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FOUR NEW SPECIES OF *PLEROMA* (MELASTOMATACEAE) FROM CAMPOS RUPESTRES AND VEGETATION ON GRANITIC INSELBERGS IN EASTERN MINAS GERAIS, BRAZIL

R. Goldenberg[1], **P. M. Gonella**[2] **& F. S. Meyer**[3]

Eastern Minas Gerais has been historically neglected regarding biodiversity sampling effort. However, recent botanical explorations have revealed several new taxa for its flora, especially from disjunct fragments of campos rupestres vegetation, which form a mosaic with granitic inselbergs in the region. In this article, we add four new species of *Pleroma* (Melastomataceae) to the growing list of new taxa: *P. brevicomosum*, *P. caetanoi*, *P. miconiifolium* and *P. petrophylax*. We provide descriptions, detailed photographs, taxonomic comparisons, a distribution map and conservation status assessments for these new taxa. All four species are assessed under a category of threat, highlighting the need for conservation actions in these biodiverse albeit still poorly known areas.

Keywords. Melastomateae, new species, taxonomy, threatened species, *Tibouchina sensu lato*.
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Introduction

The mesoregion of Vale do Rio Doce (IBGE, 1990), in eastern Minas Gerais, Southeast Brazil, has been historically neglected regarding sampling effort for biological inventories, with vast areas lacking any representation in biological collections (SpeciesLink, 2022). In addition to the lack of knowledge about the biodiversity of Vale do Rio Doce, its local economy has always been focused on the development of activities related to the extraction of natural resources, resulting in widespread environmental degradation (May *et al.*, 2019). Another aggravating factor is the fact that the region is largely unprotected and neglected in the delimitation of official priority areas for conservation (Sisema, 2021).

Recent work carried out along the eastern portion of Vale do Rio Doce, near the border with Espírito Santo, has highlighted the botanical diversity and biological shortfalls of the region through the description of new and endemic taxa from diverse lineages (Gonella *et al.*, 2015; Mello-Silva, 2018; Kollmann, 2020; Andrino & Gonella, 2021; Antar *et al.*, 2021a, 2021b; Mezzonato-Pires *et al.*, 2021). This is especially true around the João Pinto Formation, a geological group of Neoproterozoic quartzites forming a small and fragmented mountain complex with campos rupestres vegetation (Oliveira, 2000). These quartzitic outcrops lie close to granitic and gneissic inselbergs, which are inhabited by a distinctive

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assemblage of rupicolous taxa (Porembski *et al.*, 2003). Although the two substrates have different plant taxa, their close proximity allows interchange of species (Antar *et al.*, 2021b).

Both the campos rupestres and vegetation on inselbergs are rich in species of the angiosperm family Melastomataceae (Goldenberg *et al.*, 2012). The region described above, plus an extended area along the border between Minas Gerais and neighbouring Espírito Santo, is particularly rich in species of *Pleroma*, a genus that has been recently resurrected as part of the breaking up of the former *Tibouchina sensu lato* (Michelangeli *et al.*, 2013; Guimarães *et al.*, 2019). The description in the past 20 years of 14 species belonging to this group, from both sides of the border (Guimarães *et al.*, 2002; Romero *et al.*, 2009; Meirelles *et al.*, 2012; Fraga & Guimarães, 2014; Goldenberg & Kollmann, 2016; Meyer *et al.*, 2016, 2018), can be explained by its richness but also by the above-mentioned shortfalls: much attention has been given to Bahia (directly to the north; Freitas *et al.*, 2013), especially the Chapada Diamantina (see Freitas *et al.*, 2012; Guimarães & Freitas, 2012; Freitas & Van den Berg, 2016; Freitas *et al.*, 2016), and to the southern portion of the Espinhaço Range in Minas Gerais (directly to the west; see Semir *et al.*, 1987; Fidanza *et al.*, 2015), the Minas Gerais iron province (to the southwest; see Oliveira et al., 2014; Romero *et al.*, 2012), and Rio de Janeiro (to the south; Cogniaux, 1885), whereas there remained a dearth of collections from eastern Minas Gerais and Espírito Santo.

As part of the effort to address taxonomic gaps in the region, particularly regarding Melastomataceae, we describe four new species of *Pleroma* from the campos rupestres and granitic inselbergs of eastern Minas Gerais, highlighting this region as a priority for conservation and biological research.

Materials and methods

This work was based mostly on collections made by one of the authors (P.M.G.) in 2017–2021. The specimens have been deposited in MBM, MBML, SPF and UPCB (Thiers, continuously updated). We carried out a thorough search of online databases (Reflora, 2021; SpeciesLink, 2022) and found one specimen at SPF that was not seen *in loco*; it is indicated as seen online in the respective paratype list. Morphological terms follow Radford (1974) and previous articles by the third author (F.S.M.). Comparisons with present species of *Pleroma* were based on examination of herbarium specimens, including types (all specimens listed in the **Appendix**) and protologues (Cogniaux, 1885, 1891; Goldenberg & Kollmann, 2016; Meyer *et al.*, 2016, 2018).

The distribution map was generated in QGIS 3.12 software (QGIS Development Team, 2021) using layers available from IBGE (2021) and SISEMA (2021). Coordinates were obtained in the field or from herbarium specimens.

Preliminary conservation status assessments follow the *IUCN Red List Categories and Criteria*, version 3.1 (IUCN, 2012). Rapid assessments were performed using the conservation assessment tool GeoCAT (Bachman *et al.*, 2011), with estimations of extent

of occurrence (EOO) and area of occupancy (AOO) based on a standard cell size of 4 km^2.

Taxonomic treatment

1. Pleroma brevicomosum F.S.Mey. & R.Goldenb., **sp. nov.**

Pleroma brevicomosum differs from *P. divaricatum* (Cogn.) P.J.F.Guim. & Michelang. by its ovate leaves (versus oblong-lanceolate in *P. divaricatum*), these being chartaceous (versus membranaceous) and strigose on the adaxial surface (versus sericeous); slightly dimorphic stamens (versus pronouncedly dimorphic); elongate style, 13.3–14.1 mm long (versus short, c.3 mm long); and ecostate capsules (versus costate). – Type: Brazil, Minas Gerais, Conselheiro Pena, Serra do Padre Ângelo, Pico do Padre Ângelo, Platô do topo do pico, 19°19'5.04"S, 41°34'42.26"W, 1480 m, 11 vii 2020, *P.M. Gonella, R.S. Ribeiro, G.A. da Silva, A.P. Araújo & J.C. Ribeiro* 1425 (holotype UPCB, isotype MBML). **Figures 1, 2.**

Erect to decumbent shrubs 0.4–0.7 m tall, with sympodial growth, poorly branched. *Younger branches* terete, not winged, moderately strigose, trichomes 0.5–1.5 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked; *older branches* terete, not winged, with indument similar to younger branches, but deciduous, and basally decorticating; *nodes* slender. *Leaves* opposite; chartaceous, with petioles very short, 0.9–2 mm long; *blades* 2.2–4.3 × 1.9–2.9 cm, chartaceous, slightly discolorous, ovate, lacking domatia on the abaxial surface, base cordate, apex acute, margins crenulate, 5 acrodromous nerves, the marginals tenuous, adaxial surface flat, brown in dry specimens, bright green in fresh material, moderately strigose, trichomes 0.5–1.5 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked, abaxial surface flat, light brown or pale green in dry specimens, pale green in fresh material, moderately strigose to setulose on the primary and secondary veins, trichomes 0.8–1.8 mm long, unbranched, eglandular, appressed or curved, the base slightly broadened, not immersed, not forked, but moderately strigose to setulose on the surface, tertiary and quaternary veins, trichomes 0.1–0.6 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked. *Thyrsoids* 9–26.5 × 5–10 cm, terminal, c.15–25 flowers, axis terete, with the same indumentum as the younger branches, reddish; *bracts* late deciduous, leafy, petioles short, 0.6–1.1 mm long, blade 21.4–24.9 × 17.2–21.9 mm, ovate, indumentum the same as on the leaves; *bracteoles* early deciduous, 5.5–6 × 3.3–3.7 mm, elliptic or ovate, apex rounded, not covering the apex of the flower bud, margins entire, ciliate, adaxial surface glabrous, abaxial surface moderately strigose or moderately setulose, with indument uniformly arranged along the entire abaxial surface, trichomes 0.3–0.9 mm long, unbranched, eglandular, appressed or curved, the base linear or slightly broadened, not immersed, not forked. *Flowers* 5-merous, pedicels 0.7–1 mm long; *hypanthium* 5.4–5.8 × 5–5.3 mm, obovate, not costate, moderately setulose, trichomes 0.4–1.3 mm long, unbranched, eglandular, curved,

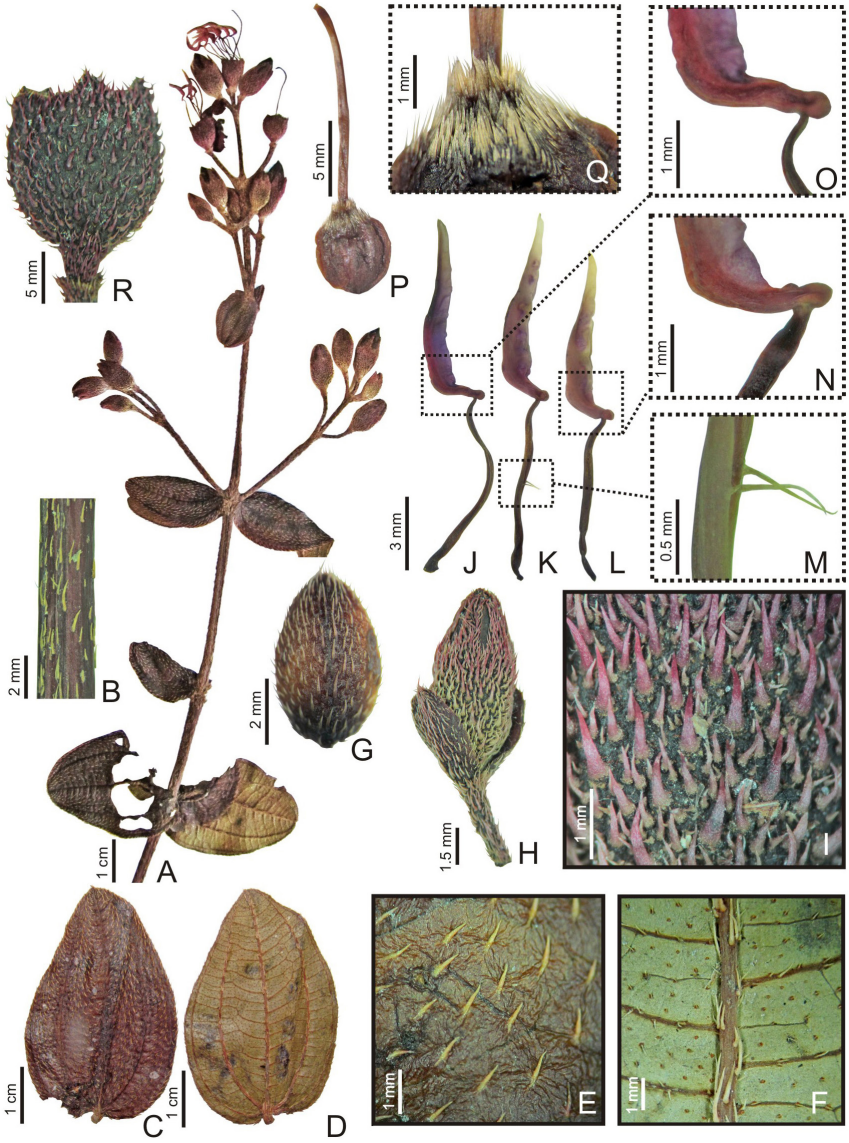

Figure 1. *Pleroma brevicomosum* F.S.Mey. & R.Goldenb., sp. nov. A, Branch with inflorescence; B, surface of a young branch; C, leaf (adaxial surface); D, leaf (abaxial surface); E, detail of the leaf indument (adaxial surface); F, detail of the leaf indumentum (abaxial surface); G, bracteole (abaxial surface); H, flower bud and bracteoles; I, detail of the indument on the hypanthium (abaxial surface); J, antesepalous stamen with a glabrous filament; K, antesepalous stamen with a pair of trichomes on the filament; L, antepetalous stamen; M, detail of the two trichomes shown in K; N, detail of the connective and appendages shown in L; O, detail of the connective and appendages shown in J; P, ovary, detached from the hypanthium; Q, ovary apex; R, immature capsule without the deciduous sepals. All from the holotype, *Gonella* et al. 1425 (UPCB). Photographs: F. S. Meyer.

