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Research article

Phyllanthus novofriburgensis and *P. pedrosae*, two new species of *Phyllanthus* subsect. *Clausseniani* (Phyllanthaceae) from Southeastern Brazil

Jone Clebson Ribeiro MENDES [1,*], João Marcelo Alvarenga BRAGA [2], Claudio Nicoletti de FRAGA [3] & Sarah Maria ATHIÊ-SOUZA [4]

[1,4] Programa de Pós-graduação em Biodiversidade, Universidade Federal Rural de Pernambuco, 52171−900, Recife, PE, Brazil.
[2,3] Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, 22460−030, Rio de Janeiro, RJ, Brazil.

[*] Corresponding author: jonecmendes5@gmail.com
[2] Email: jmabraga@jbrj.gov.br
[3] Email: cnfraga70@gmail.com
[4] Email: sarah.souza@ufrpe.br

Abstract. *Phyllanthus novofriburgensis* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. and *P. pedrosae* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. are new species of Phyllanthaceae described from the Brazilian Atlantic Forest and Brazilian Cerrado, respectively. *Phyllanthus novofriburgensis* resembles *P. acutifolius* Poir. ex Spreng., *P. hypoleucus* Müll.Arg. and *P. lilliputianus* J.C.R.Mendes, J.M.A.Braga & Fraga, sharing ovate, elliptical, and lanceolate leaf blades. However, it can be distinguished by its pendulous habit, often with sinuous branches and lanceolate leaf blades with characteristically revolute margins. *Phyllanthus pedrosae* exhibits morphological similarities with *P. claussenii* Müll.Arg. due to its subshrubby and prostrate habit. It is distinghuished by the unisexual inflorescence with cymules composed of one or two staminate flowers proximally positioned in the axil of the branches and solitary pistillate flowers distally situated, and the 5-merous calyx in the staminate and pistillate flowers. Both new species are classified in *Phyllanthus* subgen. *Phyllanthus* sect. *Phyllanthus* subsect. *Clausseniani* G.L.Webster, primarily due to the deeply emarginate anthers. Notes on their geographical distribution and habitat are provided, as well as a key to the species of *Phyllanthus* from Southeastern Brazil.

Keywords. Atlantic Forest, Brazilian Cerrado, Neotropics, rocky landscape, taxonomy.

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Introduction

During the last decades, approximately 1270 species were recognized in *Phyllanthus* s.l. (Phyllanthaceae), making it one of the giant pantropical genera of angiosperms, with more than 50 sections and almost 20

subsections (Kathriarachchi *et al.* 2006; Bouman *et al.* 2018). However, with the recent split of the *Phyllanthus* s.l. in 18 genera based primarily on molecular phylogenetic data, the number of species in this genus has been reduced to just over 200 species, mainly occurring in the American continent, distributed into five subgenera, 24 sections and seven subsections (Bouman *et al.* 2022). The newly circumscribed genus *Phyllanthus* is characterized by its phyllanthoid or non-phyllanthoid branching, monochlamydeous flowers without pistillodes, and with a segmented nectariferous disc in staminate flowers and an entire nectariferous disc in pistillate flowers, and seeds differently ornamented (Bouman *et al.* 2022).

Phyllanthus subgen. *Phyllanthus* sect. *Phyllanthus* subsect. *Clausseniani* G.L.Webster is one of the largest subsections, with 26 species, including five species recently described from Brazil (Torres *et al.* 2020; Mendes *et al.* 2021, 2022). This section is characterized by deeply emarginate anthers, distinct and often stipitate thecae, 4-colporate pollen grains, and mostly non-capitate stigmas (Webster 2002; Mendes 2022). However, it is necessary to carry out a molecular phylogenetic study to elucidate the positioning of this subsection, since the *P. claussenii* Müll.Arg. and *P. caparaoensis* G.L.Webster emerged within a clade with neotropical species belonging to sections *Antipodanthus* (G.L.Webster) R.W.Bouman and *Choretropsis* Müll.Arg. (see Kathriarachchi *et al.* 2006; Bouman *et al.* 2021).

In recent years, five new species were discovered in subsection *Clausseniani,* which were all restricted to microhabitats in mountainous regions with altitudes ranging from 1000 to 1600 m and rugged topography where they grow on rocky outcrops or slopes, in litholic or sandy soils (Torres *et al.* 2020; Mendes *et al.* 2021, 2022). In these same environments of rocky outcrops and slopes, two additional species of subsection *Clausseniani* were discovered in the rocky landscape in the Atlantic Forest from Rio de Janeiro and in Cerrado (savanna) from Minas Gerais, both Brazilian states. In this paper, we provide morphological descriptions, illustrations, an identification key for *Phyllanthus* species occurring in Southeastern Brazil, a map with occurrence records, an assessment of the conservation status, and taxonomic notes.

Material and methods

The study was based on the analysis of specimens deposited in the herbaria OUPR, MBML, PEUFR and RB (acronyms according to Thiers 2023), including Mendes's recent collections used as type in this study. Measurements and other traits (e.g., geographic distribution and phenology) provided in the descriptions are based on the analysis of herbarium specimens and on populations studied in the field. The morphological terminology follows Webster (2002) and Beentje (2016). The distribution map was generated in QGis ver. 3.16. (QGIS Development Team 2020). The preliminary conservation status was assessed according to IUCN guidelines and criteria (IUCN 2022) complemented by the online geospatial conservation assessment tool (GeoCat), which was used to calculate the extent of occurrence (EOO) and area of occupancy (AOO), with a user-defined cell of 2 km^2 (Bachman *et al.* 2011).

