits from January to May.

Informal conservation status

Critically Endangered (CR) B2ab(iii); C; D. While hybrids are typically not evaluated for conservation status, this nothospecies has been documented over a 100-year period, suggesting it represents a recurrent or stable hybrid taxon. The species has an EOO of 824 km² and an AOO of 16 km². Due to its hybrid nature, conservation of this nothospecies requires protection of both the hybrid individuals and their parent species populations, compounding the conservation challenges. The populations are severely fragmented (B condition a), and there is a continuing decline inferred in habitat quality (B condition b), with threats similar to those affecting other grassland species in the region. In the most recent record of nothospecies in nature, botanists estimate having seen fewer than 50 mature individuals (R.T. Dall'Agnol, pers. com.). Thus, we propose that this nothospecies should be considered Critically Endangered.

Remarks

Malme (1933) was the first to record the hybrid nature of *Calea* × *malmeana* nothosp. nov., but as previously mentioned, he did not formally describe it. We studied the specimens suggested by Malme (1933), as well as others that we added here and concluded that these specimens are indeed from a nothospecies that co-occurs with its parental species. This new nothospecies can be differentiated from the parental species by different characters that will be explained below.

This nothospecies is distinct from *C. marginata* by glandular-punctate stems and peduncle (vs non-glandular), reticulodromous venation leaf (vs acrodromous basal); first series of phyllaries with obtuse apex (vs rounded or truncate); disc floret corolla glandular-punctate (vs glabrous), and commonly longer cypselae 3.3–3.9 mm long (2.3–3.4 mm).

Calea × *malmeana* nothosp. nov. can be distinguished from *C. parvifolia* by inconspicuous secondary venation leaf (vs conspicuous), white margin leaf and of outermost series of phyllaries (vs green); first series of phyllaries with obtuse apex (vs acute), and slightly revolute apex (vs flat).

Calea* × *parviantha V.R.Bueno & G.Heiden.
Figs 2E, 5, 8B, D, F

Calea × *parviantha* V.R.Bueno & G.Heiden (Bueno & Heiden 2023: 149).

Type material

BRAZIL – **Paraná** • Jaguariaíva, campo próximo à ponte do Rio das Mortes, PR-151; 16 Dec. 1991; fl., fr.; *A.C. Cervi et al. 3546*; V.R. Bueno det. 2023; holotype: MBM [161398]; isotypes: CGMS [44616], CPAP [10996], UPCB [33501].

Selected material examined

BRAZIL – **Paraná** • Balsa nova, Ponte dos Arcos; 7 Dec. 2005; fl., fr.; *C. Kozera 2688*; V.R. Bueno det. 2023; MBM [335464] • Jaguariaíva, campo próximo à ponte do Rio das Mortes - PR 151; 16 Dec. 1991; fl., fr.; *A.C. Cervi et al. 3546*; V.R. Bueno det. 2023; CGMS [44616], MBM [161398], UPCB [33501] • Tibagi, Parque Estadual Canyon Guartelá; 10 Feb. 1997; *V.F. Kinupp et al. 273*; V.R. Bueno det. 2023; FUEL [28973], HUPG [10062] • São Paulo, Itapeva, Estação Ecológica de Itapeva; 18 Aug. 1995; fl., fr.; *V.C. Souza et al. 8732*; V.R. Bueno det. 2023; SP [287786] • Itararé, Gruta da Barreira; 4 Dec. 1984; fl., fr.; *C. Muller et al. 5994*; V.R. Bueno det. 2023; FUEL [5994].

Description

Shrubs 0.2–1.2 m tall. Stems cylindrical, striate, generally hispid, often sparsely hispid, rarely densely hispid or hispidulous to hispid or glabrous, generally non-glandular, rarely glandular-punctate, castaneous, internodes 5.4–32.7 mm long. Leaves decussate, petiole 0.5–2.2 mm long; blades 0.78–2.57 × 0.42–1.59 cm, generally ovate or narrowly ovate, rarely widely ovate, coriaceous, usually concolorous, sometimes slightly discolorous or discolorous, commonly green, sometimes surface abaxial dark green, base usually rounded, sometimes subcordate, apex generally acute, rarely obtuse, venation generally acrodromous basal with reticulate secondaries or acrodromous basal, rarely acrodromous suprabasal, secondary veins conspicuous; margins commonly revolute, often slightly revolute, generally pauciserrate, often entire, sometimes oligoserrate, rarely multiserrate, 1–12(–14) teeth, 0.1–1.3(–2) mm long, usually distributed from the base to middle, sometimes absent or just in the middle, rarely along the margins; abaxial surface generally hispidulous, often glabrous, sometimes hispid, veins usually hispid to hispidulous or hispidulous, sometimes without tector trichomes, generally densely glandular-punctate, often glandular-punctate, adaxial generally surface scabridulous, often sparsely scabridulous with margin scabridulous, sometimes glabrous to scabridulous, non-glandular. Capitulescence generally cymose dichasiform, sometimes capitula solitary, profusely branched or branched, axis 0–14.56(–30.3) cm long, branching to 2nd–3rd ramifications, rarely 4–5 ramification orders, 2–14(–18) secondary stems, peduncle 0.1–3.55(–4.15) cm long, hispid, usually non-glandular, rarely glandular-punctate. Capitulum heterogamous, radiate, involucrum 5.8–9.7 × 6.8–13.6 mm, generally campanulate, sometimes hemispherical. Phyllaries 5-seriate, margins thin; outermost series of phyllaries margins usually entire, sometimes pauciserrate, generally hispid to hispidulous, sometimes glabrous or hispidulous, densely glandular-punctate or glandular-punctate, commonly foliaceous, sometimes foliaceous with base scarious, generally green, sometimes green with base yellowish green, conspicuously or inconspicuously striate; first series 6.6–10.2 × (3–)3.9–4.7(–5.7) mm, generally longer than involucre, often shorter, longer or equal or shorter than second series, generally widely elliptic or narrowly obovate, sometimes elliptic, rarely oblanceolate, apex acute or obtuse, usually middle revolute, often revolute, 4–6-striate; second series 7–10.4 × 3.1–5.7(–7.5) mm, obovate or widely elliptic or panduriform, apex generally obtuse, often acute, apex revolute, rarely middle revolute, 4–8-striate; third series 5.5–9.7 × 2.7–4.8 mm, generally oblong or narrowly ovate, sometimes narrowly obovate, apex commonly obtuse, sometimes rounded, rarely acuminate, margins entire, apex revolute or flat, apex generally sparsely hispid or pilose, sometimes without tector trichomes, apex usually densely glandular-punctate, often apex glandular-punctate, rarely glandular-punctate, commonly scarious with apex foliaceous, sometimes scarious, yellowish green to green or yellowish green, conspicuously or inconspicuously striate, 6–10-striate; innermost series generally glabrous, sometimes apex glandular-punctate, scarious, yellowish green to light yellow, conspicuously striate; fourth series 7.2–9.9 × 3.5–4.7 mm, generally oblong, sometimes narrowly obovate, apex rounded, margins generally entire, sometimes apex erose, 10–15-striate; fifth series 7.4–10.9 × 2.3–3.9 mm, usually narrowly oblong or oblanceolate, sometimes narrowly elliptic, apex commonly rounded, sometimes obtuse, margins entire, 8–12-striate. Receptacle slightly convex, holopaleaceous, paleae 7–9 mm long, generally longer than disc corolla, rarely equal, generally narrowly elliptic or narrowly oblong, sometimes narrowly oblanceolate, apex long acuminate, concave, light yellow. Ray florets 8–15, pistillate, corolla

liguliform, yellow, (8.3–)9.3–14.2(–16.4) mm long, tube 1.5–3.8 mm long, limb 5.9–12.6 × (1.8–)3.2–4.6 mm, generally narrowly obovate, often narrowly elliptic to elliptic or narrowly oblong or oblanceolate, apex generally rounded, sometimes 2–4 lobulate, rarely obtuse, 5–7 veins, surface abaxial generally densely glandular-punctate, sometimes glandular-punctate, surface adaxial glabrous; style branches 0.7–1.5 mm long, linear, yellow. Disc florets 30–55, monoclinous, corolla tubular, yellow, 4.4–7 mm long, tube 1.3–2.6 mm long, lobes 1–1.7(–2.1) mm long, usually sparsely glandular-punctate or glabrous, rarely glandular-punctate; anthers (2.3–)2.5–2.9 mm long, light yellow, anther appendages apically ovate; style branches 0.8–1.2 mm long, linear, yellow. Cypselae 2.2–3.2(–3.6) mm long, prismatic, nigrescent, ray cypselae 3-angled, disc cypselae 4-angled, glabrous to pilose or sparsely pilose to densely pilose, ribs commonly densely pilose, often pilose; pappus generally monotypic, often bitypic, usually monolength, often monolength and bilength, free, scales 8–15 (1–2 distinctly longer, when present), mostly 1.1–2.2 mm long, longer scales 1.6–3 mm long (when present), generally oblong or oblanceolate, sometimes narrowly elliptic, apex obtuse or rounded, margins entire, apex erose.