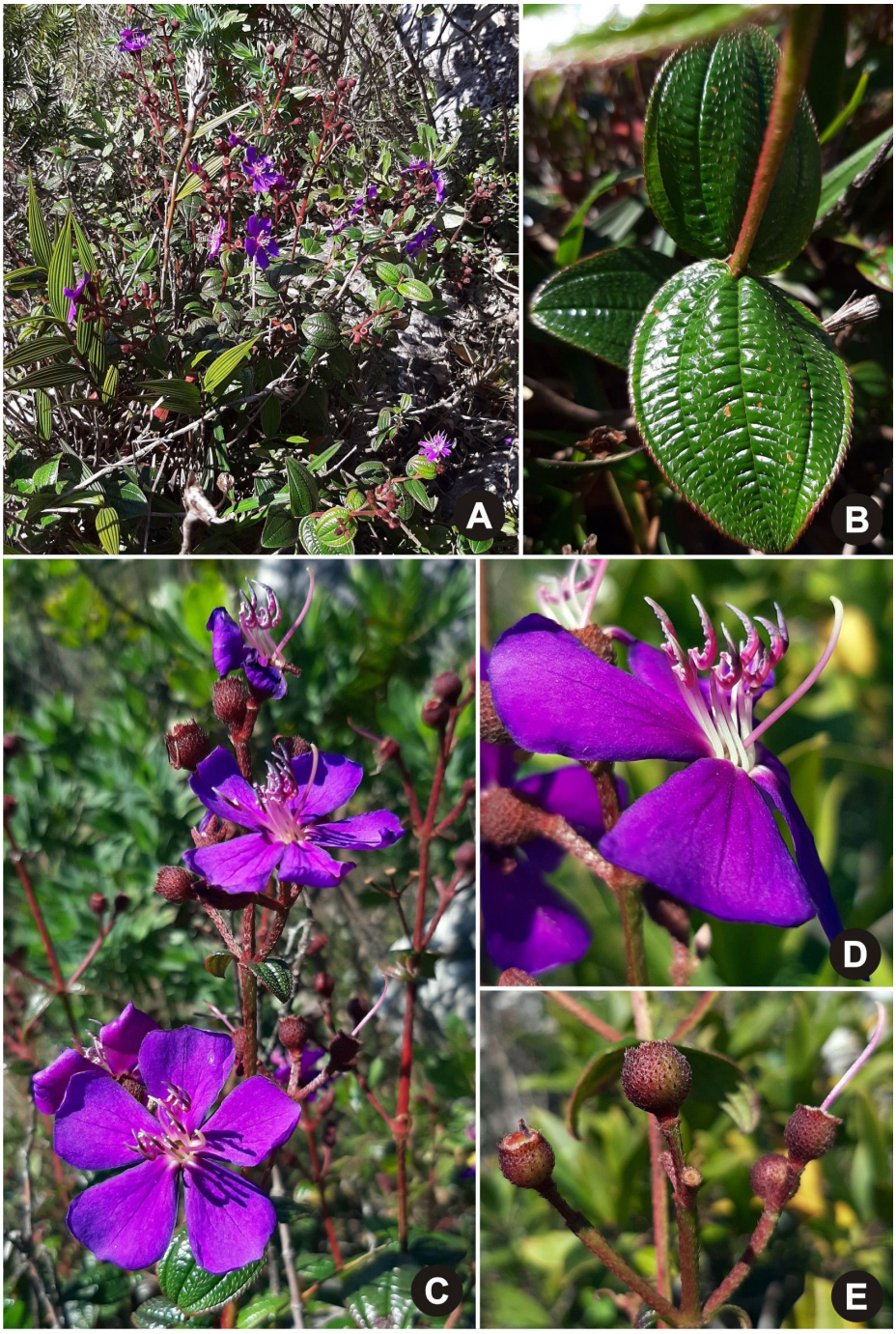

Figure 2. *Pleroma brevicomosum* in the field. A, Plant growing on quarzitic substrate; B, leaf pair (adaxial surfaces); C, inflorescence; D, flower (lateral view); E, immature capsules. Photographs: P. M. Gonella.

the base broadened, not immersed, not forked; *sepals* early deciduous, 4–4.3 × 2–2.3 mm, triangular, margins ciliate, apex acute, adaxial surface glabrous, abaxial surface with the same trichomes as the hypanthium, but restricted to its central portion; *petals* purple with a white base (during anthesis) or purple with a red base (in senescent flowers), 22.7–25.8 × 19–21.2 mm, obovate, apex cuspidate or mucronate, ciliate; *stamens* 10, slightly dimorphic, antesepalous with the filaments white (during anthesis) or purple to reddish (in senescent flowers), 7.3–8.3 mm long, glabrous or sparsely setulose on its central portion, trichomes 0.6–0.8 mm long, unbranched, eglandular, curved to erect, the base linear, not immersed, not forked, pedoconnective purple, 0.6–0.9 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex obtuse, c.0.4 mm long, glabrous, thecae 7.1–7.6 × 1–1.1 mm, falcate, purple, antepetalous with filaments white (during anthesis) or purple to reddish (in senescent flowers), 6.6–7.1 mm long, glabrous, pedoconnective purple, 0.3–0.4 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex obtuse, c.0.5 mm long, glabrous, thecae 6.4–6.7 × 1 mm, falcate, purple; *ovary* 5.5–6.1 × 4.9–5.2 mm, 5-locular, apex densely sericeous, trichomes 0.5–1.3 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked; *style* purple in the basal three-quarters and white in its apical portion (both during anthesis and in senescent flowers), 13.3–14.1 mm long, apex curved, glabrous, stigma truncate. *Capsular fruits* 6.3–8 × 6–8.1 mm, sepals early deciduous, epicarp undivided when mature, ecostate.

Distribution and habitat. *Pleroma brevicomosum* was collected around the higher peaks of the João Pinto Formation, east Minas Gerais, Southeast Brazil (**Figure 3**), in campos rupestres on sandy soil and quartzitic rock outcrops, as both terrestrial and rupicolous. The species was found at Serra do Padre Ângelo (municipality of Conselheiro Pena), in the Pico do Padre Ângelo, around 1480–1540 m, and at the Pico do Sossego, around 1275 m. It was also collected at the Pico da Aliança (municipality of Alvarenga), around 1400 m. The species was found syntopic with other endemic taxa of the region, such as *Drosera magnifica* Rivadavia & Gonella (Droseraceae; Gonella *et al.*, 2015), *Eremanthus ovatifolius* Loeuille & Pirani (Asteraceae; Loeuille & Pirani, 2016), *Lepidaploa campirupestris* Antar & Loeuille (Asteraceae; Antar *et al.*, 2021b) and *Paepalanthus oreodoxus* Andrino & Gonella (Eriocaulaceae; Andrino & Gonella, 2021). At the three localities, the species is syntopic with *Pleroma caetanoi*, described below.

Phenology. Collected with flowers and fruits in May and July.

Proposed IUCN conservation category. Critically Endangered: CR B1ab(iii). With estimates of EOO = 43.378 km^2 and AOO = 12 km^2, *Pleroma brevicomosum* is isolated at the higher areas of the João Pinto Formation, and has a severely fragmented distribution, which hinders pollen and seed dispersal among the areas. The three areas where the species was found are under active invasion by African grasses, most remarkably *Melinis minutiflora* P.Beauv. (Poaceae), which is found even in pristine areas that are not in direct contact with

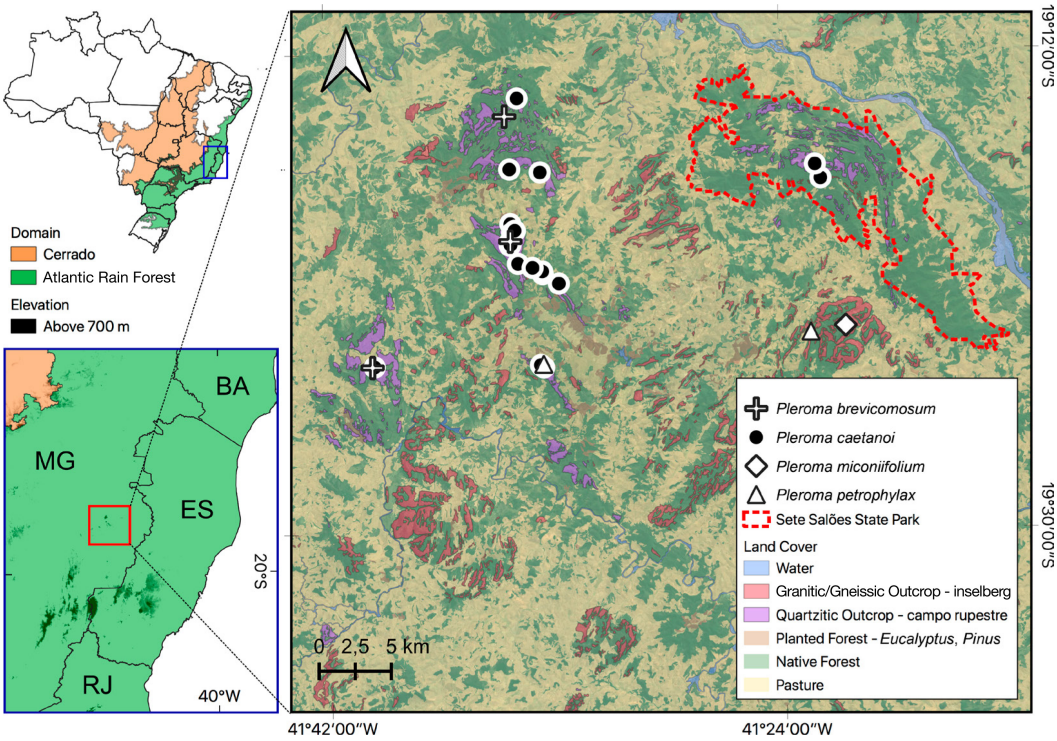

Figure 3. Distribution in Minas Gerais (MG), Brazil, of the four new species described in this article. BA, Bahia; ES, Espírito Santo; RJ, Rio de Janeiro.

pastures, including the habitat of this species. The subpopulation at Pico do Padre Ângelo was directly affected by a catastrophic anthropogenic fire in early October 2020, which also affected other endemics (Andrino & Gonella, 2021; Antar *et al.*, 2021b; Kollmann & Gonella, 2021); post-fire resprout has not been monitored. At all sites, the populations of *Pleroma brevicomosum* are small and scattered, with fewer than 10 flowering individuals observed at each site during fieldwork. Based on the available data, the species is, therefore, preliminarily assessed as Critically Endangered according to IUCN criteria (IUCN, 2012).