Results

Taxonomy

Class Magnoliopsida Brongn.
Order Malpighiales Mart.
Family Phyllanthaceae Martinov
Genus *Phyllanthus* L.
Subgenus *Phyllanthus* L.
Section *Phyllanthus* L.
Subsection *Clausseniani* G.L.Webster

Phyllanthus novofriburgensis J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov.
urn:lsid:ipni.org:names:77342725-1
Figs 1A–F, 2–3; Table 1

Diagnosis

Diagnostic characteristics in relation to other species in the subsection: herbaceous to subshrubby habit, 0.6–1 m tall, pendulous. Stem rugose. Leaf blade 10–30 × 5–9.5 mm, lanceolate, base and apex obtuse, apex sometimes mucronate, margin revolute. Staminate pedicel 1.8–2 mm long and pistillate pedicel 3–5 mm long. Staminate disc surface slightly papillose.

Etymology

The specific epithet is based on the type locality.

Type material

Type

BRAZIL – **Rio de Janeiro •** Nova Friburgo, Ponte da Saudade, R. Antiga Linha Férrea, 200 m da Fábrica Ypu, Inselbergue; 22°18′20″ N, 42°31′27″ W; 868 m a.s.l.; 28 Sep. 2021; fl., fr.; *J.C.R. Mendes & J.M.A. Braga 233*; holotype: PEUFR [PEUFR55897!]; isotypes: MBML, RB.

Paratypes

BRAZIL – **Rio de Janeiro •** Nova Friburgo; 14 Feb. 1984; fl.; *E. Costa 258*; RB • ibid.; 1 Oct. 2007; fl., fr.; *L.J.S. Pinto et al. 1142*; RB • ibid.; 28 Oct. 2005; fl., fr.; *L.J.S. Pinto & M.G. Santos 792*; RB • ibid.; 26 Nov. 2004; fl., fr.; *A.F.P. Machado & L.J.S. Pinto s.n.*; RB [412853].

Description

Herb to subshrub 0.6–1 m tall, pendulous, monoecious. Stem cylindrical, rugose, glabrous. Cataphylls present. Branching non-phyllanthoid. Branches erect, sometimes flexuose, cylindrical, rugose, glabrous, pinnatiform; stipules ca 2 mm long, triangular, glabrous. Petiole 2–2.2 mm long, cylindrical, glabrous. Leaf blade 10–30 × 5–9.5 mm, membranaceous, lanceolate; base obtuse; apex obtuse, sometimes mucronate; adaxial and abaxial sides glabrous, adaxial side dark green and abaxial side light green; margin revolute; venation brochidodromous, 8–9 pairs of secondary veins. Inflorescence a simple cyme, axillary, bisexual; cymules with 2 staminate flowers and 1 pistillate flower arranged along the branch; bracts up to 1 mm long, triangular. Staminate flowers with pedicel 1.8–2 mm long; sepals 5, 1.5–2 × ca 1 mm, uniseriate, obovate, apex largely obtuse, glabrous on both sides, whitish, midrib not very evident; glandular disc 5-segmented, alternisepalous, obtriangular, surface slightly papillose; stamens 3, filaments completely free, up to 1.2 mm long; anthers deeply emarginate, with oblique dehiscence; pollen grains 4-colporate. Pistillate flowers with a 3–5 mm long pedicel; sepals 5, 2–2.2 × ca 1 mm, uniseriate, orbicular, apex obtuse, glabrous on both sides, whitish-green, midrib evident; glandular disc entire, cup-shaped, smooth; ovary up to 1 mm in diam., 3-locular, depressed globose; styles 3, free at base, 1–1.5 mm long; stigma 2-fid, descending, subcapitate. Capsules 1.8–2 mm in diam., 6-mericarp, light green, glabrous, calyx and stigma persistent; fruit pedicel 2–2.3 mm long. Seeds 1–1.2 mm long, trigonous; hilum terminal, obtriangular; verrucose ornamentation with regularly arranged stellate ribs; light brown.

Distribution, habitat and phenology

Phyllanthus novofriburgensis sp. nov. is found in the phytogeographic domain of the Atlantic Forest in the city Nova Friburgo, state of Rio de Janeiro, Brazil, growing under rocky walls (inselberg), in altitudinal ranges between 868 and 1267 m (Fig. 3). It was collected with flowers and fruits in September, October and November and only with flowers in February.