Distribution, habitat and phenology

Calea × *parviantha* occurs in Brazil in the states of São Paulo and Paraná (Fig. 5) in the Atlantic Forest grasslands with rock outcrops and riverine vegetation. In the Jaguariaíva sites, *C.* × *parviantha* is more commonly found than its parental taxa, suggesting that hybrid populations are probably replacing them in this area. This taxon occurs at elevations between 640–750 m. Most of the collected specimens were found flowering and fruiting from December to April, with one outlier record flowering in August.

Informal conservation status

Endangered (EN) B2ab(i,ii,iii). While hybrids are traditionally not evaluated for conservation status, this nothospecies has been documented in collections spanning almost a century, suggesting it represents a stable hybrid taxon warranting conservation assessment. The nothospecies has an EOO of 5000 km² and an AOO of 48 km². The two hybrids discussed here (*C.* × *parviantha* and *C.* × *malmeana* nothosp. nov.) occur in the APAED and are subject to the threats discussed by Harfouche *et al.* (2019), such as conversion of grasslands to pasture. This leads to severely fragmented environments (B condition a) and a continuous decline in extent of occurrence and area of occupancy (B condition b). Furthermore, the nothospecies mostly occurs out of protected areas, except for three occurrences in Estação Ecológica de Itapeva, Parque Ecológico de Itapeva and Parque Ecológico da Barreira.

Remarks

In the previous taxonomic note, *C.* × *parviantha* was compared to one of its parents: *C. triantha*.

Calea × *parviantha* is different from *C. parvifolia* by striate stems (vs furrowed stems), hispid or hispidulous or glabrous stems (vs puberulous or puberulent), non-glandular in stems, rarely glandular-punctate (vs generally densely glandular-punctate, sometimes glandular-punctate), coriaceous leaves (vs chartaceous), generally revolute margin, sometimes slightly revolute (vs flat), commonly hispidulous abaxial surface leaf (vs commonly glabrous); second series of phyllaries with revolute apex (vs flat), and third series of phyllaries with entire margin (vs generally pauciserrate, rarely entire).

In comparison with *Calea* × *malmeana* nothosp. nov., *C.* × *parviantha* can be individualized by striate stems (vs corrugate stems), venation secondary conspicuous (vs inconspicuously), green leaf margin (vs white); outermost series of phyllaries with green margin (vs white), first series 6.6–10.2 mm long (vs 10.5–12.3 mm), fourth series 3.5–4.7 mm widely (vs 5.3–7.1 mm), and usually longer cypselae 2.2–3.2 mm long (vs 3.3–3.9 mm).

Discussion

Calea subg. *Meyeria* comprises eight species (*C. funkiana*, *C. marginata*, *C. myrtifolia*, *C. parvifolia*, *C. phyllolepis*, *C. pruskiana*, *C. subintegerrima*, *C. triantha*) and two nothospecies (*C.* × *malmeana* nothosp. nov. and *C.* × *parviantha*), representing 5% of all *Calea* taxa. These eight species were evaluated palynotaxonomically by Cartaxo-Pinto *et al.* (2023), who provided detailed information on palynological characters for all species—an unprecedented study for *Calea*. Despite general similarity among species, the palynological characters were sufficient to separate all species, thus contributing to a better taxonomic distinction between species, and reinforcing the conclusion that these species are well defined.

This subgenus includes two morphological species complexes with relatively uniform morphology, although they are not reciprocally monophyletic. The '*Calea myrtifolia* group' is paraphyletic (Bueno *et al.* 2025e) and includes *C. marginata*, *C. myrtifolia*, *C. parvifolia*, and *C. phyllolepis*. These species generally have narrower ovate leaves, abaxial surface without tector trichomes, leaf margin pauciserrate or entire, and few branched capitulescence. The '*Calea triantha* group' is also paraphyletic, it includes *C. funkiana*, *C. pruskiana*, *C. subintegerrima*, and *C. triantha*. This group can be characterized by the broader ovate leaves, abaxial leaf surface with abundant tector trichomes (except for *C. subintegerrima*) oligoserrate leaf margins, and several branched capitulescence. According to Pruski (2023), the species in the *Calea triantha* complex are (very) narrowly defined, however our study shows that the species are separated by several characters, further supported by palynological traits (Cartaxo-Pinto *et al.* 2023).

Meyeria was first described by Candolle (1836) and subdivided into two subgenera: *Meyeria* subg. *Holophyllaea* DC. including *M. longifolia* DC. (now *C. marginata*), *M. myrtifolia* DC. (now *C. myrtifolia*), and *M. parvifolia* DC. (now *C. parvifolia*); and *M.* subg. *Gluphiphyllaea* DC. containing only *M. hispida* DC. (*C. triantha*). Because these subdivisions are not reciprocally monophyletic, we do not accept them formally, but they remain useful for identification. A broader taxonomic sampling and additional molecular markers are a priority for future phylogenetic studies to elucidate relationships at shallower phylogenetic scales.

Conclusions

This is the second taxonomic revision for *Calea* with phylogenetic support (Bueno 2023), focused on subg. *Meyeria*. The first study provided a circumscription for the subgenus (Bueno 2023); the present one expands upon it. The treatment is based on more than 1300 specimens examined and 115 specimens measured in detail, yielding a diagnosis for the subgenus, description for each species, and specific information about the geographic distribution, conservation status, phenology, and taxonomic notes.

Calea subg. *Meyeria* comprises 10 taxa occurring from Minas Gerais to Rio Grande do Sul states of South and Southeast Brazil (Figs 1, 4–5, 7, 9). Future phylogenetic studies including species that have not yet been sampled will make it possible to better understand this subgenus, its biogeography and its character evolution. Nevertheless, the present work represents an important step forward by performing a detailed revision of an infrageneric group of *Calea* after classification based on a phylogenetic hypothesis.

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References

Andrade B.O., Bonilha C.L., Ferreira P.M.A., Boldrini I.I. & Overbeck G.E. 2016. Highland grasslands at the southern tip of the Atlantic Forest Biome: Management options and conservation challenges. *Oecologia Australis* 20: 37–61. https://doi.org/10.4257/oeco.2016.2002.04

Bachman S., Moat J., Hill A.W., Torre J. & Scott B. 2011. Supporting Red List threat assessments with GeoCAT: Geospatial conservation assessment tool. *ZooKeys* 150: 117–126. https://doi.org/10.3897/zookeys.150.2109

Baker J.G. 1884. Compositae: Helianthoideae. *In*: Martius C.F.P. & von Eichler A.W. (eds) *Flora Brasiliensis, Vol. 6*: 251–258. Oldenbourgh, München & Leipzig.

Barroso G.M. 1975. De compositarum novitatibus. *Sellowia* 26: 102–118.

Beentje H. 2016. *The Kew Plant Glossary: An Illustrated Dictionary of Plant Terms*. Kew Publishing, Richmond.

Bentham G. & Hooker J.D. 1873. *Genera Plantarum*. Reeve & Co, London.

Blake S.F. 1937. Eleven new Asteraceae from North and South America. *Journal of the Washington Academy of Sciences* 27: 347–391.

Bond W.J. & Parr C.L. 2010. Beyond the forest edge: Ecology, diversity and conservation of the grassy biomes. *Biological Conservation* 143 (10): 2395–2404. https://doi.org/10.1016/j.biocon.2009.12.012

Brown R. 1818. Mr. Brown's observation on the natural family of plants called Compositae. *The Transactions of the Linnean Society of London* 12 (1): 76–142. https://doi.org/10.1111/j.1095-8339.1817.tb00223.x

Bueno V.R. 2023. *Neurolaeneae Systematics*. PhD thesis, Universidade Federal do Rio Grande do Sul, Brazil.

Bueno V.R. & Heiden G. 2021. *Calea funkiana* (Compositae, Neurolaeneae), A new endemic species from Serra do Cipó, Minas Gerais, Brazil. *Systematic Botany* 46: 470–475. https://doi.org/10.1600/036364421X16231782047497

Bueno V.R. & Heiden G. 2022a. Novelties in *Calea* sect. *Meyeria* (Asteraceae, Neurolaeneae) from Brazil. *Systematic Botany* 47 (2): 575–585. https://doi.org/10.1600/036364422X16512564801632

Bueno V.R. & Heiden G. 2022b. *Calea sessilifolia* (Asteraceae, Neurolaeneae), a new species from the Diamantina Plateau, Minas Gerais, Brazil. *Systematic Botany* 47 (2): 586–592. https://doi.org/10.1600/036364422X16512564801687

Bueno V.R., Gostel M.R. & Heiden G. 2021. An overview of Neurolaeneae (Compositae). *Capitulum* 1: 36–43.