Etymology. The specific epithet, *brevicomosum*, is related to the indument with short trichomes on the hypanthium and leaves of this species.

Additional specimens examined. Brazil. **Minas Gerais**: Alvarenga, Pico da Aliança, no topo do pico, 19°23'44.91"S, 41°40'13.52"W, 1400 m, 9 v 2021, *P.M. Gonella* et al. 2866 (MBML, UPCB); Conselheiro Pena, Serra do Padre Ângelo, Serra do Pinhão, subida para o Pico do Sossego, 19°14'23.33"S, 41°34'52.51"W, 1275 m, 2 v 2021, *P.M. Gonella* et al. 2524 (MBML).

Pleroma brevicomosum is morphologically closely related to *P. divaricatum*; both occur in the state of Minas Gerais and are erect shrubs with sessile or almost sessile leaves,

thyrsoid inflorescences, and flowers with setulose hypanthia and purple petals. *Pleroma brevicomosum* differs from *P. divaricatum* by the characters described in the diagnosis, and also by its larger hypanthia, 5.4–5.8 × 5–5.3 mm (versus 2–2.3 × 2–2.4 mm in *P. divaricatum*).

Pleroma brevicomosum also resembles some species of *Pleroma* formerly recognised in *Tibouchina* Aubl. sect. *Diotanthera* Triana (*sensu* Cogniaux, 1885, 1891), such as *P. australe* Triana, *P. cordifolium* (Cogn.) P.J.F.Guim. & Michelang. and *P. mosenii* (Cogn.) P.J.F.Guim. & Michelang., by its ovate leaves, thyrsoid inflorescences, setulose hypanthia, stamens with glabrous filaments and pedoconnectives, glabrous styles and ecostate fruits.

Pleroma brevicomosum differs from *P. australe* by its terete branches (versus quadrangular in *P. australe*) and its smaller leaves, 2.2–4.3 × 1.9–2.9 cm (versus 9.1–10.8 × 4.6–7.5 cm), with crenulate margins (versus serrated), only 5 nerves (versus 7–9), and short petioles, 0.9–2 mm long (versus elongate, 4.9–13.1 mm long). It also differs from *Pleroma australe* by its smaller hypanthia, 5.4–5.8 × 5–5.3 mm (versus 7.5–8.6 × 5.3–5.5 mm); triangular, caducous (i.e. falling off immediately after anthesis) sepals, 4–4.3 mm long (versus oblong, 5.6–7.1 mm long sepals persisting on the hypanthium until the fruits are almost mature, then falling off when they are mature); and antesepalous stamens with a short pedoconnective, 0.6–0.9 mm (versus 4–4.3 mm long).

Pleroma brevicomosum differs from *P. cordifolium* by its terete branches (versus quadrangular in *P. cordifolium*) and its smaller leaves, 2.2–4.3 × 1.9–2.9 cm (versus 9–11.3 × 7.4–9.7 cm), with crenulate margins (versus serrated), only 5 nerves (versus 9), and shorter petioles, 0.9–2 mm long (versus 12–19.8 mm long). It also differs from *Pleroma cordifolium* by its smaller hypanthia, 5.4–5.8 × 5–5.3 mm (versus 7.7–7.9 × 4.6–5.9 mm); antesepalous stamens with a short pedoconnective, 0.6–0.9 mm (versus 5.7–6.4 mm long); and ovary apex covered with eglandular trichomes (versus glandular).

Pleroma brevicomosum differs from *P. mosenii* by its terete branches (versus quadrangular in *P. mosenii*) and its smaller leaves, 2.2–4.3 × 1.9–2.9 cm (versus 7.5–11.6 × 4.6–8.7 cm), with only 5 nerves (versus 9–11), and shorter petioles, 0.9–2 mm long (versus 10.8–35.3 mm long); antesepalous stamens with a short pedoconnective, 0.6–0.9 mm (versus 4–4.5 mm long); and smaller fruits, 6.3–8 × 6–8.1 mm (versus 7.3–9.5 × 5–5.9 mm), with caducous sepals (versus sepals persisting on the hypanthium until the fruits are almost mature, then falling off when they are mature).

Pleroma brevicomosum is related to *P. ackermannii* (Cogn.) P.J.F.Guim. & Michelang. by its strigose branches; its leaves with a short petiole (1.6–2.4 mm long in *P. ackermannii*), with a brown (in dried specimens) and moderately strigose adaxial surface, and with 5 nerves; and also by its elliptic or ovate bracteoles, and its glabrous style. It differs from *Pleroma ackermannii* by its ovate leaves (versus elliptic), with a cordate base (versus obtuse), these being smaller, 2.2–4.3 × 1.9–2.9 cm (versus 3.8–5 × 1.8–2.7 cm); its bracteoles with the indument arranged along the entire abaxial surface (versus on only the central portion); its

setulose hypanthia (versus sericeous); and its stamens with glabrous or sparsely setulose filaments (versus moderately villose).

2. Pleroma caetanoi F.S.Mey. & R.Goldenb., **sp. nov.**
Pleroma caetanoi differs from *P. decemcostatum* (Cogn.) P.J.F.Guim. & Michelang. by its shorter petioles, 1.2–3.6 mm long (versus 4.2–13.8 mm long in *P. decemcostatum*) and its concolorous leaves (versus discolorous), these being scabrose on the adaxial surface (versus sericeous) and pilose on the abaxial surface (versus villose). – Type: Brazil, Minas Gerais, Conselheiro Pena, Serra do Padre Ângelo, Serra da Palha Branca, afloramento quartzítico atravessado por estrada que sai do mirante da Bela, 19°20'13.4"S, 41°33'27.6"W, 1030 m, 30 i 2021, *P.M. Gonella, D.P. Cordeiro, G.A. da Silva, P.R. Bartholomay & J.C. Ribeiro* 1920 (holotype UPCB, isotype MBML). **Figures 4, 5, 6.**

Erect shrubs 0.7–2 m tall, with sympodial growth, poorly (in younger plants) to moderately (in older plants) branched. *Younger branches* terete to quadrangular, not winged, moderately to densely setulose, trichomes 0.3–1.4 mm long, unbranched, eglandular, curved, the base slightly broadened, not immersed, not forked; *older branches* quadrangular, angulose, with indument similar to younger branches, but deciduous, and basally decorticant; *nodes* slender. *Leaves* opposite; chartaceous, with petioles very short, 1.2–3.6 mm long; *blades* 2–8.2 × 1.7–4.8 cm, chartaceous, concolorous, ovate to orbiculate, lacking domatia on the abaxial surface, base cordate, apex acute to obtuse, margins crenulate, 5–7 acrodromous nerves, the marginals tenuous, adaxial surface flat, dark green or brown in dry specimens, dark green in fresh material, moderately to densely scabrous, trichomes 0.7–2.7 mm long, unbranched, eglandular, curved, the base strongly broadened, not immersed, not forked, abaxial surface flat, light brown in dry specimens, light green to whitish green in fresh material, moderately setose to strigose on the primary and secondary veins, trichomes 0.4–2.6 mm long, unbranched, eglandular, appressed or curved, the base slightly broadened, not immersed, not forked, densely pilose on the surface, tertiary and quaternary veins, trichomes 0.2–0.7 mm long, unbranched, eglandular, erect, the base linear, not immersed, not forked. *Thyrsoids* 6.5–21 × 7–15 cm, terminal, c.59–140 flowers, axis quadrangular, moderately setulose to setose, trichomes 0.3–1.4 mm long, unbranched, both eglandular and glandular, curved to erect, the base slightly broadened, not immersed, not forked, reddish; *bracts* late deciduous, leafy, petioles short, 1–2.4 mm long, blade 15.6–62.3 × 11.8–39.4 mm, ovate to orbiculate, indumentum the same as on the leaves; *bracteoles* early deciduous, 4.2–7.5 × 1.9–3.7 mm, ovate, apex acute, not covering the apex of the flower bud, margins entire, ciliate, adaxial surface glabrous, abaxial surface moderately setose or setulose, with indument uniformly arranged along the entire abaxial surface, trichomes 0.3–2.1 mm long, unbranched, both eglandular and glandular, curved, the base linear or slightly broadened, not immersed, not forked. *Flowers* 5-merous, pedicels 0.7–1.4 mm long; *hypanthium* 3.2–4.3 × 2.7–3.7 mm, obovate, not costate, moderately to densely sericeous,

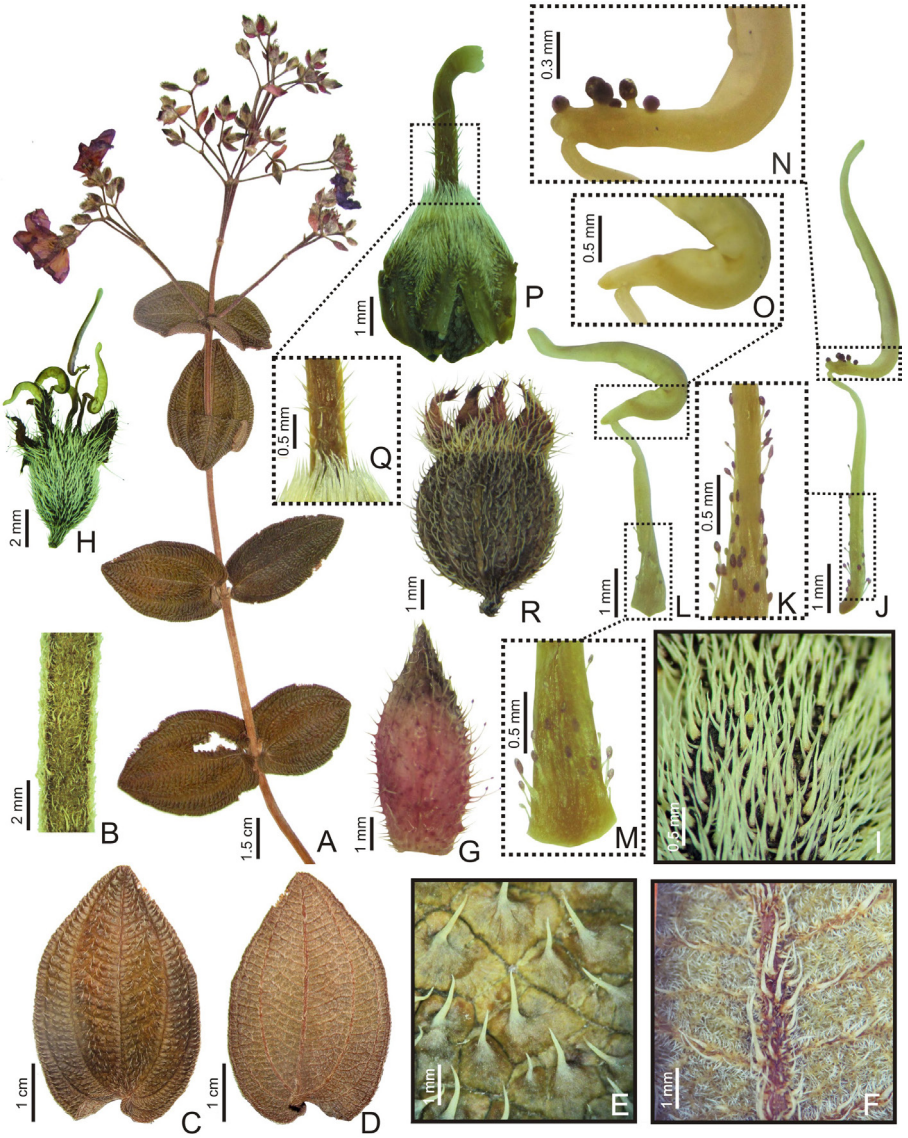

Figure 4. *Pleroma caetanoi* F.S.Mey. & R.Goldenb., sp. nov. A, Branch with inflorescence; B, surface of a young branch; C, leaf (adaxial surface); D, leaf (abaxial surface); E, detail of the leaf indument (adaxial surface); F, detail of the leaf indumentum (abaxial surface); G, bracteole (abaxial surface); H, flower without petals; I, detail of the indument on the hypanthium (abaxial surface); J, antesepalous stamen; K, detail of the setulose filament shown in J; L, antepetalous stamen; M, detail of the setulose filament shown in L; N, detail of the connective and appendages covered with glandular trichomes shown in J; O, detail of the glabrous connective and appendages shown in L; P, ovary, detached from the hypanthium; Q, ovary apex; R, immature capsule. All from the holotype, *Gonella* et al. 1920 (UPCB). Photographs: F. S. Meyer.