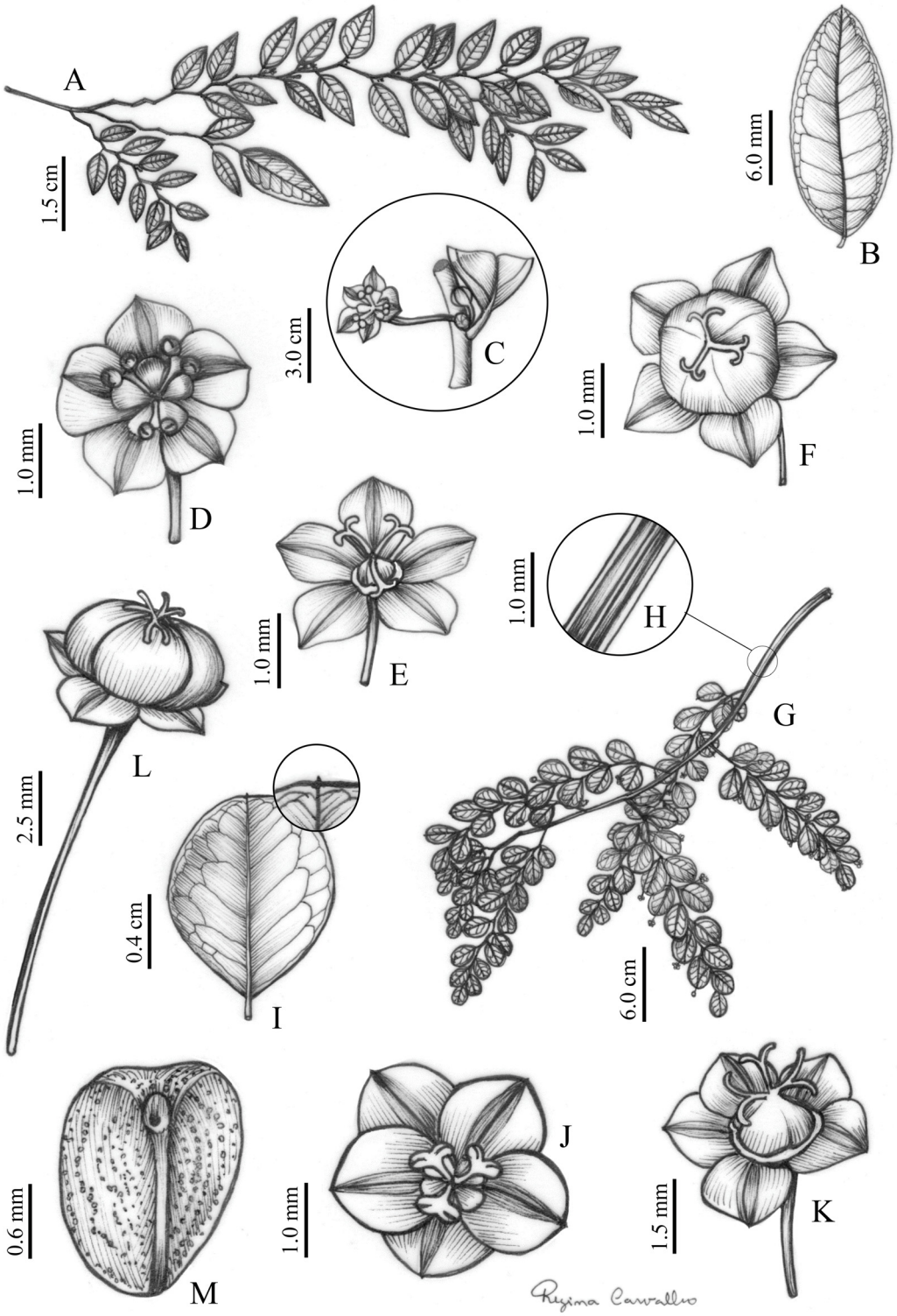

Fig. 1. A–F. *Phyllanthus novofriburgensis* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. **A**. Branches. **B**. Leaf blade. **C**. Cymule. **D**. Staminate flower. **E**. Pistillate flower. **F**. Capsule. **G–M**. *Phyllanthus pedrosae* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. **G**. Branches. **H**. Branch detail [angular]. **I**. Leaf blade [in detail the mucronate apex]. **J**. Staminate flower. **K.** Pistillate flower. **L.** Capsule. **M.** Seed. Illustration designs based on type specimens by Regina Carvalho.