Bueno V.R., Gostel M.R. & Heiden G. 2022. *Calea repanda* (Asteraceae: Neurolaeneae), a new species and novel characters for the taxonomy of the genus. *Phytotaxa* 544 (3): 280–288. https://doi.org/10.11646/phytotaxa.544.3.2

Bueno V.R., Cassol A.P.V., Leroy C.J., Bueno M.L. & Heiden G. 2023a. Two noteworthy *Calea* (Asteraceae: Neurolaeneae) from contact areas of the Atlantic Forest and Cerrado of Brazil. *Phytotaxa* 579 (3): 143–695. https://doi.org/10.11646/phytotaxa.579.3.1

Bueno V.R., Cassol A.P.V., Leroy C.J., Bueno M.L. & Heiden G. 2023b. *Calea* × *crassa* (Neurolaeneae: Asteraceae), a new nothospecies from Paraná state, Brazil. *Phytotaxa* 618: 133–148. https://doi.org/10.11646/phytotaxa.618.2.3

Bueno V.R., Gostel M.R. & Heiden G. 2023c. The spiraling story of *Tyleropappus* and a new name for *Calea* (Asteraceae: Neurolaeneae) from Venezuela. *Phytotaxa* 622: 1–24. https://doi.org/10.11646/phytotaxa.622.1.5

Bueno V.R., Silva G.H.L., Reis-Silva G.A., Teles A.M., Nakajima J.N., Gostel M.R. & Heiden G. 2024a. Synopsis of *Calea* subg. *Teucriifoliae* (Asteraceae: Neurolaeneae), a new subgenus endemic to the Cerrado. *Phytotaxa* 637 (1): 62–72. https://doi.org/10.11646/phytotaxa.637.1.4

Bueno V.R., Silva G.H.L., Reis-Silva G.A., Teles A.M., Nakajima J.N., Gostel M.R. & Heiden G. 2024b. Nomenclatural synopsis of the new *Calea* ser. *Candolleanae* (Asteraceae: Neurolaeneae), a clade endemic to Eastern and Central Brazil. *Phytotaxa* 660 (1): 46–54. https://doi.org/10.11646/phytotaxa.660.1.4

Bueno V.R., Ramos R., Almeida M.L.C., Hemetrio N.S. Santos F.R., Prado J. & Zavatin D.A. 2025a. Novelties for *Wedelia* (Asteraceae, Heliantheae) in Minas Gerais, Brazil: a new species and a rediscovery after over 70 years. *Phytotaxa* 722 (1): 1–15. https://doi.org/10.11646/phytotaxa.722.1.1

Bueno V.R., Reis-Silva G.A., Nakajima J.N., Gostel M.R. & Heiden G. 2025b. A new narrower circumscription and a nomenclatural synopsis for *Calea* subg. *Meyeria* (Asteraceae: Neurolaeneae). *Phytotaxa* 683 (3): 273–280. https://doi.org/10.11646/phytotaxa.683.3.8

Bueno V.R., Almeida M.L.C., Fernandes M.G.C., Ferreira Jr. C.A., Prata-Silveira A. & Bentes M.S. 2025c. Small collections, great findings: three new species and two new state records for Asteraceae from Brazil. *Nordic Journal of Botany* e04846. https://doi.org/10.1002/njb.04846

Bueno V.R., Bentes M.S., Ramos R., Zavatin D.A. & Prata-Silveira A. 2025d. Three new species of *Calea* (Asteraceae, Neurolaeneae) from the sky islands of the Espinhaço Range. *Phytotaxa* 689 (2): 185–203. https://doi.org/10.11646/phytotaxa.689.2.2

Bueno V.R., Gostel M.R., Reis-Silva G.A., Nakajima J.N. & Heiden G. 2025e. A novel circumscription and classification for Neurolaeneae (Asteraceae). *Taxon* 00: 1–41. https://doi.org/10.1002/tax.70061

Bueno V.R., Roque N., Reis-Silva G.A. & Heiden G. 2025f. Two new species of *Calea* (Asteraceae: Neurolaeneae) from Bahia, Brazil. *Phytotaxa* 730 (2): 149–162. https://doi.org/10.11646/phytotaxa.730.2.3

Bueno V.R., Martins M.A., Araújo H.H. & Pereira J.D. 2025g. What about the striate phyllaries in *Calea* (Asteraceae: Neurolaeneae)? Anatomical analyzes and the implication of the genus taxonomy. *Acta Botanica Brasilica* 39: e20250032. https://doi.org/10.1590/1677-941X-ABB-2025-0032

Candolle A.P. de 1836. Compositae-Senecioneae. *In*: Candolle A.P. (ed.) *Prodromus Systematis Naturalis Regni Vegetabilis, Vol. 5*: 497–695. Treuttel and Würtz, Paris and Strasbourg.

Cartaxo-Pinto S., Vieira I.F.T., Nascimento J.M., Bueno V.R., Heiden G., Mendonça C.B.F. & Gonçalves-Esteves V. 2023. *Palynology* 47 (4): 1–8. https://doi.org/10.1080/01916122.2023.2242449

C.V. Starr Virtual Herbarium 2025. New York Botanical Garden. Available from https://sweetgum.nybg.org/science/vh/ [accessed 15 Feb. 2025].

Díaz-Piedrahita S. & Rodríguez-Cabeza B.V. 2012. Novedades en asteráceas colombianas – II. *Revista Académica Colombiana de Ciéncias* 36: 501–515.

Ellis B., Daly D.C., Hickey L.J., Johnson K.R., Mitchell J.D., Wilf P. & Wing S.L. 2009. *Manual of Leaf Architecture*. The New York Botanical Garden Press, New York. https://doi.org/10.1079/9781845935849.0000

Flora e Funga do Brasil. Jardim Botânico do Rio de Janeiro. Available from http://floradobrasil.jbrj.gov.br/ [accessed 13 Nov. 2025].

Funk V.A., Susanna A., Stuessy T.F. & R. J. Bayer. 2009. *Systematics, Evolution and Biogeography of Compositae*. International Association for Plant Taxonomy, Vienna.

Gardner R. 1848. Contributions towards a Flora of Brazil, being the distinctive characters of some new species of Compositae, belonging to the tribe Senecionideae. *London Journal of Botany* 7: 395–425.

Harfouche T.B., Corte A.P.D., Ruza M.S. & Rex F.E. 2019. Dinâmica do uso do solo na APA da Escarpa Devoniana e seu entorno. *Enciclopédia Biosfera* 16 (29): 702–715. https://doi.org/10.18677/EnciBio_2019A55

Hickey L.J. 1973. Classification of the architecture of dicotyledonous leaves. *American Journal of Botany* 60: 17–33. https://doi.org/10.1002/j.1537-2197.1973.tb10192.x

JSTOR Global Plants 2025. ITHAKA. Available from https://plants.jstor.org/ [accessed 15 Feb. 2025].

IUCN 2024. Guidelines for using the IUCN red list categories and criteria, version 16. Available from https://www.iucnredlist.org/documents/RedListGuidelines.pdf [accessed 15 Feb. 2025].

Linnaeus C. 1763. *Species Plantarum, 2. Ed., Vol. 2*. L. Salvius, Stockholm.

Malme G.O.A. 1933. Compositae paranenses. *Kongliga Svenska Vetenskaps Academiens Handlingar* 12: 1–122.

Melquíades I.M., Bueno V.R., Teles A.M. & Koch A.K. 2025. A new species and a distribution update of *Calea* (Asteraceae, Neurolaeneae) from Mato Grosso state, Brazil. *Nordic Journal of Botany*: e04684. https://doi.org/10.1111/njb.04684

Miola D.T.B., Ramos V.D.V. & Silveira F.A.O. 2021. A brief history of research in campo rupestre: identifying research priorities and revisiting the geographical distribution of an ancient, widespread Neotropical biome. *Biological Journal of the Linnean Society* 133 (2): 464–480.

https://doi.org/10.1093/biolinnean/blaa175

Panero J.L. 2007. Tribe Heliantheae Cass. *In*: Kadereit J.K. & Jeffrey C. (eds) *The Families and Genera of Vascular Plants, Vol. 8*: 440–447. Springer, Berlin.

Pereira C.C. & Fernandes G.W. 2022. Cerrado Rupestre is not Campo Rupestre: The unknown and threatened savannah on rocky outcrops. *Nature Conservation* 49: 131–136. https://doi.org/10.3897/natureconservation.49.89237

Pozo P. & Hind D.J.N. 2013. A new species of *Calea* sect. *Meyeria* (Compositae: Heliantheae: Neurolaeninae), *Calea woodii*, from Santa Cruz, Bolivia. *Kew Bulletin* 68: 511–515.

https://doi.org/10.1007/s12225-013-9463-z

Pruski J.F. 1984. *Calea brittoniana* and *Calea kristiniae*: Two new Compositae from Brazil. *Brittonia* 36: 98–103. https://doi.org/10.2307/2806617

Pruski J.F. 1997. *Calea* L. *In*: Steyermark J.A., Berry P.E. & Holst B.K. (eds) *Flora of the Venezuelan Guayana*, *Vol. 3*: 221–236. Missouri Botanical Garden, St. Louis.

Pruski J.F. 1998. Novelties in *Calea* (Compositae: Heliantheae) from South America. *Kew Bulletin* 53 (3): 683–693. https://doi.org/10.2307/4110487

Pruski J.F. 2005. Studies of Neotropical Compositae – I. Novelties in *Calea*, *Clibadium*, *Conyza*, *Llerasia*, and *Pluchea*. *SIDA* 21: 2023–2037.