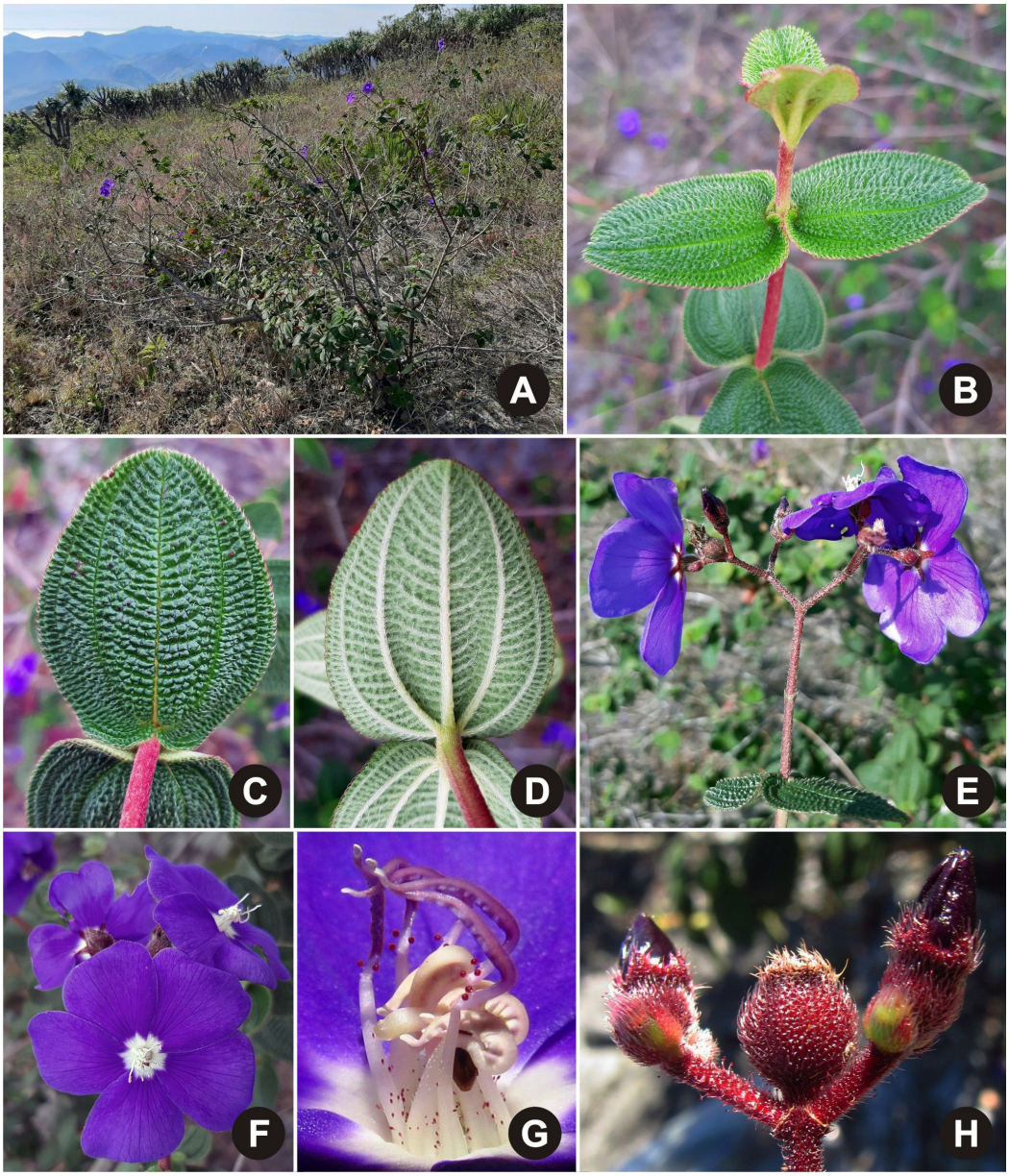

Figure 5. *Pleroma caetanoi* in the field. A, Plant growing on campos rupestres; B, young branch with almost sessile leaves; C, leaf (adaxial surface); D, leaf (abaxial surface); E, inflorescence (lateral view); F, flowers; G, detail of the stamens and style; H, part of the inflorescence with an immature capsule (in the centre of the cyme), and floral buds. Photographs: P. M. Gonella.

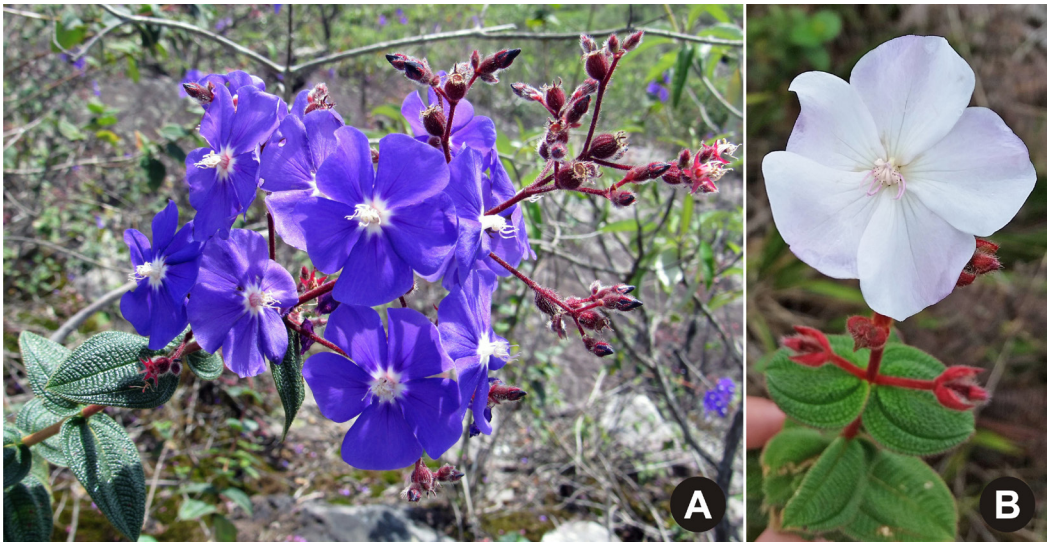

Figure 6. *Pleroma caetanoi* in the field. A, Specimen with purple petals (the most frequent pattern); B, specimen with white petals (less frequent). Photographs: P. M. Gonella.

trichomes 0.7–2.1 mm long, unbranched, both eglandular and glandular, appressed, the base linear to slightly broadened, not immersed, not forked; *sepals* late deciduous, 3.7–4.2 × 2–2.5 mm, triangular, margins ciliate, apex acute, adaxial surface glabrous, abaxial surface with the same trichomes as the hypanthium, distributed over the entire surface; *petals* purple with a white base (during anthesis) or purple with a red base (in senescent flowers), 17–21.2 × 17.5–19.6 mm, obovate, apex obtuse or truncate, ciliate; *stamens* 10, strongly dimorphic, antesepalous with the filaments white or rosy on its apex (during anthesis) to reddish (in senescent flowers), 4.8–5.8 mm long, moderately setulose on the basal two-thirds, trichomes 0.2–0.5 mm long, unbranched, glandular, curved, the base linear, not immersed, not forked, pedoconnective white, 0.9–1 mm prolonged below the thecae, moderately setulose, seldom glabrous, trichomes 0.1–0.3 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, ventral appendages bilobed, apex obtuse, c.0.1 mm long, glabrous or moderately setulose, trichomes c.0.1 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, thecae 4.9–5.4 × 0.3–0.4 mm, falcate, purple, antepetalous with the filaments white (during anthesis) or rosy to reddish (in senescent flowers), 3.8–4.1 mm long, moderately setulose on its basal portion, trichomes 0.2–0.5 mm long, unbranched, glandular, curved, the base linear, not immersed, not forked, pedoconnective white, 0.3–0.5 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex obtuse, c.0.2 mm long, glabrous, thecae 4.6–4.9 × 0.7–0.9 mm, falcate, white; *ovary* 4.8–5.1 × 3.6–3.8 mm, 5-locular, apex densely sericeous, trichomes 0.5–1.3 mm long, unbranched, eglandular, appressed, the base linear, not immersed,

not forked; *style* white (during anthesis and in senescent flowers), 5.4–6 mm long, apex curved, sparsely to moderately pilose on the basal two-thirds, trichomes 0.3–1 mm long, unbranched, eglandular, curved, the base linear, not immersed, not forked, stigma truncate. *Capsular fruits* 5.9–8.3 × 4.3–5.1 mm, sepals late deciduous, epicarp undivided when mature, costate.

Distribution and habitat. *Pleroma caetanoi* is endemic to the campos rupestres of the João Pinto Formation, being recorded from several fragments in this region (see **Figure 3**). It has been found in the Serra do Padre Ângelo, including Pico do Padre Ângelo, Serra do Pinhão and Serra da Palha Branca; Pico da Aliança; Serra da Onça, within Sete Salões State Park; and also at smaller fragments in the south of the municipality of Conselheiro Pena. The species grows on sandy soils on quartzitic outcrops, both as terrestrial and rupicolous, at elevations from 750 m to 1550 m.

Phenology. The species was collected or recorded with flowers and fruits year-round, except in March.

Proposed IUCN conservation category. Endangered: EN B1ab(iii) + B2ab(iii). Both the estimates for EOO = 310.907 km^2 and AOO = 48 km^2 meet the criteria for Endangered, which is also supported by the fragmented distribution. Despite being the most widespread of the species here described, *Pleroma caetanoi* was observed under the greater variety of threats, including invasive species (*Melinis minutiflora*; *Pteridium aquilinum* (L.) Kuhn, Dennstaedtiaceae; *Urochloa* sp., Poaceae), anthropic fires, human interference (motocross, trampling), clearance for smallholder grazing and silviculture, and presence of cattle in the habitat. The species was collected in a protected area, the Sete Salões State Park (*Brotto & Völtz* 4410). Given the restricted occurrence and the threats listed, the species is assessed as Endangered based on the criteria of the IUCN (IUCN, 2012).