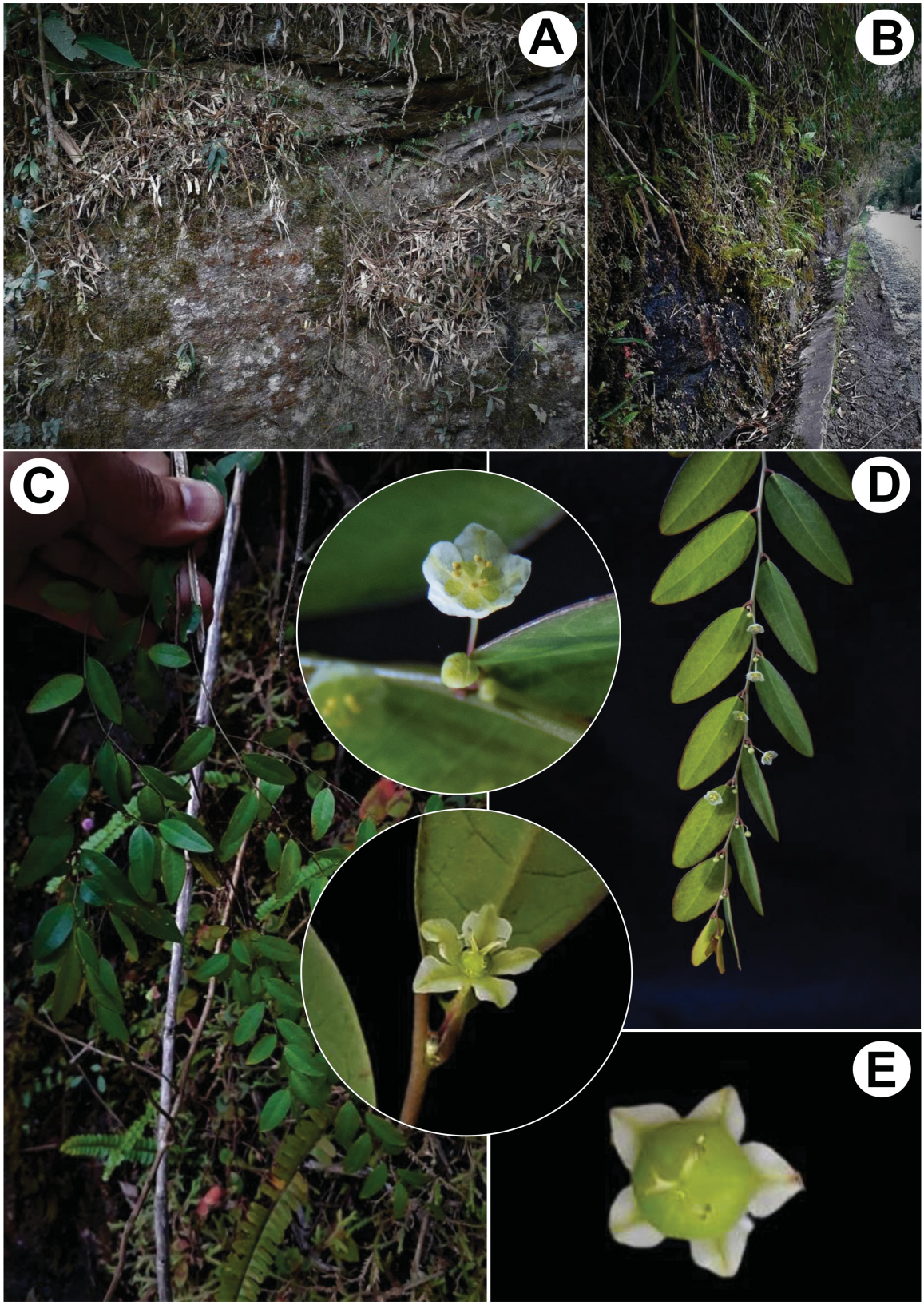

Fig. 2. *Phyllanthus novofriburgensis* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. **A**–**B**. Habitat. **C**–**D**. Branches (in detail the staminate and pistillate flowers). **E**. Capsule. Photos by J.C.R. Mendes (A, B, C, E) and R. Freitas (D with staminate flower detail).

Preliminary conservation assessment

Phyllanthus novofriburgensis sp. nov. falls into the Critically Endangered (CR) category, sub-criterion B1+B2 ab(iii,iv), due its range size (EOO) of 7 km^2 and AOO of 4 km^2. We classified it in this category because the species is restricted to a single rocky wall where an old train line is located. The surrounding area faces intense demographic pressure and anthropization. Consequently, we anticipate an imminent threat to the conservation of *P. novofriburgensis*.

Phyllanthus pedrosae J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov.
urn:lsid:ipni.org:names:77342726-1
Figs 1G–M, 3–4; Table 2

Diagnosis

Diagnostic characteristics in relation to other species in the subsection: subshrubby habit, 1.5–2 m tall, stems and branches angular, smooth. Leaf blade membranaceous, ovate to elliptical, apex mucronate. Cymules axillary, unisexual; staminate flowers 1 or 2 close to the branch axil and solitary pistillate flowers distally positioned. Staminate pedicel 12–13 mm long and pistillate pedicel 8.5–10 mm long. Fruit pedicel 10–12 mm long, capsules 3–5 mm in diam., oblate.