Pruski J.F. 2011. Compositae of the Guayana Highland – XIV. Four new species of *Calea* (Neurolaeneae) from Tepui summits in Venezuela. *Phytoneuron* 2011–52: 1–9.

Pruski J.F. 2013. Studies of Neotropical Compositae – IX. Four new species of *Calea* (Neurolaeneae) from Bolivia, Brazil and Paraguay. *Phytoneuron* 2013–72: 1–4.

Pruski J.F. 2023. The new genera *Laceanthos*, *Podocalea*, *Tepuipappus*, the resurrected genera *Lemmatium*, *Meyeria*, *Tonalanthus* and other novelties in the *Calea* Alliance I. *Phytoneuron* 42: 1–171.

Pruski J.F. & Hind D.J.N. 1998. Two new species of *Calea* (Compositae: Heliantheae) from Serra do Grão Mogol and vicinity, Minas Gerais, Brazil. *Kew Bulletin* 53 (3): 695–701. https://doi.org/10.2307/4110488

Pruski J.F. & Robinson H. 2018. Asteraceae. *In*: Davidse G., Sanchez M.S., Knapp S. & Cabrera F.C. (eds) *Flora Mesoamericana, Vol. 5*: 1–608. Missouri Botanical Garden, Saint Louis. Available from https://legacy.tropicos.org/Reference/100003860?projectid=3&langid=66 [accessed 15 Feb. 2025].

Pruski J.F. & Urbatsch L.E. 1983. *Calea bucaramagensis* (Asteraceae), a new species from the Colombian Andes. *Systematic Botany* 8: 93–95. https://doi.org/10.2307/2418567

Pruski J.F. & Urbatsch L.E. 1987. *Calea dalyi* (Compositae: Heliantheae), a new species from the Serranıa de Santiago, Bolivia. *Brittonia* 39: 201–204. https://doi.org/10.2307/2807375

Pruski J.F. & Urbatsch L.E. 1988. Five new species of *Calea* (Compositae: Heliantheae) from Planaltine Brazil. *Brittonia* 40: 341–356. https://doi.org/10.2307/2807644

QGIS 2015. QGIS Geographic Information System, Open Source Geospatial Foundation Project. Available from https://qgis.org/ [accessed 15 Feb. 2025].

Reflora 2025. Reflora – Herbario Virtual. Available from https://floradobrasil.jbrj.gov.br/reflora/herbarioVirtual/ [accessed 15 Feb. 2025].

Reis-Silva G.A. 2019. *The Genus Calea L. (Neurolaeneae, Asteraceae) in Minas Gerais, Brazil.* Unpublished Ph.D. thesis, Universidade Federal de Viçosa, Brazil.

Reis-Silva G.A. & Nakajima J.N. 2020. A new species of *Calea* (Neurolaeneae, Asteraceae) from the Espinhaço Range, Minas Gerais, Brazil. *Phytotaxa* 432 (2): 199–205. https://doi.org/10.11646/phytotaxa.432.2.9

Reis-Silva G.A. & Nakajima J.N. 2021. A new species of *Calea* (Neurolaeneae, Asteraceae) from the Atlantic Forest, Minas Gerais, southeastern Brazil. *Phytotaxa* 494 (1): 129–136. https://doi.org/10.11646/phytotaxa.494.1.9

Remor D., Bringel J.B.A. Jr., Pastore J.F. 2024. The correct authorship of *Caleacte*, *Calea pinnatifida* and *C. urticifolia* (Compositae). *Phytotaxa* 637 (3): 296–299. https://doi.org/10.11646/phytotaxa.637.3.9

Ribeiro K.T., Nascimento J.S., Madeira J.A. & Ribeiro L.C. 2009. Aferição dos limites da Mata Atlântica na Serra do Cipó, MG, Brasil, visando maior compreensão e proteção de um mosaico vegetacional fortemente ameaçado. *Natureza & Conservação* 7: 30–49.

Robinson B.L. & Greenman, J.M. 1896. Revision of the Mexican and Central American species of the genus *Calea*. *Proceedings of the American Academy of Arts and Sciences* 32 (1): 20–30. https://doi.org/10.2307/20020653

Robinson H. 1975. Studies in the Heliantheae (Asteraceae). VI. Additions to the genus *Calea*. *Phytologia* 32: 426–430.

Robinson H. 1979. Studies in the Heliantheae (Asteraceae). XIX. Four new species of *Calea* from Brasil. *Phytologia* 44: 270–276.

Roque N. & Carvalho V.C. 2011. Estudos taxonômicos do gênero *Calea* (Asteraceae, Neurolaeneae) no estado da Bahia, Brasil. *Rodriguésia* 62 (3): 547–561. https://doi.org/10.1590/2175-7860201162308

Silva G.H.L. 2016. *Estudos Taxonômicos do Gênero Calea L. (Asteraceae: Neurolaeneae) na região Centro-Oeste do Brasil*. Unpublished Ph.D. thesis, Universidade Federal de Viçosa, Brazil.

Silva G.H.L. & Teles A.M. 2018. *Calea* (Asteraceae, Neurolaeneae) no estado de Goiás, Brasil. *Rodriguésia* 69 (4): 1851–1875. https://doi.org/10.1590/2175-7860201869422

Silva G.H.L. Bringel J.B. & Teles A.M. 2016. A new species of *Calea* (Asteraceae–Neurolaneae) from Goiás State, Brazil. *Phytotaxa* 265 (3): 279–284. https://doi.org/10.11646/phytotaxa.265.3.9

Silva M.S., Bueno V.R., Scatigna A.V. & Marinho L.C. 2025. *Calea breviflora* (Asteraceae): a new species endemic to white sand ecosystems of easternmost Amazon, Maranhão, Brazil. *Phytotaxa* 682 (1): 91–100. https://doi.org/10.11646/phytotaxa.682.1.6

Smithsonian National Museum of Natural History 2025. Collection NHMN. Available from https://collections.nmnh.si.edu/search/botany/ [accessed 15 Feb. 2025].

SpeciesLink 2025. SpeciesLink network. Available from https://specieslink.net/search/ [accessed 15 Feb. 2025].

Thiers B. 2025 [continuously updated]. *Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff*. New York Botanical Garden's Virtual Herbarium. Available from https://sweetgum.nybg.org/science/ih/ [accessed 15 Feb. 2025].

Tropicos.org 2025. Missouri Botanical Garden. Available from https://tropicos.org [accessed 15 Feb. 2025].

Urbatsch L.E., Zlotsky A. & Pruski J.F. 1986. Revision of *Calea* sect. *Lemmatium* (Asteraceae: Heliantheae) from Brazil. *Systematic Botany* 11 (4): 501–514. https://doi.org/10.2307/2419029

Vellozo J.M.C. 1827. *Florae Fluminensis Icones, Vol. 8*. Senefelder, Paris. https://doi.org/10.5962/bhl.title.890

Viana L.R., Fernandes G.W. & Silva C.A. 2005. 'Ecological road' threatens endemic Brazilian plant with extinction. *Plant Talk* 41: 15.

Wussow J.R., Urbatsch L.E. & Sullivan G.E. 1985. *Calea* (Asteraceae) in Mexico, Central America and Jamaica. *Systematic Botany* 10 (3): 241–267. https://doi.org/10.2307/2418590

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Appendix 1. List of accepted taxa and specimens examined

1. *Calea funkiana*

Damasio, L. 2006 (G, RB); Duarte, A.P. 4613 (HBR, RFA); Duarte, A.P. 7608 (RB, VIC); Duarte, A.P. 8801 (RB, S); Fernandes, A.C. 318 (BHCB); Gomes, C.G. 80 (SPF); Hatschbach, G. 35338 (MBM); Heringer, E.P. 51083 (RB); Joly, A.B. CFSC2241 (SP, UEC); King, R.M. 8434 (K, MO, UB, US); Leitão Filho, H.F. 21764 (RB, TEPB, UEC); Mayo, S. CFSC7026 (SP, SPSF, UEC); Pirani, J.R. 6283 (MBM, SPF); Vidal, J. 2-6240 (R); Vidal, J. 5 (R, RB); Vidal, J. 5-93 (R).