Etymology. The name of this species honours Ednilson Caetano, who resides at the Serra do Padre Ângelo, where the species was first discovered. Ednilson and his family have kindly received in their home and guided in the Serra many botanists over the past decade, sharing their invaluable knowledge about the region and its plants, and participating in the discovery of many novelties from the area (see acknowledgements in Gonella *et al.*, 2015; Mello-Silva, 2018; Kollmann, 2020; Andrino & Gonella, 2021; Antar *et al.*, 2021a, 2021b; Kollmann & Gonella, 2021).

Additional specimens examined. Brazil. **Minas Gerais**: Alvarenga, Pico da Aliança, no topo do pico, 19°23'43.87"S, 41°40'8.54"W, 1435 m, 9 v 2021, *P.M. Gonella* et al. 2895 (MBML, UPCB); Conselheiro Pena, Pico do Padre Ângelo, subida ao pico, 19°18'40.5"S, 41°34'31.5"W, 1200 m, 16 xii 2016, *J.C. Lopes* et al. 449 (SPF 00227284 – image!); Serra do Padre Ângelo, Pico do Padre Ângelo, no platô do topo do Pico, 19°19'14.2"S, 41°34'43.7"W, 1530 m, 11 vi 2017, *P.M. Gonella* et al. 796 (SPF); Chapada do João Pinto, mirante da Bela Adormecida, 19°20'5"S, 41°33'50.3"W, 18 iv 2018, *L.J.C. Kollmann & R. Cipriano* 13495 (MBML 52967); Serra do Padre Ângelo, Córrego da Regina, aos pés da Serra do

Pinhão, 19°16'30.1"S, 41°33'29.7"W, 755 m, 3 xii 2018, *P.M. Gonella* et al. 953 (MBML); Serra do Padre Ângelo, Pico do Padre Ângelo, trilha para o topo, 19°18'25.4"S 41°34'41.7"W, 1000 m, 4 xii 2018, *P.M. Gonella* et al. 970 (MBML); Serra do Padre Ângelo, Pico do Padre Ângelo, no platô do topo do Pico, 19°19'6.9"S, 41°34'43.8"W, 1400–1500 m, 4 xii 2018, *P.M. Gonella* et al. 1081 (MBML); Serra do Padre Ângelo, Pico do Padre Ângelo, no primeiro platô, com presença de velózias gigantes, 19°18'41.24"S, 41°34'30.83"W, 1220 m, 8 vi 2020, *P.M. Gonella* et al. 1206 (MBML, UPCB); Serra do Padre Ângelo, Serra da Palha Branca, acessível a partir do Mirante da Bela Adormecida, 19°20'19.51"S, 41°33'26.26"W, 1080 m, 9 vi 2020, *P.M. Gonella* et al. 1288 (MBML, UPCB); Serra do Padre Ângelo, Boa Vista, crista sul do Pico do Padre Ângelo, 19°19'55.42"S, 41°34'24.82"W, 950 m, 9 vi 2020, *P.M. Gonella* et al. 1346 (MBML, UPCB); Serra do Padre Ângelo, Serra da Palha Branca, Pedra da Antena, aflormanto rochoso com antena no topo, 19°20'41.2"S, 41°32'48.3"W, 1200 m, 19 viii 2020, *P.M. Gonella* et al. 1497 (MBML); afloramento quartzítico próximo a Vista Alegre (distrito de Alvarenga), 19°23'49.6"S, 41°33'26.4"W, 920 m, 4 x 2020, *P.M. Gonella* et al. 1799 (MBML, UPCB); Serra do Padre Ângelo, Pico do Padre Ângelo, primeiro platô, 19°18'45.84"S, 41°34'38.13"W, 1260 m, 14 xi 2020, *P.M. Gonella* et al. 1719 (MBML); Serra do Padre Ângelo, Pico do Padre Ângelo, platô do topo do pico, afloramento da face sul, 19°19'12.78"S, 41°34'42.02"W, 1515 m, 30 xi 2020, *P.M. Gonella & D.P. Cordeiro* 1832 (MBML); Serra do Padre Ângelo, Serra do Pinhão, acima da cachoeira do Diabo, 19°16'22.5"S, 41°34'42.27"W, 990 m, 31 i 2021, *P.M. Gonella* et al. 1991 (MBML, UPCB); afloramento quartzítico próximo a Vista Alegre (distrito de Alvarenga), 19°23'43.98"S, 41°33'33.64"W, 920 m, 1 ii 2021, *P.M. Gonella* et al. 2023 (MBML, UPCB); Serra do Padre Ângelo, Serra do Pinhão, subida para o Pico do Sossego, 19°13'42.77"S, 41°34'22.33"W, 1070 m, 1 v 2021, *P.M. Gonella* et al. 2402 (MBML, UPCB); Parque Estadual de Sete Salões, 19°16'50"S, 41°22'22"W, 833 m, 7 viii 2021, *M.L Brotto & R.R. Völtz* 4410 (MBM).

Pleroma caetanoi is related to the species classically assigned to *Tibouchina* sect. *Pleroma* (D.Don) Cogn. (*sensu* Cogniaux, 1885, 1891), especially to the group of species with the appendages and pedoconnectives of the antesepalous stamens covered by glandular trichomes, and recognised by Meyer *et al.* (2016, 2018) as the "*Pleroma heteromallum* (D.Don) D.Don complex". Within this group, *Pleroma caetanoi* is more closely related to species that have branches that lack wings, leaves that are sessile or with short petioles and have a cordate base, a hypanthium that is covered with glandular trichomes, and a style that is pilose in its lower portion (according to the identification key by Cogniaux, 1885, 1891). Because of the costate fruits, we believe that *Pleroma caetanoi* is closer to *P. decemcostatum*, which also occurs in the state of Minas Gerais. Both species are erect shrubs with ovate leaves, thyrsoid inflorescences with the axis covered with glandular and eglandular trichomes, ovate bracteoles, and the petals purple with a white base. They also have stamens with setulose filaments, the antesepalous ones with the pedoconnectives and appendages covered with glandular trichomes (rarely glabrous in *Pleroma caetanoi*), and pilose style. *Pleroma caetanoi* differs from *P. decemcostatum* by the characters described in the diagnosis, and by the leaves that are pilose on the abaxial surface (versus villose in *P. decemcostatum*).

Pleroma caetanoi also resembles *P. costatocalyx* F.S.Mey., L.Kollmann & R.Goldenb. (Meyer *et al.*, 2016) by its ovate leaves, thyrsoid inflorescences, ovate bracteoles, petals

purple with a white base, stamens with setulose filaments, the antesepalous ones with pedoconnectives and appendages covered with glandular trichomes, pilose style, and costate fruits. *Pleroma caetanoi* differs from *P. costatocalyx* by its shorter petioles, 1.2–3.6 mm long (versus 3.6–11.8 mm long in *P. costatocalyx*), and by its leaves scabrous on the abaxial surface (versus sericeous), with trichomes not forked at the base (versus trichomes several-forked at the base).

Pleroma caetanoi is related to *P. petrophylax* F.S.Mey. & R.Goldenb. This relationship is discussed in the diagnosis and notes for *Pleroma petrophylax*, given below.

Most of the studied specimens of *Pleroma caetanoi* presented flowers with purple petals, but the petals may be white in few specimens (*P.M. Gonella* et al. 970; see **Figure 6**). This same variation in petal colour can also be found in other species of the genus, such as *Pleroma echinatum* Gardner [which includes the synonyms *Tibouchina gardneriana* (Triana) Cogn., with pink or purple petals, and *Tibouchina alba* Cogn., with white petals; according to Guimarães *et al.*, 2019] and *P. boraceiense* (Brade) P.J.F.Guim. & Justino, with purple petals in the state of São Paulo, and white petals in Minas Gerais (Justino *et al.*, 2018).

A photograph of *Pleroma caetanoi* was published by Mello-Silva (2018) while the species had yet to be described. The beautiful image of the Serra do Padre Ângelo in figure 1 includes in the foreground some flowering individuals of *Pleroma caetanoi*.

3. Pleroma miconiifolium F.S.Mey. & R.Goldenb., **sp. nov.**

Pleroma miconiifolium differs from *P. leopoldinense* L.Kollmann & R.Goldenb. by its leaves with shorter petioles, 4.6–9.1 mm long (versus 15–45 mm long in *P. leopoldinense*), pustulate on the adaxial surface (versus pustulate-strigose on the adaxial surface); and stamens in both cycles with the appendages covered with sparse glandular trichomes (versus appendages glabrous in both cycles). – Type: Brazil, Minas Gerais, Santa Rita do Itueto, A.P.A. Municipal Pedra do Paredão, Pedra de Santa Rita, na encosta do topo da pedra, 19°22'22.72"S, 41°21'28.70"W, 1060 m, 6 v 2021, *P.M. Gonella, D.P. Cordeiro, G.A. da Silva, P.R. Bartholomay & L. Medeiros* 2722 (holotype UPCB, isotype MBML). **Figures 7, 8.**

Erect shrubs 1–1.5 m tall, with sympodial growth, moderately branched. *Younger branches* terete, not winged, glabrous; *older branches* terete to quadrangular, not winged, glabrous, and basally decorticant; *nodes* slender. *Leaves* opposite; chartaceous, with distinct petioles, 4.6–9.1 mm long; *blades* 5.2–8.5 × 1.5–3.5 cm, chartaceous, slightly discolorous, elliptic, base obtuse, apex acute, margins smooth or slightly crenulated, 5 acrodromous nerves, the midrib and the first lateral pair slightly suprabasal, basally joined on the abaxial surface by a minute membrane and resulting in a pair of pocket domatia, adaxial surface flat, dark green in dry specimens and in fresh material, sparsely pustulate, the minute trichome-like projections less than 0.1 mm long, unbranched, erect, the base linear, not immersed, not forked, and nested within a tuft of minute, glandular, sessile projections,