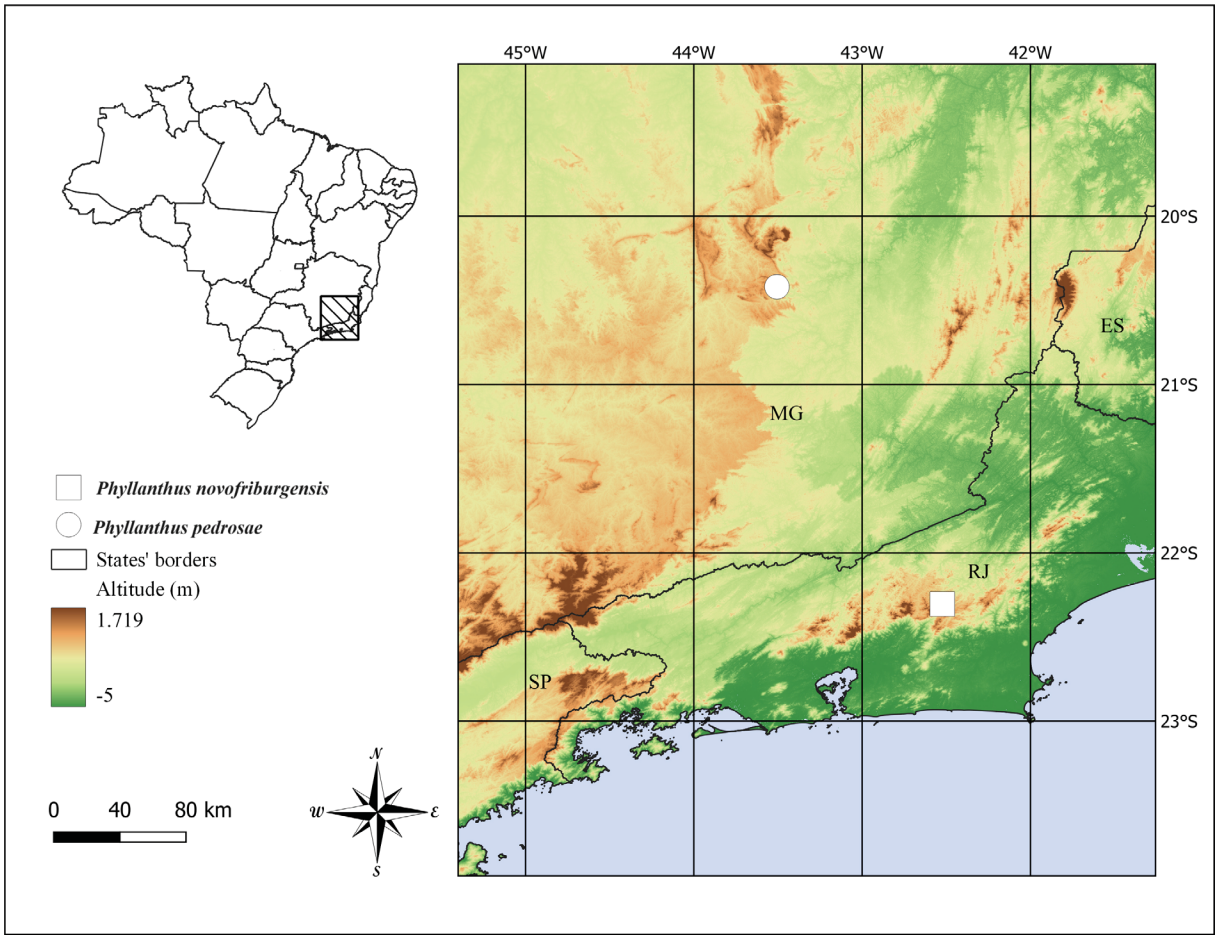

Fig. 3. Distribution map of *Phyllanthus novofriburgensis* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. (white square) and *P. pedrosae* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. (white circle). State abbreviations: ES = Espírito Santo; MG = Minas Gerais; RJ = Rio de Janeiro; SP = São Paulo.

Etymology

The specific epithet is a tribute to Luciano Pedrosa, an independent botanist and great connoisseur of the flora of Minas Gerais, responsible for numerous collections that have contributed to the knowledge of the flora in this region.

Type material

Type

BRAZIL – **Minas Gerais** • Ouro Preto, Parque Estadual do Itacolomi, campo ferrugíneo; 20°25′08″ S, 43°30′24″ W; 1470 m a.s.l.; 3 May 2021; fl., fr.; *J.C.R. Mendes 222*; holotype: PEUFR [PEUFR55853!]; isotypes: OUPR, RB.

Paratypes

BRAZIL – **Minas Gerais** • Ouro Preto; 27 May 1995; fl.; *M.C.T.B. Messias s.n.*; OUPR [1701], PEUFR • same data as for preceding; 1 Nov. 1996; fl., fr.; *M.C.T.B. Messias s.n*; OUPR [6395], PEUFR • same data as for preceding; 16 May 2000; fl.; *M.C.T.B. Messias 350*; OUPR, PEUFR • same data as for preceding; 20 Jun. 2023; fl.; *J.C.R. Mendes et al. 390*; OUPR, PEUFR.

Description

Subshrub 1.5–2 m tall, prostrate, monoecious. Stem angular, smooth, glabrous. Cataphylls present. Branching non-phyllanthoid. Branches erect, angular, smooth, glabrous, pinnatiform; stipules up to 1 mm long, slightly triangular, glabrous. Petiole 1.5–2 mm long, cylindrical, glabrous. Leaf blade 11–16 × 9–11 mm, membranaceous, ovate to elliptical; base cuneate; apex mucronate; adaxial and abaxial sides glabrous, adaxial side dark green and abaxial side light green; margin revolute; venation brochidodromous, 8–9 pairs of secondary veins. Inflorescence a simple cyme, axillary, unisexual; cymules with 1 or 2 staminate flowers close to the branch axil and solitary pistillate flowers distally positioned; bracts up to 1 mm long, triangular. Staminate flowers with pedicel 12–13 mm long; sepals 5, 1.8–2 × ca 2 mm, biseriate, orbicular, apex rounded, glabrous on both sides, pink, midrib evident; glandular disc 5-segmented, alternisepalous, cuneiform, surface glandular; stamens 3, filaments completely free, 0.8–1 mm long; anthers deeply emarginate, with vertical dehiscence; pollen grains 4-colporate. Pistillate flowers with a 8.5–10 mm long pedicel; sepals 5, 1–1.5 × ca 2 mm, biseriate, broadly obovate, apex rounded to slightly obtuse, glabrous on both sides, pinkish to pinkish-green, midrib evident; glandular disc entire, patelliform, smooth; ovary up to 1.8 mm in diam., 3-locular, oval; styles 3, united at base, up to 1 mm long; stigma 2-parted, parallel, subcapitate. Capsules 3–5 mm in diam., oblate, 6-mericarp, dark green, glabrous, calyx and stigma persistent; fruit pedicel 10–12 mm long. Seeds 1.8–2 mm long, trigonous; hilum terminal, ovate; verrucous ornamentation with regularly arranged stellate ribs; dark brown.