2. *Calea marginata*

Aba-Asseff, M.J. (HUPG); Anderson, s.n. (HUPG); Anghinoni, R. s.n. (HUPG); Barbosa, E. 475 (UFMG); Barbosa, E. 973 (FURB, MBM); Bassani, G. 7 (UPCB); Brade, A.C. 2268 (MBM); Brade, A.C. 9069 (MBM, RB); Caxambu, M.G. 957 (ECT); Cervi, A.C. 3606 (UPCB); Cervi, A.C. 31087 (FLOR, UPCB); Cordeiro, J. 2410 (FLOR, HAS, HUCS); Cordeiro, J. 5124 (MBM, RB, SP); Dombrowski, L.T. 495 (MBM); Dombrowski, L.T. 495 (MBM); Dombrowski, L.T. 2323 (MBM); Dombrowski, L.T. 495 (MBM); Dombrowski, L.T. 5438 (MBM, UPCB); Dombrowski, L.T. 6762 (MBM); Dombrowski, L.T. 7620 (MBM); Dombrowski, L.T. 10383 (MBM); Dombrowski, L.T. 1049 (MBM); Dombrowski, L.T. 10480 (MBM); Dombrowski, L.T. 12342 (MBM); Dombrowski, L.T. 14020 (MBM); Dombrowski, L.T. 14453 (MBM); Dunaiski Jr., A. 43210 (MBM); Dusen, P.K. 21003 (R); Dusen, P.K. 4004 (R); Dusen, P.K. 4248 (LY); Dusen, P.K. 41048 (K); Dusen, P.K. 9800 (US); Dusen, P.K. 10553 (R); Dusen, P.K. s.n. (G); Elias, S.I. 133 (ESA); Fanchin, C.P. (HUPG); Felitto, G. 466 (MBM); Fernandes, J.A. s.n. (HUPG); Ferreira, L.V.C. s.n. (HUPG); Ferreira, M.C.C. 45 (UEC); Foster, N.E. s.n. (HUPG); Gaudichaud-Beaupré, C. 407 (G); Gaudichaud-Beaupré, C. 4010 (RB); Gaudichaud-Beaupré, C. s.n. (P); Gonçalves, R. 58 (UPCB); Hatschbach, G. 3535 (HBR, MBM, RB); Hatschbach, G. 5268 (HBR, MBM, RB); Hatschbach, G. 5438 (MBM, UPCB); Hatschbach, G. 12358 (MBM, RB); Hatschbach, G. s.n. (UPCB); Hertel, R. 167 (FUEL, RB); Hoehne, W. 23448 (SP, US); Inajara, s.n. (HUPG); Krieger, L. 107810 (HUFU, MBM, RB); Lobo Jr., R.C. s.n. (FUEL, UEC); Lozano, E.D. 9100 (MBM, UEPG); Lozano, E.D. 2052 (MBM); Lozano, E.D. 294 (MBM); Lozano, E.D. 2200 (MBM); Lozano, E.D. 294 (MBM); Lozano, E.D. 2200 (MBM); Lozano, E.D. 2212 (MBM); Lozano, E.D. 23710 (MBM); Lozano, E.D. 2521 (MBM); Mack, R. s.n. (RB); Marinero, F. 2 (MBM); Maruyama, A. 98 (UEC); Mattos, A. s.n. (MBM); Melfi, F. s.n. (HUPG); Michele, s.n. (HUPG); Moretti, M.B. (HUPG); Moro, R.S. 6610 (HUPG); Moro, R.S. s.n. (HUPG); Moro, T.E. s.n. (HUPG); Motta, J.T. 4156 (MBM); Muller, F. 215 (P); Paula-Souza, J. 3748 (ESA); Presner, s.n. (HUPG); Reitz, R. 174102 (FLOR, NY, P); Ribeiro, C. 301 (ICN); Ribeiro, Jr, A.I. 1 (SP); Saint-Hillaire, A. 1300 (P); Saint-Hillaire, A. s.n. (P); Scaramuzza, C.A.M. 6610 (ESA, UEC, SP, SPF); Scaramuzza, C.A.M. 79 (ESA); Scaramuzza, C.A.M. s.n. (ESA); Schwacke, C.A.W. 2214 (R); Sellow, F. s.n. (K); Shepherd, G. 6143 (UEC); Silva, J.S. 1832 (ESA, K, MBM, PEL, SJRP); Silva, J.S. 5484 (MBM); Silva, J.S. 6223 (FURB, MBM); Smith, L.B. 14570 (FLOR, P); Smith, L.B. 14752 (US); Souza, L.A. 1210 (HUFU); Souza, L.A. 188 (HUFU); Souza, L.P. 154 (UPCB); Souza, V.C. 22610 (ESA, UEC); Souza, V.C. 2303 (ESA, UEC); Souza, V.C. 2430 (ESA, UEC); Souza, V.C. 38107 (BHCB, ESA, K, MBM, SP, SPF, UEC); Souza, V.C. 4658 (ESA, MBM, RB, SP, SPF, UEC); Souza, V.C. 6056 (ESA, UEC); Souza, V.C. 6246 (ESA, SP, SPF, UEC); Souza, V.C. 7386 (ESA, SP, SPF, UEC); Souza, V.C. 39024 (ESA); Souza, V.C. 32083 (ESA); Souza, V.C. 34133 (ESA, RB, SPF); Takeda, I.J.M. 35 (MBM); Takeda, I.J.M. 1024 (HUPG); Vidal, J. 3-3103 (R); Vidal, J. 3-408 (R); Ziller, S.R. 1635 (EFC, HUPG); Ziller, S.R. 1722 (EFC, MBM).

3. *Calea myrtifolia*

Alvaro, C.F. s.n. (BCHB); Anderson, W.R. 35567 (UB); Araújo, I.M. 96 (HUFU); Bacelar, M. 80 (PAMG); Barreto, H.L.M. 10754 (BHCB); Brade, A.C. 176410 (R, RB); Brade, A.C. 905108 (MBM, RB); Bueno, V.R. 98 (HUFU, ICN); Capanema, C. s.n. (R, RB); Carvalho, D.A. s.n. (ESAL); Claussen,

P. 48 (P); Claussen, P. 668 (BM, P); Claussen, P. 12610 (P); Claussen, P. s.n. (BM); Claussen, P. s.n. (K, P); Cordeiro, J. 4705 (MBM); Costa, F.N. 2086 (DIAM, HUFU); Duarte, A.P. 8734 (RB); Egles, W. 4701 (RB); Fernandes, A.C. 384 (BHCB); Ferreira, V.F. 3670 (RB); Figueiredo, s.n. (RFA); França, B.C. s.n. (ESAL); Fukuda, L.A. s.n. (ESAL); Gavilanes, M.L. 1861 (PAMG); Gavilanes, M.L. 909 (ESAL); Gavilanes, M.L. 210001 (PAMG); Glaziou, A. 9154 (K); Glaziou, A. 16163 (G, P); Gonzaga, D. R. 946 (RB); Hatschbach, G. 27865 (MBM); Hatschbach, G. 501061 (MBM); Hatschbach, G. 5390 (MBM, SPF); Hatschbach, G. 68135 (ESA, FLOR, MBM, UPCB); Hatschbach, G. 610605 (ESA, MBM); Heringer, E.P. 788 (SP); Irwin, H.S. 21807 (K, RB); Irwin, H.S. 210262 (RB); Kinoshita-Gouvêa, L.S. 1084310 (UEC); Krieger, L. 8278 (CESJ, HUFU); Krieger, L. 9488 (BHCB, CESJ, ESA, RB); Kubo, M. s.n (SPF); Loeuille, B. 815 (SPF); Magalhães, M. 43610 (BHCB, RB); Marques, D. 255 (HUFU); Marques, D. 372 (HUFU); Marques, D. 468 (HUFU); Mello-Barreto, H.L. s.n. (R); Mello-Silva, R. 3653 (SPF); Melo, P. H. A. 3275 (ESAL); Mexia, Y. 5857 (BM, G, K); Nakajima, J.N. 21074 (HUFU, US); Nogueira, M. 35 (135); Oliveira, S.S. s.n. (UB); Ordones, J. 4108 (BHZB); Paiva, E.V.B. s.n. (UEC); Pereira, E. 1650 (RB); Pirani, J.R. 3710 (SPF); Pirani, J.R. 4052 (SPF); Pirani, J.R. 51003 (CEN, SPF); Pirani, J.R. CFCR 8573 (BHCB, MBM, SPF); Pirani, J.R. CFCR8573 (BHCB, MBM, SPF); Pirani, J.R. CFCR12185 (SPF); Riedel, L. 1427 (P); Riedel, L. 1483 (P); Riedel, L. s.n. (G, K); Saint-Hillaire, A. 12107 (P); Saint-Hillaire, A. 1303 (P); Saint-Hillaire, A. 1306 (P); Saint-Hillaire, A. 13310 (P); Saito, E. 1000 (ESAL); Sampaio, J. 422 (R); Savassi-Coutinho, A.P. 905 (ESA); Semir, J. 905101 (UEC); Semir, J. 42753 (UEC); Shepherd, G. 90171 (UEC); Silveira, 1972 (R); Silveira, s.n. (R); Silveira, A. s.n. (R); Simão, R. s.n. (SPF); Smith, L.B. s.n. (P); Sobral, M. 136610 (UFG, HUFSJ); Sobral, M. 15525 (HUFSJ, RB); Stehmann, J. 28103 (BHCB); Tameirão-Neto, E. 2886 (BHCB); Vauthier, A.C. 320 (P); Verdi, M. 6883 (SPF, RB); Weddell, M. 15108 (P); Willians, L.O. 6375 (RB); Zappi, D.C. 9077 (K, SPF).