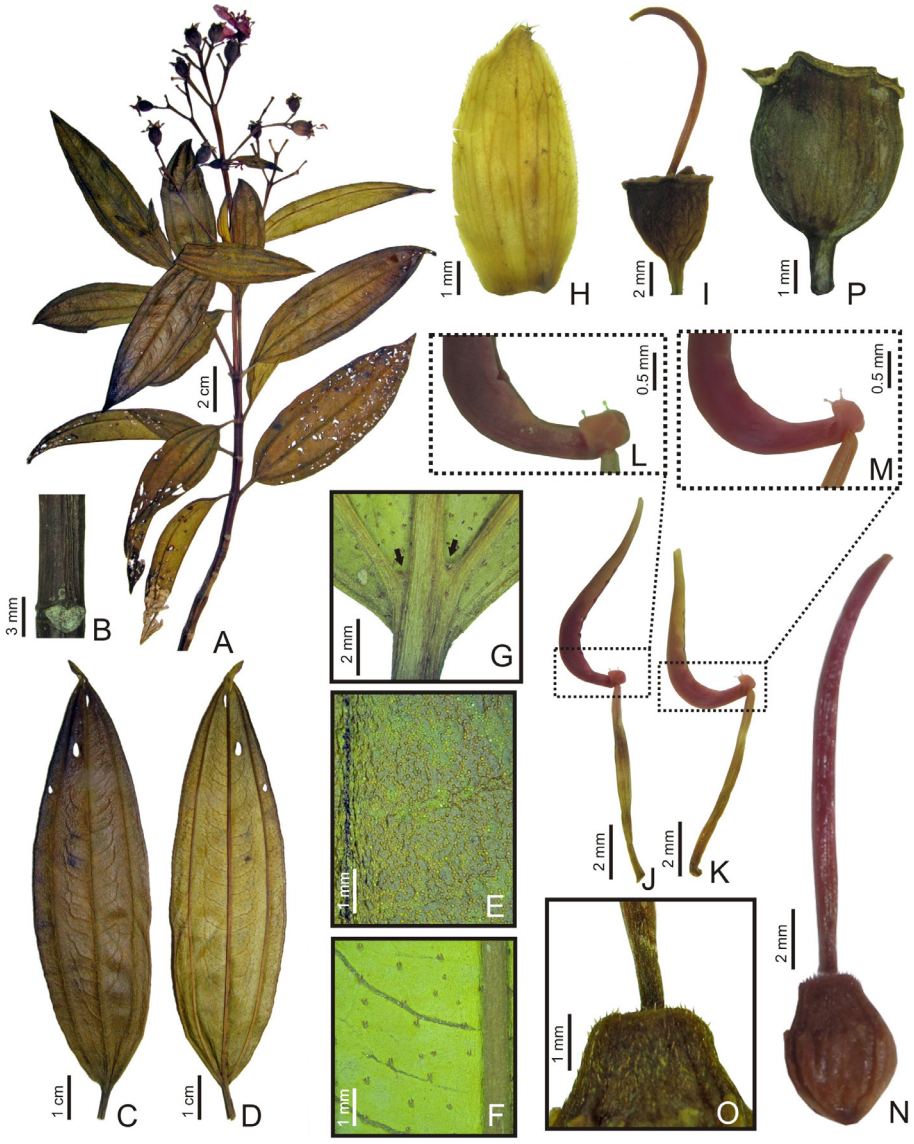

Figure 7. *Pleroma miconiifolium* F.S.Mey. & R.Goldenb., sp. nov. A, Branch with inflorescence; B, surface of a young branch; C, leaf (adaxial surface); D, leaf (abaxial surface); E, detail of the adaxial surface; F, detail of the leaf indumentum (abaxial surface); G, detail of the leaf base (abaxial surface), with the two pocket domatia indicated by arrows; H, bracteole (adaxial surface); I, hypanthium and style in an old flower (the caducous calyx has already fallen at this stage); J, antesepalous stamen; K, antepetalous stamen; L, detail of the connective of the same antesepalous stamen shown in J, with two glandular trichomes attached; M, detail of the connective of the same antepetalous stamen shown in K, with two glandular trichomes attached; N, ovary, detached from the hypanthium; O, ovary apex, with sparse and short trichomes; P, immature capsule. All from the holotype, *Gonella* et al. 2722 (UPCB). Photographs: F. S. Meyer.

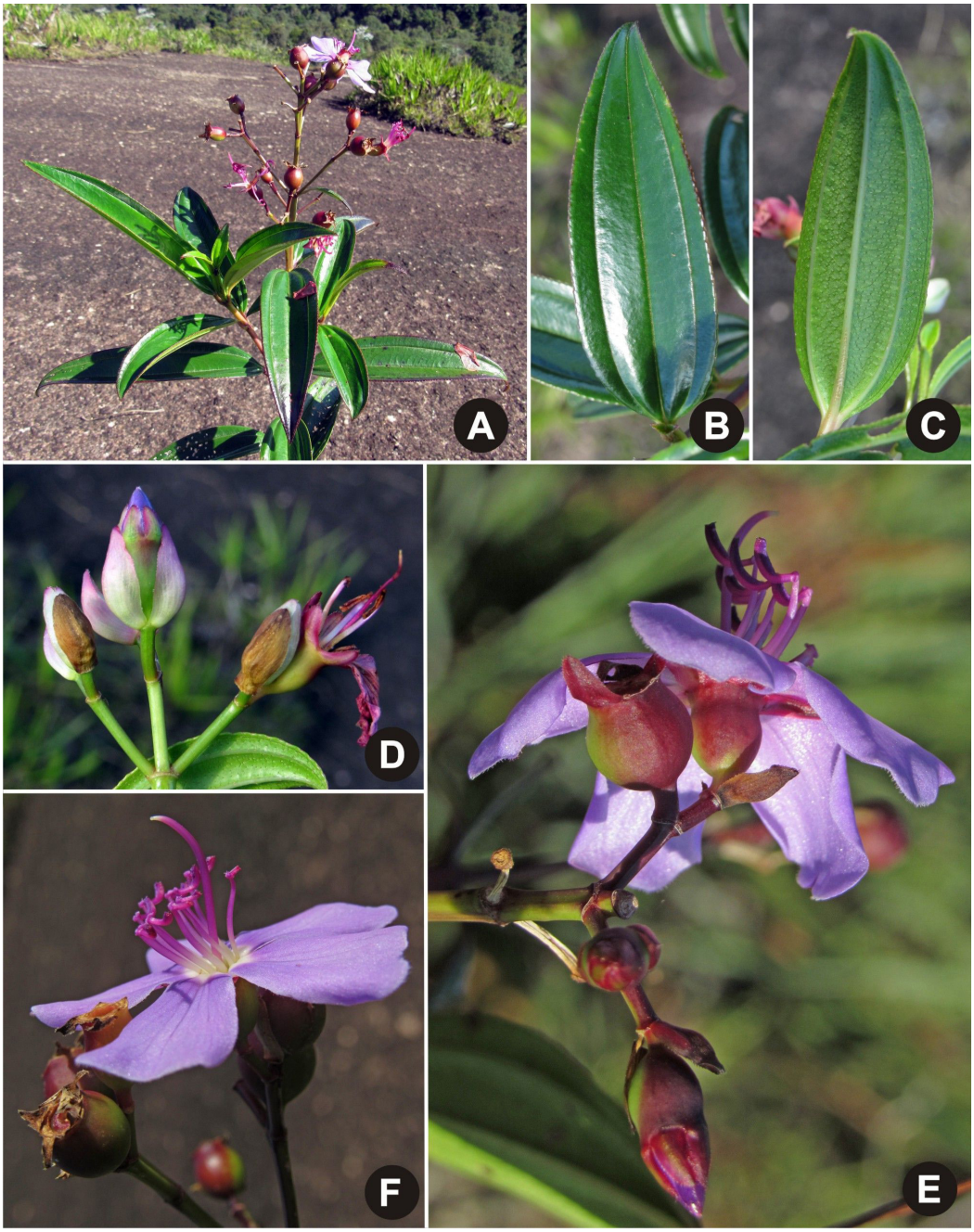

Figure 8. *Pleroma miconiifolium* in the field. A, Plant growing on granitic substrate; B, leaf (adaxial surface); C, leaf (abaxial surface); D, cyme, partial inflorescence; E, partial inflorescence; F, flower with damaged stamens, probably chewed by bees. Photographs: P. M. Gonella.

abaxial surface flat, yellowish green or light brown in dry specimens, light green in fresh material, sparsely strigose on the primary veins, trichomes 0.3–1.3 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked, sparsely strigose on the surface, tertiary and quaternary veins, the minute trichome-like projections 0.1–0.3 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked, and nested within a tuft of minute, glandular, sessile projections. *Thyrsoids* 5–12.5 × 5–8.5 cm, terminal, c.29–51 flowers, axis terete, glabrous, yellowish green to burgundy green; *bracts* late deciduous, leafy, with conspicuous petioles, 2.4–9.5 mm long, blade 39.1–81.3 × 10.8–28.8 mm, elliptic, indumentum the same as on the leaves; *bracteoles* early deciduous, 3.4–8.9 × 1.9–4.2 mm, ovate, apex acute or obtuse, not covering the apex of the flower bud, margins entire, ciliate, both surfaces glabrous. *Flowers* 5-merous, pedicels 1.1–2.2 mm long; *hypanthium* 4.4–6 × 4.3–5 mm, obovate, not costate, sparsely pustulate, trichomes less than 0.1 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked; *sepals* late deciduous, 3–4.1 × 2.2–3 mm, triangular, margins ciliate, apex acute, both surfaces glabrous; *petals* purple with a white base (during anthesis) or purple with a red base (in senescent flowers), 17–18.8 × 9.9–10.9 mm, obovate, apex obtuse or truncate, ciliate; *stamens* 10, slightly dimorphic, antesepalous with the filaments white on its lower half, and purple on its upper half (during anthesis) to totally purple or reddish (in senescent flowers), 7.6–8.4 mm long, glabrous, pedoconnective purple, 0.9–1.3 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex acute or cuspidate, c.0.4 mm long, sparsely setulose, trichomes c.0.3 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, thecae 8–8.2 × 0.9–1.1 mm, falcate, purple, antepetalous with the filaments white on its lower half, and purple on its upper half (during anthesis) to totally purple or reddish (in senescent flowers), 7–7.3 mm long, glabrous or sparsely setulose on its upper half, trichomes c.0.2 mm long, unbranched, glandular, curved to erect, the base linear, not immersed, not forked, pedoconnective purple, 0.5–0.8 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex acute or cuspidate, c.0.3 mm long, sparsely setulose, trichomes c.0.3 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, thecae 7.6–7.8 × 0.7–0.8 mm, falcate, purple; *ovary* 4.5–4.9 × 3.2–3.7 mm, 5-locular, apex sparsely setulose, trichomes 0.1–0.4 mm long, unbranched, eglandular, erect to curved, the base linear, not immersed, not forked; *style* purple, white only in the upper apical portion (during anthesis) and totally purple or reddish (in senescent flowers), 15.3–17 mm long, apex curved, glabrous, stigma truncate. *Capsular fruits* 7.7–9.1 × 5.6–6.7 mm, sepals early deciduous, epicarp undivided when mature, ecostate.

Distribution and habitat. *Pleroma miconiifolium* was collected at the Environmental Protection Area Pedra do Paredão, a granitic inselberg with rupicolous vegetation surrounded by dense forests in the municipality of Santa Rita do Itueto (see **Figure 3**). Individuals matching the morphology of the new species were also photographed at another

inselberg named Palestina (Lucian Medeiros, Santa Rita do Itueto [Minas Gerais], personal communication), in the municipality of Pocrane (around 19°29'44.73"S, 41°38'6.18"W; a distance of 32 km to the west); because these individuals were not collected, we did not include them in the distribution map or conservation assessment. At both sites, the species was found in small populations with scattered individuals. *Pleroma miconiifolium* is rupicolous, growing on shallow pockets of soil over exposed rock at elevations around 1000 m. At the type locality, the species is syntopic with another endemic and recently described species, the bromeliad *Orthophytum santaritense* Leme, S.Heller & Zizka (Bromeliaceae; Leme *et al.*, 2017).

Phenology. Collected and photographed with flowers in April and May.

Proposed IUCN conservation category. Critically Endangered: CR B2ab(iii). Although this species has been collected only once, we avoided considering it Data Deficient (DD), because one of the authors (P.M.G.) had collected the single specimen at Pedra do Paredão. The author's *in loco* assessment found the species to be under severe threat by the same factors listed for the *Pleroma brevicomosum* and *P. caetanoi*, that is, several anthropic activities (fires, motocross, trampling) and co-occurrence with invasive species, all of which occur in a landscape that is already greatly fragmented.

Etymology. The specific epithet, *miconiifolium*, refers to the similarity of the leaves of this species to those of the genus *Miconia* Ruiz & Pav. (Melastomataceae), which often have pocket domatia on their abaxial surface (see Bacci *et al.*, 2016).