Distribution, habitat and phenology

Phyllanthus pedrosae sp. nov. is found in the phytogeographic domain of Cerrado in the city of Ouro Preto, state of Minas Gerais, Brazil, growing on slopes of rocky outcrops, close to watercourses in the Parque Estadual do Itacolomi, in altitudinal ranges between 1470 and 1600 m (Fig. 3). It was collected with flowers and fruits in May and November; and with flowers in May and June.

Preliminary conservation assessment

Phyllanthus pedrosae sp. nov. is categorized as Critically Endangered (CR), sub-criterion B2ab(ii,iv) due to its AOO of 4000 km^2. Although this species has abundant populations and is inserted in the context of a protected area, we believe that the species faces many threats due to the uncontrolled deforestation process in the surroundings of the Parque Estadual do Itacolomi and because the region is heavily visited by tourists.

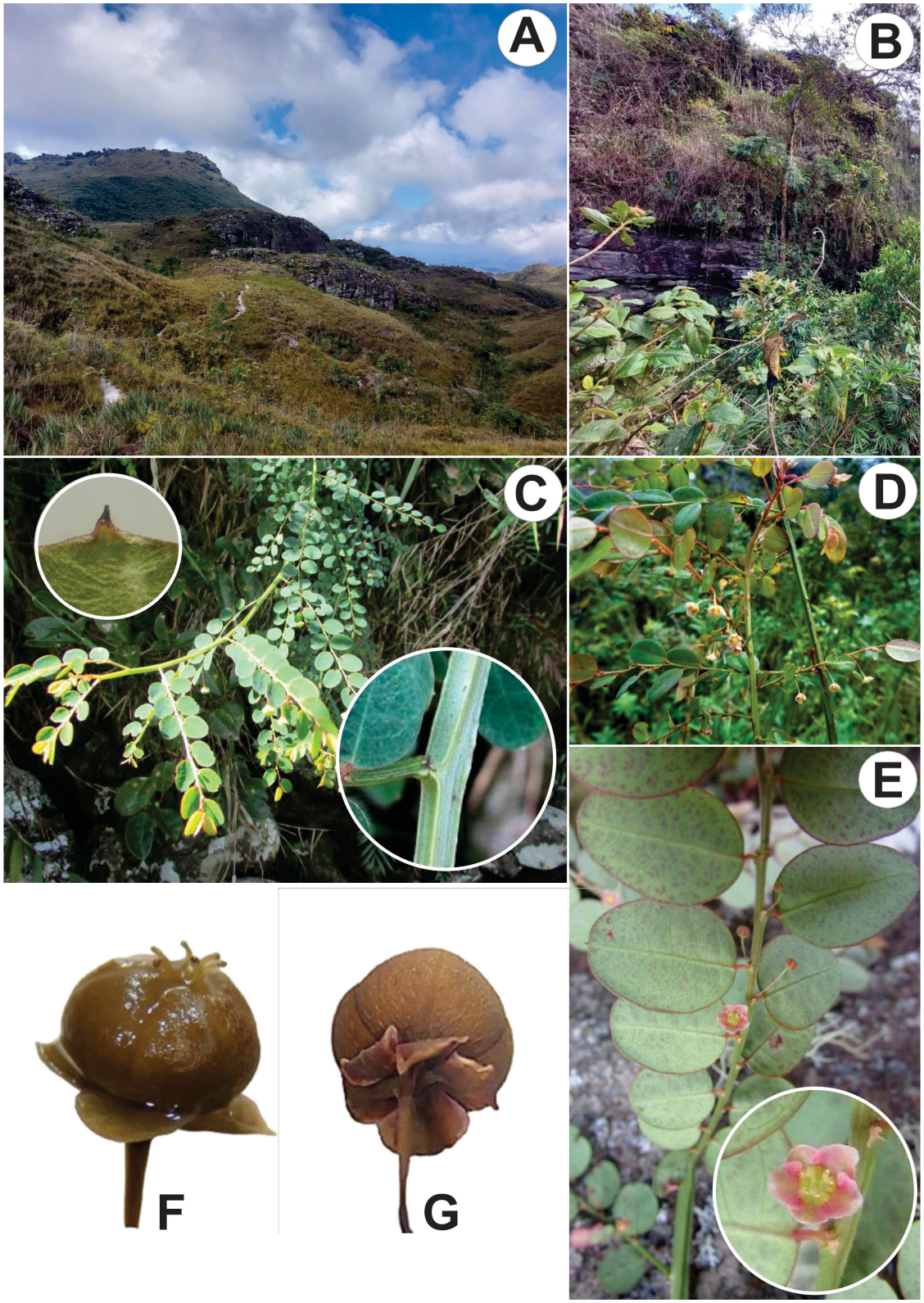

Fig. 4. *Phyllanthus pedrosae* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. **A–B**. Habitat. **C**. Branches (in detail the shape of the branches, as well as the apex of the leaf blade). **D**. Floral branches. **E**. Branches with a staminate flower in detail. **F–G**. Capsule. Photos by J.C.R. Mendes (A–B), L. Pedrosa (C–E) and F–G by M.C.T.B. Messias (OUPR [6395]).