4. ***Calea parvifolia***

Aguiar, O.T. 12210 (HUPG, MBM); Aguiar, T.H. 98 (FUEL); Andrade-Lima, 61-3734 (IPA); Azevedo, M.L. 50 (FUEL); Azevedo, M.L. 14770 (ESA, UEC); Baccaro, M. 410 (HUCP); Baccaro, M. 57 (HUCP); Baitello, J.B. 2256 (MBM, SPSF); Baratela, K.C. 8 (FUEL); Barbosa, E.R. s.n. (FUEL); Barros, F. 21087 (SP); Barros, J.C. s.n. (HUPG); Barreto, K.D. 21044 (ESA); Barreto, K.D. 3264 (ESA); Beltrami, L. s.n. (HUCP); Brotto, M.L. 3175 (MBM); Carmo, M.R.B. 10 (HUFU, HUPG); Carmo, M.R.B. 47 (HUPG); Carmo, M.R.B. 86 (HUPG); Carmo, M.R.B. 151 (HUPG); Carmo, M.R.B. 174 (HUPG); Carmo, M.R.B. 1075 (HUPG); Carmo, M.R.B. 1770 (HUPG); Carmo, M.R.B. 1814 (HUPG); Caxambu, M.G. 1848 (MBM); Cervi, A.C. 2813 (UPCB); Cervi, A.C. 2858 (UPCB); Cervi, A.C. 4012 (UPCB); Cervi, A.C. 101000 (MBM); Cervi, A.C. 101073 (UPCB); Cervi, A.C. s.n. (UPCB); Christ, A.L. 646 (ICN); Christ, A.L. 665 (ICN); Cielo-Filho, R. 8106 (SPSF); Cielo-Filho, R. 10103 (SPSF); Curial, O. 520 (MBM); Delfrate, B.C. s.n. (HUPG); Dias, B.G. s.n. (FUEL); Dombrowski, L.T. 1048 (MBM); Dombrowski, L.T. 1385 (MBM); Dombrowski, L.T. 91074 (MBM); Dombrowski, L.T. 12058 (MBM); Dombrowski, L.T. 12341 (MBM); Dombrowski, L.T. 12383 (MBM); Dombrowski, L.T. 14021 (MBM); Dombrowski, L.T. 14251 (MBM); Domingos, P. s.n. (HUPG); Dunaiski Jr., A. 2664 (MBM); Dunaiski Jr., A. 492 (MBM); Dusen, P.K. 28010 (NY, R); Dusen, P.K. 8058 (K); Dusen, P.K. 10555 (BM, US); Dusen, P.K. s.n. (G); Dziewa, A. 35 (MBM); Eltz, J. 9 (HUCP); Engels, M. 8010 (MBM); Estevan, D.A. 6108 (FUEL, SP); Falkenberg, D.B. 2186 (FLOR); Ferreira, M.S. s.n. (HUPG); Ferrucci, M.S. 248 (MBM); Galvão, M.A. s.n. (HUPG); Gaudichaud-Beaupré, C. 406 (G); Gaudichaud-Beaupré, C. s.n. (P); Gibbs, P.E. 1725 (MBM, UEC); Gross, M.L. (HUPG); Hatschbach, G. 520 (MBM); Hatschbach, G. 2637 (MBM, RB); Hatschbach, G. 2777 (MBM, RB); Hatschbach, G. 35310 (MBM); Hatschbach, G. 6882 (MBM, RB); Hatschbach, G. 1094 (MBM); Hatschbach, G. 1095 (MBM, RB); Hatschbach, G. 9318 (MBM); Hatschbach, G. 120101 (MBM); Hatschbach, G. 176363 (MBM); Hatschbach, G. 26762 (MBM); Hatschbach, G. 270103 (MBM, RFA); Hatschbach, G. 310218 (MBM, UEC); Hatschbach, G. 45460 (MBM); Hatschbach, G. 59068 (MBM); Hatschbach, G. 528210 (MBM); Hatschbach, G. 58165 (MBM); Heinrich, I.A. s.n. (HUPG); Jonsson, G. 140a (US); Joyan, F. s.n. (HUPG); Kauano, E.E. (MBM); Kozera, C. 2285 (MBM); Kozera, C. 2300 (MBM); Kozera, C. 2624 (MBM); Kozera, C. 2850 (MBM,

UPCB); Kozera, C. 3022 (EFC); Kummrow, R. 14106 (MBM, UB); Kummrow, R. 1736 (MBM, UPCB); Landrum, L.R. 2520 (MBM); Leitão Filho, H.F. 46107 (UEC); Linsigen, L.V. 910 (BHCB, MBM); Linsigen, L.V. 144 (MBM); Linsigen, L.V. 145 (BHCB, HEPH); Lobo Jr., R.C. 14768 (ESA, FUEL, UEC); Lozano, E.D. 745 (HUCP, MBM, RB); Lozano, E.D. 1307 (MBM); Lozano, E.D. 1314 (MBM); Lozano, E.D. 1456 (MBM); Lozano, E.D. 1514 (MBM); Lozano, E.D. 159 (MBM); Lozano, E.D. 18102 (MBM); Lozano, E.D. 2438 (MBM); Luz, P. M. s.n. (HUPG); Magenta, M.A.G. 558 (SPF); Mamede, M.C. H. 618 (SP); Marcondes, A.T.P. s.n. (HUPG); Mattos, J. 12850 (SPSF); Mehl, H.O. s.n. (HUPG); Moraes, J.G. 18 (HUCP); Moreira, H. 375 (MBM, RB); Moreira-Filho, H. 185 (MBM); Moro, R.S. 7210 (HUPG); Moro, R.S. 1781 (HUPG); Moro, R.S. s.n. (HUPG); Moss, D. F. 15 (HUPG); Muller, F. s.n. (P); Nascimento, M.B.F. 4 (FUEL); Occhioni, P. 3440 (RFA); Occhioni, P. 4265 (RFA); Occhioni, P. 4755 (RFA); Occhioni, P. 8432 (RFA); Occhioni, P. 25842 (RFA); Oliveira, A.A.F. 3 (HUCP); Oliveira, H.F. s.n. (HUPG); Oliveira, P.I. 373 (MBM); Oliveira, S.S. s.n. (UEC); Paião, F.G. s.n. (FUEL); Pereira, E. 32810 (PEL); Pereira, E. 5255 (RB); Pimenta, J.A. s.n. (FUEL); Pitt, E. s.n. (HUPG); Poliquesi, C.B. 83 (MBM); Poliquesi, C.B. 624 (ESA, MBM); Rauscher, I. 26 (K, U); Reitz, R. 17442 (FLOR, P); Ribas, C. s.n (HUPG); Ribas, O.S. 1617 (MBM); Ribas, O.S. 2321 (FLOR, MBM); Ribas, O.S. 31064 (MBM); Ribas, O.S. 591 (HUCS, HUFU, MBM, UPCB); Riedel, L. 223 (P, US); Riedel, L. s.n. (P); Ristow, R. 588 (MBM); Ritter, L.M.O. s.n. (HUPG); Rocha, D.C. s.n. (HUPG); Rocha, P.L.R. 20 (ESA); Roderjan, C.V. 6410 (EFC, MBM); Roderjan, C.V. 1085 (EFC, HAS, MBM); Rodrigues, K.M.P. 14870 (ESA, FUEL, UEC); Romagnolo, M.B. 379 (HUFU); Romagnolo, M.B. 3870 (HUFU); Romão, G.O. 1653 (BHCB, ESA, SPF, UEC); Rosa, E.L. 1 (HUCP); Roubouts, J.E. 2613 (US); Ruas, P.M. s.n. (UEC, HUCP); Saint-Hillaire, A. 1302 (P); Santana, S.S. s.n. (FUEL); Santos-Silva, F. 1610 (UPCB); Scaramuzza, C.A.M. 95 (ESA); Scaramuzza, C.A.M. 123 (ESA); Scaramuzza, C.A.M. 5010 (ESA); Scaramuzza, C.A.M. 69 (ESA); Scaramuzza, C.A.M. 872 (ESA); Scaramuzza, C.A.M. 1083 (ESA, UEC); Schwacke, C.A.W. 2126 (R); Schwacke, C.A.W. 2215 (R); Schwacke, C.A.W. 2444 (R); Selusniaki, M. 1512 (HUCP); Selusniaki, M. 1735 (HUCP); Selusniaki, M. 1838 (HUCP); Selusniaki, M. 2073 (HUCP); Selusniaki, M. 21410 (HUCP); Selusniaki, M. 2178 (HUCP); Selusniaki, M. 2537 (HUCP); Semir, J. 390010 (UEC); Shepherd, G. 6161 (MBM, RB, SP, UEC); Silva, A.R. s.n. (HUPG); Silva, C.T. 1832 (FUEL, HUPG); Silva, R.A.G. s.n. (FUEL); Silva, J.S. 2331 (MBM); Silva, J.S. 3517 (MBM); Silva, J.S. 6046 (MBM); Simão, C. s.n. (EFC); Siqueira, E.L. 320 (CESJ); Siqueira, E.L. 757 (MBM); Siqueira, E.L. 990 (MBM); Smith, L.B. 14423 (FLOR, P, RB); Smith, L.B. 14750 (P, RB); Souza, L.A. 164 (HUFU); Souza, L.A. 183 (HUFU); Souza, V.C. 2440 (ESA, MBM, SPF, UEC); Souza, V.C. 31038 (ESA, UEC); Souza, V.C. 31081 (ESA, UNIP); Souza, V.C. 4755 (ESA); Souza, V.C. 694 (ESA, SP); Souza, V.C. 6178 (ESA, SP); Souza, V.C. 62010 (ESA, SP); Souza, V.C. 8857 (ESA, SP, SPF, UEC); Souza, V.C. 39080 (ESA); Souza, V.C. 40032 (CEN, ESA, RB, UEC); Stehmann, J. 42010 (SP); Swallen, J.R. 86106 (PEL); Takeda, I.J.M. 452 (HUPG); Takeda, I.J.M. s.n. (HUPG, MBM); Tessmann, G. 9051 (RB); Tessmann, G. 21088 (RB); Torezan, J.M.D. 712 (ESA, MBM, SPF, UEC); Valdemarin, K.S. 536 (UEC); Varavalho, M.A. s.n. (FUEL, UB); Verdi, M. 5625 (FURB, FLOR, RB); Vidal, J. 3-512 (R); Vidal, J. s.n. (R); Voltz, R.R. 1005 (EFC, MBM); Weir, J. 344 (BM, K); Yanzen, R.C. s.n. (HUPG); Ziller, S.R. 184 (EFC); Ziller, S.R. 1578 (MBM); Ziller, S.R. 189 (EFC, MBM).