Pleroma miconiifolium is morphologically closely related to *P. leopoldinense*; both have leaves with 5 nerves, and with domatia on the abaxial surface at the junction between the main nerves; additionally, the flowers in both have glabrous hypanthia, filaments and styles, and the petals are purple with a white base. *Pleroma miconiifolium* differs from *P. leopoldinense* by the characters described in the diagnosis, and also by its elliptic leaves (versus ovate to ovate-lanceolate leaves in *P. leopoldinense*); weakly dimorphic stamens, the antesepalous with shorter thecae, 8–8.2 mm long (versus strongly dimorphic stamens, the antesepalous with thecae 11.5–12 mm long); and shorter style, 15.3–17 mm long (versus 20–22 mm long).

Pleroma miconiifolium is also related to *P. vimineum* (D.Don) D.Don, both having elliptic, 5-nerved leaves, weakly dimorphic stamens with glabrous pedoconnectives, and glabrous style. *Pleroma miconiifolium* differs from *P. vimineum* by its leaves sparsely pustulate on the adaxial surface (versus moderately strigose in *P. vimineum*), with a pair of domatia on the abaxial surface (versus lacking domatia), sparsely pustulate hypanthia (versus moderately strigose), and glabrous filaments (versus basally moderately setulose).

4. Pleroma petrophylax F.S.Mey. & R.Goldenb., **sp. nov.**

Pleroma petrophylax differs from *P. caetanoi* F.S.Mey. & R.Goldenb. by its leaves with

longer petioles, 6.8–12.6 mm long (versus petioles 1.2–3.6 mm long in *P. caetanoi*), and blade with branched trichomes on the adaxial surface (versus blade with unbranched trichomes on the adaxial surface). – Type: Brazil, Minas Gerais, Conselheiro Pena, afloramento quartzítico próximo a Vista Alegre (distrito de Alvarenga), 19°23'42.30"S, 41°33'26.7"W, 980 m, 1 ii 2021, *P.M. Gonella, D.P. Cordeiro, G.A. da Silva & P.R. Bartholomay* 2083 (holotype UPCB, isotype MBML). **Figures 9, 10.**

Erect shrubs 1.2–1.5 m tall, with sympodial growth, moderately branched. *Younger branches* quadrangular, angulose, moderately to densely setulose, trichomes 0.3–1.6 mm long, unbranched or branched, exclusively eglandular or both glandular and eglandular, curved, the base slightly broadened, not immersed, not forked; *older branches* quadrangular, angulose, with indument similar to younger branches but deciduous, and basally decorticant; *nodes* slender. *Leaves* opposite; chartaceous, with distinct petioles, 6.8–12.6 mm long; *blades* 3.8–6.3 × 2.6–3.8 cm, chartaceous, discolorous, ovate, lacking domatia on the abaxial surface, base cordate, apex acute, margins crenulate, 7 acrodromous nerves, the marginals tenuous, adaxial surface flat, dark green in dry specimens and fresh material, moderately to densely scabrous, trichomes 1–3 mm long, branched, eglandular, curved, the base strongly broadened, not immersed, not forked, abaxial surface flat, light brown in dry specimens and in fresh material, moderately setose on the primary and secondary veins, trichomes 1–2.5 mm long, unbranched or branched, eglandular, curved, the base slightly broadened, not immersed, not forked, densely pilose or densely setulose on the surface, tertiary and quaternary veins, trichomes 0.7–3 mm long, unbranched or branched, eglandular, curved, the base slightly broadened, not immersed, not forked. *Thyrsoids* 5–10 × 5–9 cm, terminal, c.55–120 flowers, axis quadrangular, sparsely to moderately setulose or hirsute, trichomes 0.4–2.2 mm long, unbranched or branched, eglandular or eglandular and glandular mixed, curved to erect, the base linear to slightly broadened, not immersed, not forked, purple to reddish; *bracts* late deciduous, leafy, with conspicuous petioles, 4.9–6.8 mm long, blade 27.5–32.3 × 17.1–23.8 mm, ovate, indumentum the same as on the leaves; *bracteoles* early deciduous, 3.7–5 × 1.7–3.1 mm, ovate, apex acute, not covering the apex of the flower bud, margins entire, ciliate, adaxial surface glabrous, abaxial surface sparsely to moderately setose or setulose, with the indument uniformly arranged along the entire abaxial surface, trichomes 0.2–1.2 mm long, unbranched, both eglandular and glandular, curved, the base linear or slightly broadened, not immersed, not forked. *Flowers* 5-merous, pedicels 1.5–2.7 mm long; *hypanthium* 3.7–4.9 × 2.2–3.7 mm, obovate, not costate, moderately setose, trichomes 0.5–2.2 mm long, unbranched, eglandular or both eglandular and glandular, curved, the base linear to slightly broadened, not immersed, not forked; *sepals* late deciduous, 2–2.5 × 1.6–2.3 mm, triangular, margins ciliate, apex acute, adaxial surface glabrous, abaxial surface with the same trichomes as the hypanthium, but restricted to its central portion; *petals* purple with a white base (during anthesis) or purple with a red

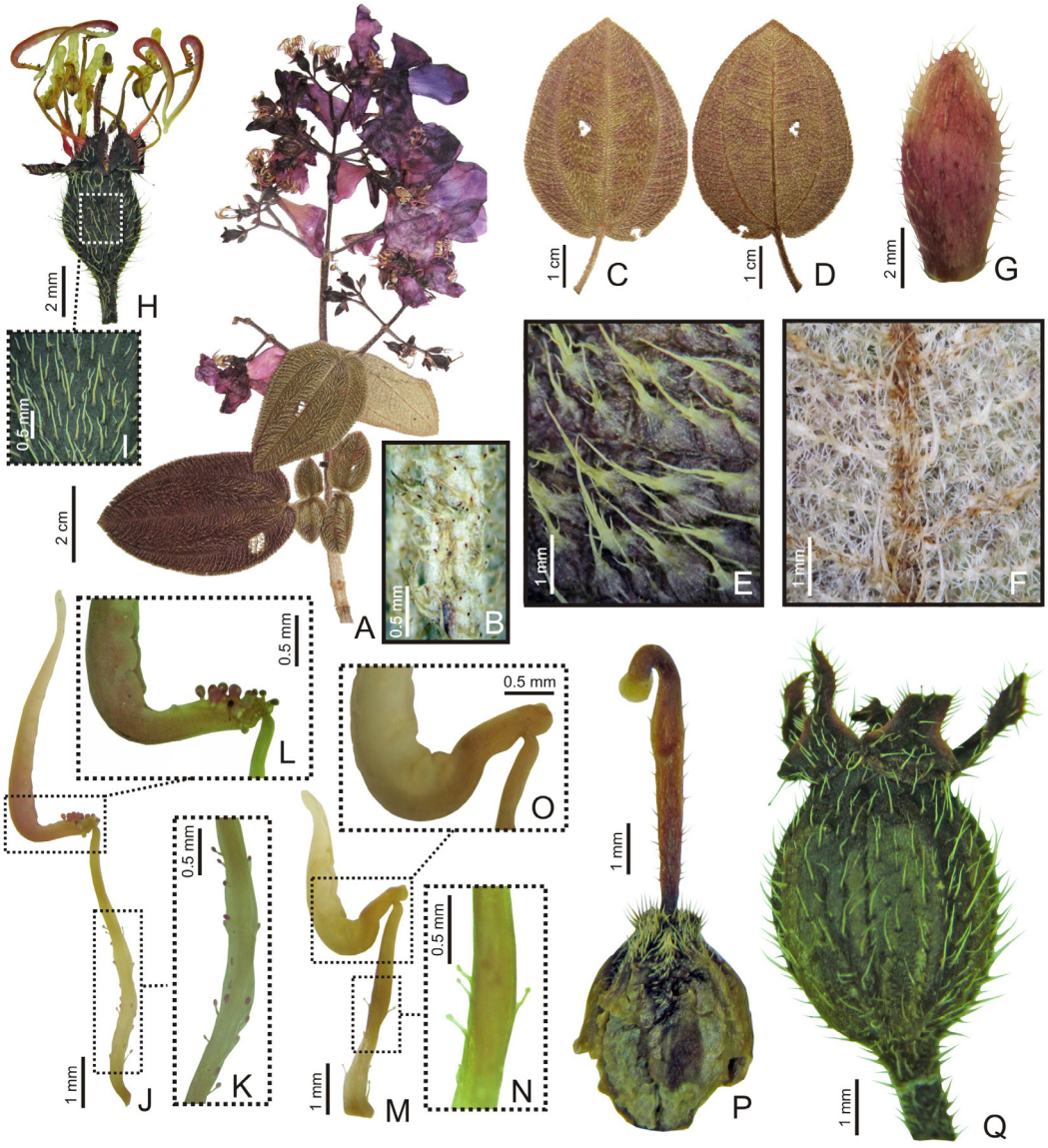

Figure 9. *Pleroma petrophylax* F.S.Mey. & R.Goldenb., sp. nov. A, Branch with inflorescence; B, surface of a young branch; C, leaf (adaxial surface); D, leaf (abaxial surface); E, detail of the leaf indument (adaxial surface); F, detail of the leaf indumentum (abaxial surface); G, bracteole (abaxial surface); H, flower without petals; I, detail of the indument on the hypanthium (abaxial surface); J, antesepalous stamen; K, detail of the setulose filament shown in J; L, detail of the connective and appendages covered with glandular trichomes shown in J; M, antepetalous stamen; N, detail of the setulose filament shown in M; O, detail of the glabrous connective and appendages shown in M; P, ovary and style detached from the hypanthium; Q, immature capsule. All from the holotype, *Gonella* et al. 2083 (UPCB). Photographs: F. S. Meyer.