Key to species of Phyllanthus subsect. Clausseniani known from Southeastern Brazil (including two species found in Northeastern Brazil)

1. Stem and branches with trichomes 2
– Stem and branches glabrous 5

2. Branches hirsute 3
– Branches mucilaginous-hyaline 4

3. Leaf blades ovate 5–13 mm long; stamens 3 completely free ..... ***P. arenicola*** Casar.
– Leaf blades elliptical to orbicular 15−30 mm long; stamens 2 completely united ..... ***P. piranii*** G.L.Webster

4. Subshrub 50–80 cm tall, erect; leaf blade ovate-lanceolate, apex attenuate, adaxial surface scabrous; staminate sepals largely elliptical; staminate disk obtriangular with glandular surface; anthers with vertical dehiscence; pistillate sepals obovate to broadly obovate; capsule smooth, pink to reddish or rarely light green ..... ***P. acutifolius*** Poir. ex Spreng.
– Herb 14–30 cm tall, erect; leaf blade elliptical, apex acute to acuminate, adaxial surface sparsely mucilaginous-hyaline; staminate sepals rhombic to widely obovate; staminate disk cuneiform with papillose surface; anthers with oblique dehiscence; pistillate sepals slightly unguiculate; capsule strigose, light green ..... ***P. lilliputianus*** J.C.R.Mendes, J.M.A.Braga & Fraga

5. Branches angular to finely angular-flat 6
– Branches cylindrical 7

6. Branches finely angular-flat; leaf blades 3–10 mm long, broadly elliptic to orbicular, base rounded to truncate, apex rounded sometimes obtuse-mucronate, coriaceous; staminate pedicel and fruit pedicel < 3 mm long. ..... ***P. caparaoensis*** G.L.Wesbter
– Branches angular; leaf blade 11–16 mm long, ovate to elliptical, base cuneate, apex mucronate, membranaceous; staminate pedicel and fruit pedicel ≥ 10 mm long ..... ***P. pedrosae*** sp. nov.

7. Staminate and pistillate flowers with 6 sepals 8
– Staminate and pistillate flowers with 5 sepals 10

8. Stamens 3, connate forming a column ..... ***P. fastigiatus*** Mart. ex Müll.Arg.
– Stamens 3, completely free 9

9. Shrub 100–150 cm tall; leaf blade broadly elliptical to orbicular; staminate disk 6-segmented, obtriangular with faveolate surface; pistillate disc patelliform with alveolate surface ..... ***P. claussenii*** Müll.Arg.
– Subshrub 50–80 cm tall; leaf blade ovate to lanceolate; staminate disc 6-segmented, obovate with verrucose surface; pistillate disc cupuliform with glabrous surface ..... ***P. hypoleucus*** (Miq.) Müll.Arg.

10. Branches fractiflex (zigzag) 11
– Branches sometimes erect or sinuose 12

11. Shrub 80–100 cm tall; leaf blade 2.5–5 × 3–4.5 mm, orbicular to subovate; inflorescence unisexual; staminate sepals biseriate, orbicular; anthers with vertical dehiscence ..... ***P. retroflexus*** Brade
– Herb 30–50 cm tall; leaf blade 15–25 × 10–15 mm, largely elliptical to oval-elliptical; inflorescence bisexual; staminate sepals uniseriate, obovate; anthers with horizontal dehiscence .....***P. sobralii*** J.C.R.Mendes, J.M.A.Braga & Fraga

12. Leaf blade elliptical-falcate or oblong-obovate 13
– Leaf blade broadly elliptical, orbicular, lanceolate or ovate 14

13. Branching non-phyllanthoid; leaf blade elliptical-falcate, base oblique, apex obtuse to rounded; stipules triangular, evident; staminate disc with glandular surface; anthers with vertical dehiscence; pistillate flower pedicel 6–8 mm long ..... ***P. itatiaiensis*** Brade
– Branching phyllanthoid; leaf blade oblong-obovate, base cuneate, apex obtuse-mucronate; stipules narrowly triangular, not evident; staminate disc with smooth surface; anthers with horizontal dehiscence; pistillate flower pedicel 4–5 mm long ..... ***P. mocotensis*** G.L.Webster

14. Leaf blade broadly elliptical to orbicular; staminate disc verruculose .....
..... ***P. subemarginatus*** Müll.Arg.
– Leaf blade lanceolate to ovate; staminate disc tuberculate or papillose 15

15. Staminate disc tuberculate, with a pore in each tubercle .....
..... ***P. tuberculatus*** Marques-Torres & M.J. Silva
– Staminate disc slightly papillose 16

16. Subshrub to shrub, erect; branching phyllanthoid; leaf blade ovate-lanceolate 35–85 × 9–35 mm, base acute, apex acuminate to long-acuminate; stipules 4–5 mm long, narrowly triangular; staminate pedicel 7–8 mm long; fruit pedicel 20–25 mm long; seeds 1.8–2 mm long .....
..... ***P. glaziovii*** Müll.Arg.
– Herb to subshrub, pendulous; branching non-phyllanthoid; leaf blade lanceolate, base obtuse, apex obtuse sometimes mucronate; stipules ca. 2 mm long, triangular; staminate pedicel 1.8–2 mm long; fruit pedicel 2–2.3 mm long; seeds 1–1.2 mm long. ..... ***P. novofriburgensis*** sp. nov.