5. *Calea phyllolepis*

Bordignon, S. s.n. (ICN); Bueno, O. 2310 (HAS); Bueno, O. 3653 (HAS); Bueno, V.R. 94 (HUFU, ICN); Camargo, O.R. 2840 (BLA, PACA, S); Cavalcanti, P.B. 1316 (MG); Dutra, J. 1524 (ICN); Dutra, J. 1582 (ICN); Dutra, J. s.n. (R); Friederishs, E. s.n. (PACA); Gaio, J. 516 (HUCS); Hagelund, K. 6062 (ICN); Hagelund, K. 7675 (ICN); Hagelund, K. 12130 (ICN); Hagelund, K. 12612 (ICN); Hagelund, K. 14383 (ICN); Hagelund, K. s.n. (ICN); Harter, B. 2805 (MPUC); Hatschbach, G. 510143 (MBM, US); Hatschbach, G. 644510 (MBM); Heiden, G. 2506 (ECT); Henz, E. s.n. (PACA); Hiltt, G. 21 (RB); Knob, A. 5884 (ICN, SALLE); Krapovickas, A. 38504 (IBGE); Larocca, J. 104013 (ICN); Longhi, S.J. s.n. (HDCF); Maier, W. s.n. (ICN); Malme, G.O.A. (S); Matzenbacher, N.I. s.n. (ICN); Mauhs, J. 3100 (PACA); Mauhs, J. 406 (PACA); Mizoguchi, K.M. 2361 (MO); Mondin, C.A. 231010 (ICN, PACA);

Mondin, C.A. 2520 (ICN, PACA); Mondin, C.A. 2533 (ICN, PACA); Mondin, C.A. 2606 (ICN, PACA); Mondin, C.A. 2871 (ICN, PACA); Mondin, C.A. 28710 (ICN, PACA); Mondin, C.A. 2882 (ICN, PACA); Mondin, C.A. 34102 (ICN, PACA); Mondin, C.A. s.n. (PACA); Paula-Souza, J. 14215 (ESA); Pereira, E. 8521 (RB); Pereira, E. 30854 (K); Rambo, B. 98 (HBR); Rambo, B. 452410 (K, US); Rambo, B. 54043 (RB); Rambo, B. s.n. (PACA, S); Savarais, M. 628 (MBM); Schwacke, C.A.W. s.n. (R); Sehnem, A. 1658 (PACA); Sehnem, A. 2635 (PACA); Sehnem, A. 4388 (PACA); Sehnem, A. 5663 (HUCS, PACA); Sehnem, A. 7834 (HUCS, PACA); Sehnem, A. s.n. (PACA); Sellow, F. 948 (RB); Sellow, F. s.n. (K); Silveira, N. 3263 (HAS); Silveira, N. 44210 (HAS); Silveira, N. 4530 (HAS); Smith, L.B. 16153 (FLOR, HBR, US); Sobral, M. 1622 (MBM, RFA); Sobral, M. 5376 (ICN, S, SP, SPF); Sobral, M. 8382 (ICN, MBM); Thessen, F. s.n. (PACA); Valduga, E. 603 (ECT, HUCS, MBML); Viana, E. 147 (RB); Vicentini, A. 167 (RB); Webster, G.L. 251052 (ICN); Zanella, C. s.n. (ICN, MBM, PACA, UNOP); Zanin, A. s.n. (ICN).

6. ***Calea pruskiana***

Gasper, A.L. 2746 (FURB, RB); Melo, E. 40100 (R); Robim, M. J. 224 (SPSF, UEC); Robim, M. J. 530 (SPSF, UEC); Santos-Filho, D. 1589 (IBGE, UEC); Venâncio, C.P. s.n. (HAS); Xavier, S. 10 (SPSF); Xavier, S. 2710 (SPSF).

7. ***Calea subintegerrima***

Barbosa, E. 3500 (MBM); Barbosa, I.F. s.n. (UPCB); Dombrowski, L.T. 610410 (MBM); Dusen, P.K. 10187 (GH, S, US); Dusen, P.K. 92106 (S); Engels, M. 776 (RB); Engels, M. 89 (MBM); Ferreira, P.C. 107 (MBM); Gasper, A.L. 3538 (FURB); Gasper, A.L. 3548 (FURB); Gasper, A.L. 35410 (FURB); Kozera, C. 90107 (MBM); Kozera, C. 2075 (MBM); Nogueira-Souza, N.F.K. s.n. (HUPG); Reitz, R. 6001 (HBR, US); Reitz, R. 9686 (RB); Reitz, R. 17853 (B, FLOR, P, US); Ritter, L.M.O. s.n. (HUPG); Ribas, O.S. 423 (MBM, PEL, UB); Ribas, O.S. 2255 (FLOR, MBM); Smith, L.B. 14522 (FLOR, P, RB, US); Speck, F. 2507 (JOI); Wasum, R. 3454 (ECT, HUCS, MBM).

8. ***Calea triantha***

Amaral, W. 22 (MBM); Amaro, D.V.E. 82 (SPSF); Bianchini 90106 (SPSF); Bida, A. 226 (UPCB); Brade, A.C. 5477 (SP); Brade, A.C. 6251 (US); Brade, A.C. 121028 (RB); Braga, R. 1710 (UPCB); Braga, R. 207 (UPCB); Braudas, M. 210001 (PAMG); Brotto, M.L. 2167 (MBM); Brotto, M.L. 4873 (MBM); Burchell, W.J. 3103A (P); Burchell, W.J. 4628 (K); Burchell, W.J. 1063178 (K); Camila, E. s.n. (HUPG); Campestrini, S. 355 (FLOR); Campestrini, S. 463 (FLOR); Campos, J. s.n. (SP); Capanema, C. s.n. (RB); Castellanos, A. 24684 (RB); Chaddad Jr., J.186 (ESA); Christ, A.L. 587 (ICN); Christ, A.L. 645 (ICN); Christ, A.L. 671 (ICN); Coleman, J.R. 386 (US); Cordeiro, J. 5136 (MBM, RB); Correa Gomes Jr., J. 1620 (SP); Cruz, J.M. 238 (B, ESA, HUCS, MBM); Cure, J.R. s.n. (UPCB); Dalezoario, K. s.n. (HUPG); Daniele, s.n. (HUPG); Davidse, G. 990 (SP); Davidse, G. 93108 (SP); Dombrowski, L.T. 1458 (MBM); Dombrowski, L.T. 1517 (MBM); Dombrowski, L.T. 24101 (MBM); Dombrowski, L.T. 21053 (MBM); Dombrowski, L.T. 5843 (MBM); Dombrowski, L.T. 5884 (MBM); Dombrowski, L.T. 51043 (MBM); Dombrowski, L.T. 10480 (MBM); Dombrowski, L.T. 993 (MBM); Dombrowski, L.T. 92100 (MBM); Dombrowski, L.T. 12342 (MBM); Dusen, P.K. 25108 (R); Dusen, P.K. 279 (R); Dusen, P.K. 21084 (R); Dusen, P.K. 3300 (R); Dusen, P.K. 10542 (US); Dusen, P.K. 9658 (BM, K); Dusen, P.K. 13807 (MO); Dusen, P.K. s.n. (R); Edwall, G. 16826 (US); Emmerich, M. 2381 (R); Emmerich, M. 50 (R); Engels, M. 780 (MBM); Engels, M. s.n. (MBM); Estevan, D.A. 531 (FUEL, HUFU, SP); Felix, L.P. 14 (UEC); Ferrucci, M.S. 355 (MBM); França, V.G. 310 (SP, SPF); Frazão, A. s.n. (RB); Fritz, M. 501 (R); Funez, L.A. 86810 (CRI); Gentry, A. 4108102 (MO, RBR); Gimenes, L. 16 (ESA); Glaziou, A. 16163A (P); Gomes Jr, J.C. 1620 (UB); Gonçalves, R. 157 (UPCB); Gonzaga, D.R. 1063 (RB); Gouvêa, L.S.K. 7310 (HUFU, UEC); Guillemin s.n. (P); Handro, O. 610 (SP); Hashimoto, G. 253 (SP); Hashimoto, G. 2010104 (SP); Hashimoto, G. 2010105 (SP); Hashimoto, G. 2010106 (SP); Hashimoto,