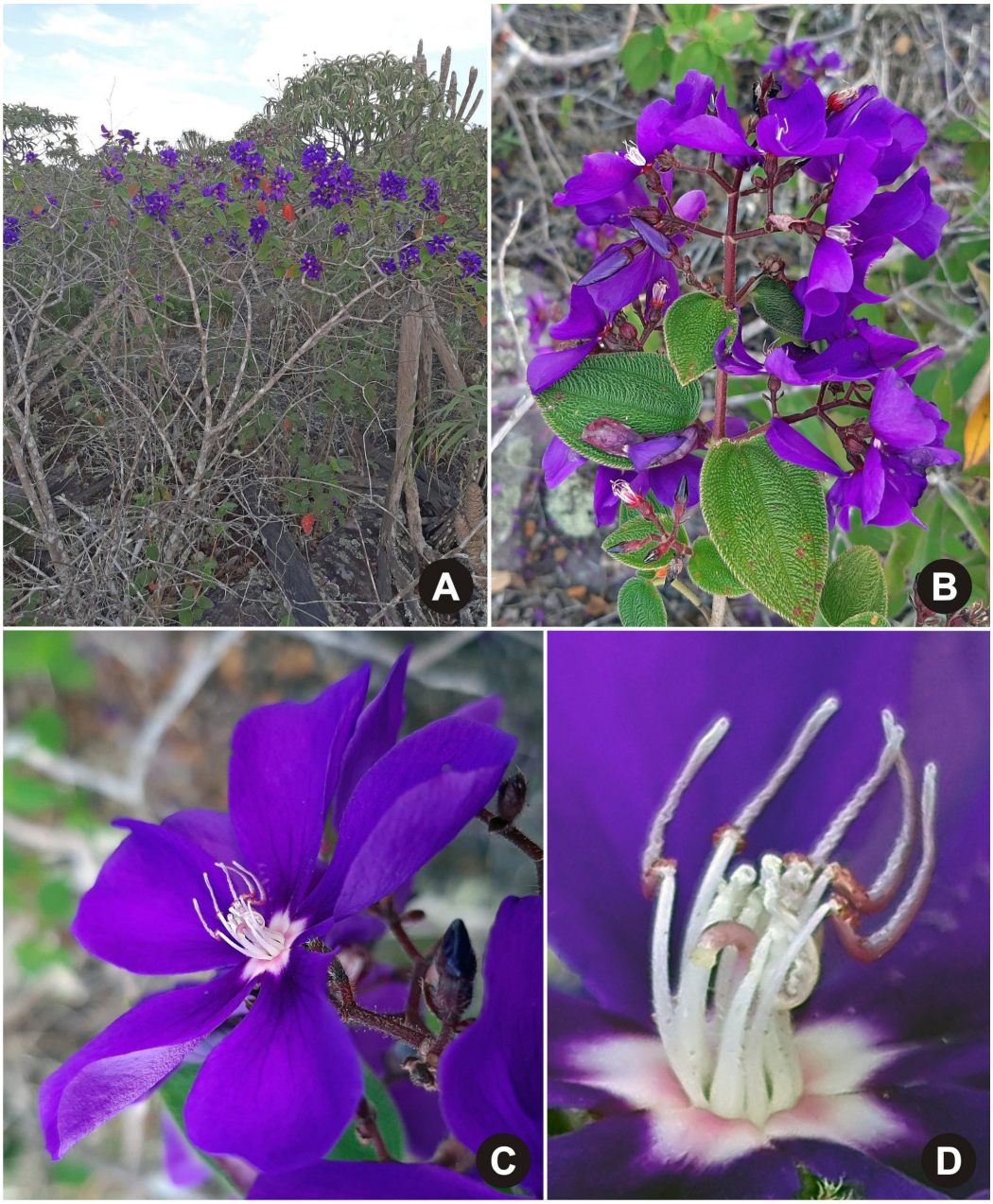

Figure 10. *Pleroma petrophylax* in the field. A, Plant growing on campos rupestres; B, branch with inflorescence; C, flower; D, detail of the stamens and style. Photographs: P. M. Gonella.

base (in senescent flowers), 18.2–26.1 × 16.8–21.8 mm, obovate, apex obtuse or truncate, ciliate; *stamens* 10, strongly dimorphic, antesepalous with the filaments white (during anthesis) to reddish (in senescent flowers), 5.1–5.7 mm long, sparsely setulose on the basal two-thirds, trichomes 0.1–0.3 mm long, unbranched, glandular, curved to erect, the base linear, not immersed, not forked, pedoconnective purple, 0.7–1.1 mm prolonged below the thecae, moderately to densely setulose, trichomes 0.1–0.3 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, ventral appendages bilobed, apex obtuse, c.0.1 mm long, glabrous or moderately setulose, trichomes c.0.1 mm long, unbranched, glandular, erect, the base linear, not immersed, not forked, thecae 5.1–6.2 × 0.4–0.5 mm, falcate, purple, antepetalous with the filaments white (during anthesis) or rosy to reddish (in senescent flowers), 3.7–4.5 mm long, sparsely to moderately setulose on the basal two-thirds, trichomes 0.1–0.3 mm long, unbranched, glandular, curved to erect, the base linear, not immersed, not forked, pedoconnective white, 0.5–0.8 mm prolonged below the thecae, glabrous, ventral appendages bilobed, apex obtuse, c.0.2 mm long, glabrous, thecae 3.9–4.7 × 0.7–0.9 mm, falcate, white; *ovary* 3.4–4.5 × 2.4–3.2 mm, 5-locular, apex densely sericeous, trichomes 0.2–1 mm long, unbranched, eglandular, appressed, the base linear, not immersed, not forked; *style* white (during anthesis) or purple (in senescent flowers), 5.6–6.3 mm long, apex curved, moderately pilose to setulose on the basal two-thirds, trichomes 0.2–0.4 mm long, unbranched, eglandular, curved, the base linear, not immersed, not forked, stigma truncate. *Capsular fruits* 8–8.5 × 5.3–6.4 mm, sepals late deciduous, epicarp undivided when mature, costate.

Distribution and habitat. *Pleroma petrophylax* was collected on both the quartzitic campos rupestres of the João Pinto Formation and on a granitic inselberg (see **Figure 3**). The species was recorded at a small fragment of quartzitic outcrop south of the Serra do Padre Ângelo, near the district of Vista Alegre (municipality of Alvarenga) and at the Environmental Protection Area Pedra do Paredão, a granitic massif in the municipality of Santa Rita do Itueto. At both sites, the populations were very small: only five individuals were observed in the first site, and around 20 at the latter. The species is rupicolous, growing on small pockets of soil over exposed rock at elevations between 705 and 980 m. It is syntopic with *Pleroma caetanoi* and *P. heteromallum* D.Don at the campo rupestre site, and with *Merianthera verrucosa* R.Goldenb., Fraga & A.P.Fontana at the inselberg site.

Phenology. Collected with flowers and fruits in February and May.

Proposed IUCN conservation category. Critically Endangered: CR B2ab(iii). *Pleroma petrophylax* has an AOO of 8 km^2, a severely fragmented distribution, and small subpopulations, and is under the same threats listed above for *P. brevicomosum* and *P. caetanoi*. Although the species was recorded at the Environmental Protection Area at Santa Rita do Itueto (category V of Dudley, 2008), the area where it was found hosted

invasive grasses and is close to areas grazed by cattle. The species is, therefore, assessed as Critically Endangered, based on IUCN criteria (IUCN, 2012).

Etymology. The specific epithet derives from the Greek *pétra* for 'rock', and *phylax*, *phylakos* for 'guardian', 'protector'. It refers to the singular habitat of this new species, the rocky outcrops of the Atlantic Rain Forest, where it remained even after the intense destruction of the vegetation at this biodiversity hotspot.

Additional specimen examined. Brazil. **Minas Gerais**: Santa Rita de Itueto, A.P.A. Municipal Pedra do Paredão, Pedra de Santa Rita, início da trilha para o topo da pedra, 19°22'35.9"S, 41°22'51.5"W, 705 m, 6 v 2021, *P.M. Gonella* et al. 2681 (MBML, UPCB).

Pleroma petrophylax is morphologically related to the species classically assigned to *Tibouchina* sect. *Pleroma* (D.Don) Cogn. (*sensu* Cogniaux, 1885, 1891), especially to the group of species with the antesepalous stamens with appendages and pedoconnectives covered with glandular trichomes [the *P. heteromallum* (D.Don) D.Don complex; see Meyer *et al.*, 2016, 2018]. Within this group, *Pleroma petrophylax* is closer to the species with branches lacking wings, and also with leaves sessile or with short petioles, with a cordate base, the hypanthium covered with glandular trichomes, and the style pilose on its lower portion. Because of the scabrose adaxial surface of the leaves, the costate fruits, and the distribution in the same campos rupestres along the lower Rio Doce, we believe that the closest morphological relative of *Pleroma petrophylax* must be *P. caetanoi*. Both species are erect shrubs with ovate leaves, thyrsoid inflorescences with the axis covered with glandular and eglandular trichomes, ovate bracteoles, petals purple with a white base, and stamens with setulose filaments. *Pleroma petrophylax* differs from *P. caetanoi* by the characters described in the diagnosis, and also by its moderately setose hypanthium (versus moderately to densely sericeous in *P. caetanoi*).

Pleroma petrophylax also resembles *P. decemcostatum* by its ovate leaves, thyrsoid inflorescences, ovate bracteoles, petals purple with a white base, stamens with setulose filaments, the antesepalous with pedoconnectives and appendages covered with glandular trichomes, pilose style, and costate fruits. *Pleroma petrophylax* differs from *P. decemcostatum* by its leaves scabrous on the abaxial surface (versus sericeous in *P. decemcostatum*), with branched trichomes (versus unbranched trichomes).

Pleroma petrophylax is also related to *P. costatocalyx* by its ovate leaves, thyrsoid inflorescences, ovate bracteoles, petals purple with a white base, stamens with setulose filaments, the antesepalous with pedoconnectives and appendages covered with glandular trichomes, pilose style, and costate fruits. *Pleroma petrophylax* differs from *P. costatocalyx* by its leaves scabrous on the abaxial surface (versus sericeous in *P. costatocalyx*), with branched trichomes, not forked at the base (versus unbranched trichomes, several-forked at the base).

Concluding remarks

Species of *Pleroma* abound in both campos rupestres on quartzitic formations (mostly in Minas Gerais and Bahia) and vegetation on granitic inselbergs (mostly in Espírito Santo). The geological conditions in eastern Minas Gerais, where these two substrates form a mosaic (see **Figure 3**), are unique in the sense that several species of *Pleroma* (e.g. *P. petrophylax*) may occur on either one or the other substrate, or even on both. It seems that the geological substrate may be less pivotal than other environmental conditions for the establishment of the species in this genus. A similar phenomenon has been described for the complex including *Pleroma hatschbachii* Wurdack and *P. marumbiensis* Wurdack (Meyer *et al.*, 2009, 2010), with populations occurring on both granitic and quartzitic outcrops in Paraná and São Paulo (Maia *et al.*, 2017a, 2017b, 2018, 2019). In that case, historical processes involving climatic changes and geographical barriers seem to have been more important than the geological substrates in structuring the genetic and morphological features of those populations. This is an interesting subject to investigate in further studies carried out with the aim of explaining the evolution of the vegetation in campos rupestres and inselbergs.

Finally, the impressive number of new species being described for the region, including those listed above, draws our attention to two related subjects. First, it is highly probable that other species on these mountains remain undescribed: for Melastomataceae, for instance, at least three new species are being described. We urge taxonomists working on other families to examine the plants already collected in this area. Second, the region is poorly served in terms of conservation areas and policies. Apart from the Sete Salões State Park, there are several more areas, especially the unprotected Serra do Padre Ângelo and Pico da Aliança, that could be proposed as refugia for the region's endemic species.

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Appendix

Pleroma *specimens used for comparison with the species described in this article*

P. ackermannii (1)
P. australe (2)
P. cordifolium (3)
P. costatocalyx (4)

P. decemcostatum (5)
P. divaricatum (6)
P. leopoldinense (7)
P. mosenii (8)
P. vimineum (9)

Ackermann, G.: *s.n.* [barcode BR0000005224494] (5), 159 (1)

CFCR: 47535 (5)

Emygdio, L.: 3374 (5), 3424 (5)

Glaziou, A.: 3962 [barcodes P05226667, P05226668] (9), 9460 (3), 10770 [barcodes P00376766, P00376767] (3), 14795 [barcodes P05228212, P05228213, P05228214] (5)

Hatschbach, G.: 45028 (1)

Kollmann, L.: 10930 (9), 12512 (4), 12977 (4)

Meyer, F.S.: 1503 (5), 2213 (4)

Mosen, H.: 1972 (8)

Occhioni, P.: 4790 (9)

Raddi, G.: *s.n.* [barcode FI005211] (9)

Regnell, A.F.: III 1527 (8)

Saint-Hilaire, A.G.: *s.n.* [barcode P00116942] (2), D 529 [barcodes P00116942, P00116943, P00116944] (2), 1446 [barcodes P00708655, P00708656, P00708657] (1)