G. 2010108 (SP); Hatschbach, G. 90810 (MBM); Hatschbach, G. 2908 (MBM); Hatschbach, G. 3542 (MBM, RB); Hatschbach, G. 6881 (MBM, RB); Hatschbach, G. 810010 (MBM); Hatschbach, G. 18347 (MBM, RB, UEC); Hatschbach, G. 18450 (MBM, UPCB); Hatschbach, G. 231017 (MBM); Hatschbach, G. 263106 (MBM, UPCB); Hatschbach, G. 210158 (MBM); Hatschbach, G. 35813 (MBM); Hatschbach, G. 38057 (MBM, UEC); Hatschbach, G. 4951 (MBM); Hatschbach, G. 41447 (MBM); Hatschbach, G. 44531 (MBM); Hatschbach, G. 56387 (MBM); Hatschbach, G. 781008 (HUCS, MBM); Hatschbach, G. 710827 (MBM, RB); Heiden, G. 2312 (ECT); Hoehne, F.C. s.n. (SP); Hoehne, W. 434 (BHCB, MBM, SP); Hoehne, W. 2831 (SP, US); Hoehne, W. 16822 (SP, US); Hoehne, W. s.n. (K, R, SPF, SPSF, UEC); Imaguire, N. 2177 (MBM); Imaguire, N. 2366 (MBM); Imaguire, N. 2566 (MBM); Imaguire, N. 2684 (MBM); Imaguire, N. 2778 (MBM); Kameyama, C. 232 (SPSF); Khulmann, J.G. s.n. (RB); Kierski, M.I. 121 (MBM); Kinoshita-Gouvêa, L.S. 7310 (FUEL); Kozera, C. 474 (MBM, UPCB); Kozera, C. 2687 (EFC, MBM); Krapovickas, A. 2395 (G, MBM); Krapovickas, A. 233210 (MO); Krapovickas, A. 40787 (K, MO); Krieger, L. 76410 (HUFU); Krieger, L. 168610 (ESA, MBM, SPF); Krul, 166 (MBM); Kummrow, R. 200 (MBM); Kummrow, R. 448 (MBM); Kummrow, R. 1724 (MBM); Kummrow, R. 1737 (MBM); Kummrow, R. 1816 (MBM); Kummrow, R. 2181 (MBM); Kuniyoshi, Y.S. 6045 (EFC); Kuniyoshi, Y.S. 6145 (EFC); Lange, R.B. 12810 (MBM, R, RB, UPCB); Lange, R.B. 1353 (HBR, R, RB); Larocca, J. 106 (MBM); Leitão Filho, H.F. 1347 (UEC); Leitão Filho, H.F. 1854 (IBGE, UEC); Leite, P.S.J. s.n. (FCAB); Lewinsohn, s.n. (ICN); Lindeman, J. 424 (MBM, UB); Lindeman, J. 41076 (MBM, RB); Lozano, E.D. 882 (MBM); Lozano, E.D. 26210 (MBM); Lozano, E.D. 28107 (MBM); Luederwaldt, H. 168210 (SP, US); Lund. P. 405 (G); Lund. P. 866 (P); Magenta, M.A.G. 3105 (SPF); Magenta, M.A.G. 560 (SPF); Martins, A.C. 62 (UPCB); Maruyama, A. 312 (SPSF); Maruyama, A. s.n. (SPSF); Mattos, A. s.n. (RB); Mattos, J. 5332 (HAS); Mattos, J. 13228 (HAS); Mattos, J. 148101 (SP); Mattos, J. 15301 (SP); May, D. 200 (MBM); Mello-Silva, R. 3765 (SPF); Monteiro, D. 478 (CESJ); Moro, R.S. s.n. (HUPG); Mota, M.C. 145 (CTBS); Motta, J.T. 1762 (MBM); Motta, J.T. 45102 (MBM); Muller, F. s.n. (P); Oliveira, P.I. 177 (MBM); Pacheco, G. s.n. (EFC); Paciornick, E.F. 3310 (MBM); Pedersen, T.M. 9881 (L); Pedersen, T.M. 13736 (MO); Pereira, E. 5901 (B, RB, RFA); Pereira, E. 82810 (RB, K); Pereira, E. 8703 (K, PEL, RB); Pereira, S.C. 808 (UEC); Pickel, B. 46105 (IPA); Pirani, J.R. s.n. (MBM); Pitt, E. s.n. (HUPG); Pizarro, D. s.n. (P); Possebon, G.C. 4 (HUCP); Rawitscher, F.K. s.n. (SP, SPF); Regnell, A.F. I-902 (BHCB, R); Reitz, R. 44100 (HBR); Reitz, R. 52310 (HBR, US); Reitz, R. 6614 (RB); Reitz, R. 12288 (RB); Reitz, R. 123610 (RB); Rezende, M.G. 6 (HUFU, UFG); Ribeiro, C. 314 (ICN); Ribas, O.S. 68 (MBM); Ribas, O.S. 478 (MBM, PEL); Ribas, O.S. 9310 (BHCB, MBM, PEL, RB, SPF, SPSF, UB); Ribas, O.S. 1647 (FLOR, MBM); Riedel, L. 946 (K); Riedel, L. 1748 (R); Riedel, L. s.n. (P); Ristow, R. 4310 (MBM); Ritter, L.M.O. s.n. (HUPG); Rodrigues, J. s.n. (HUPG); Saito, Y. 1471 (MBM); Santos, N. s.n. (R); Sasaki, D. 37 (SPF); Savarais, M. 328 (MBM); Savarais, M. 603 (MBM); Schimidt, F.G. 1 (HUCP); Schwacke, C.A.W. 2216 (R); Schwirkowski, P. 2736 (FURB); Schwirkowski, P. 32710 (FPS); Schwirkowski, P. 31051 (FPS, FURB); Schwirkowski, P. s.n. (FPS); Sellow, F. s.n. (P); Selusniaki, M. 2165 (HUCP); Selusniaki, M. 2902 (HUCP); Selusniaki, M. 3090 (HUCP); Silva, A.R. 2681 (HUPG); Silva, E.A. 105 (ESA); Silva, J.M. 2906 (HUCS, MBM, RB); Silva, J.M. 9761 (MBM); Silva, J.S. 688 (ESA, RB); Silva, J.S. 1428 (BHCB, HUFU, MBM); Silva, J.S. 21006 (HUCS, MBM); Silva, J.S. 107100 (MBM, RB); Silva, S. S. C. 9 (MBM); Smith, L.B. 10156 (HBR); Smith, L.B. 10345 (US); Smith, L.B. 10418 (RB); Smith, L.B. 9061 (HBR); Smith, L.B. 9605 (R, R); Smith, L.B. 9162 (R, RB); Smith, L.B. 9280 (RB); Smith, L.B. 1293 (RB); Souza, L.A. 250 (HUFU); Souza, V.C. 5124 (ESA, HUFU, UEC); Souza, V.C. 34051-a (ESA); Souza, V.C. 38905 (ESA, RB); Souza, V.C. 4093 (CEN, ESA); Speck, F. 2461 (JOI); Takeda, I.J.M. s.n. (HUPG, MBM); Tamandaré, F. s.n. (RB); Tessmann, G. s.n. (RB); Tessmann, G. s.n. (RB); Vichnieski, M.A. s.n. (HUPG); Vidal, J. 3-41 (R); Vidal, J. 3-43 (R); Vieira, A.O.S. 12242 (IBGE, MBM, UEC); Veira, R.F. 39 (CEN, HUFU); Vieira, R.S. 1035 (EFC); Voslach, 921 (R); Widgren, J.F. s.n. (P, U); Ziller, S.R. 1704 (EFC, MBM).

9. *Calea* × *malmeana* nothosp. nov.

Barbosa, E. 12103 (FURB, MBM); Dombrowski, L.T. 495 (MBM); Dombrowski, L.T. 12761 (MBM); Dusen, P.K. 10553A (BM, US); Ziller, S.R. 1736 (EFC).

10. *Calea* × *parviantha*

Baitello, J.B. 2051 (SPSF, UEC); Baitello, J.B. 2236 (MBM, SPSF); Bueno, F. s.n. (R); Cervi, A.C. 3546 (UPCB); Dombrowski, L.T. 14258 (MBM); Dusen, P.K. 10187 (GH, S, US); Dusen, P.K. 16905 (MO, US); Eugênio, J. s.n. (RB); Kinupp, V.F. 273 (FUEL, HUPG); Kozera, C. 2688 (MBM); Kozera, C. s.n. (HUPG); Muller, F. 214 (P); Muller, C. 510104 (FUEL, UEC); Ribeiro, Jr, A.I. 4 (SP); Stehmann, J. 21610 (BHCB, UEC); Vidal, J. 3-151 (R).