Discussion

Due to the distinct morphology of the deeply emarginate anthers, distinct and often stipitate thecae, 4-colporate pollen grains, and mostly non-capitate stigmas (see Webster 2002; Mendes 2022), *P. novofriburgensis* sp. nov. and *P. pedrosae* sp. nov. are assigned to the *Phyllanthus* subgen. *Phyllanthus* sect. *Phyllanthus* subsect. *Clausseniani*, which presently includes 26 species exclusively found in Brazil (Torres *et al.* 2020; Mendes *et al.* 2021, 2022).

Phyllanthus novofriburgensis sp. nov. is an easily identifiable species due to its pendulous habit, often with sinuous branches and lanceolate leaf blades with characteristically revolute margin. It exhibits morphological similarity to *P. acutifolius* Poir. ex Spreng., *P. hypoleucus* Müll.Arg., *P. lilliputianus* J.C.R.Mendes, J.M.A.Braga & Fraga, and *P. tuberculatus* Marques-Torres & M.J.Silva, which present ovate, elliptical, and lanceolate leaf blades, but these species are easily distinguished from *P. novofriburgensis* by the characteristics highlighted in Table 1.

Phyllanthus pedrosae sp. nov. can be recognized mainly by its subshrubby habit, angular stems, smooth branches, membranaceous ovate to elliptical leaf blades with mucronate apex, 2-parted stigma, parallel stigmas, and fruit pedicels measuring 10–12 mm. The subshrubby and prostrate habit indicates close affinity with *P. claussenii*, differing mainly in its unisexual inflorescences with cymules composed of 1 or 2 staminate flowers proximally positioned at the axil of the branches and solitary pistillate flowers distally positioned in the branches (vs bisexual inflorescences with 3 cymules, each one with 2–3 staminate flowers and one pistillate flower with an elongated filiform pedicel arranged along the branches in *P. claussenii*) and by the number of sepals (5) in staminate and pistillate flowers (vs 6 sepals in *P. claussenii*). Furthermore, *P. pedrosae* is a species that maintains a certain affinity with *P. subemarginatus* Müll.Arg. and *P. caparaoensis* G.L.Webster, especially because they present 5 sepals in both flowers and occur in

Table 1. Diagnostic comparison between *Phyllanthus novofriburgensis* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. and congeneric species. Abbreviations: BA = Bahia; ES = Espírito Santo; MG = Minas Gerais; RJ = Rio de Janeiro; SP = São Paulo; AF = Altitude Fields; MSSF = Montana Seasonal Semideciduous Forest; DOF = Dense Ombrophylous Forest; ADOF = Altomontana Dense Ombrophylous Forest; REST = restingas.

Morphological character	***P. novofriburgensis* sp. nov.**	***P. acutifolius***	***P. hypoleucus***	***P. lilliputianus***	***P. tuberculatus***
Leaf blade size (mm)	10–30 × 5–9.5	8–20 × 5–12	6–38 × 3–20	15–20 × 8–13	11–20 × 5–8
Leaf blade shape	Lanceolate	Ovate-lanceolate	Ovate, sometimes elliptical	Elliptical	Ovate
Leaf base	Obtuse	Obtuse to rounded	Obtuse to rounded	Cuneate	Rounded
Leaf apex	Obtuse to sometimes mucronate	Attenuate to acute	Acute to acuminate	Acute to acuminate	Acuminate
Leaf margin	Revolute	Revolute-hyaline	Entire	Slightly revolute	Entire
Leaf surface	Glabrous	Scabrous	With papillae	Sparsely mucilaginous-hyaline	Glabrous
Leaf blade consistency	Membranaceous	Membranaceous	Membranaceous	Membranaceous	Chartaceous
Staminate pedicel (mm long)	1.8–2	2.5–3	2–3	2.5–3	7–10
Staminate flower disc	5-segmented, obovate	5-segmented, obtriangular	6-segmented, rounded	5-segmented, cuneiform	5-segmented, obtriangular
Staminate flower disc surface	Slightly papillose	Glandular	Verrucose	Papillose	Tuberculate, with a central pore
Anthers and dehiscence	Deeply emarginate, oblique	Deeply emarginate, vertical	Deeply emarginate, horizontal	Deeply emarginate, oblique	Not-emarginate, horizontal
Staminate and pistillate sepals (respectively)	5, obovate; orbicular	5, largely elliptical; obovate to broadly obovate	6, elliptical or obovate; elliptical to oblanceolate	5, rhombic to widely obovate; slightly unguiculate	5, largely obovate, sometimes elliptical; obovate
Pistillate pedicel (mm long)	3–5	7–8	6–8	3–4	18–20
Pistillate flower disc	Cupuliform	Cupuliform	Cupuliform	Annular	Patelliform
Styles branches (mm long)	1–1.5	0.8–1	0.5–1	0.8–1	Up to 1
Geographic distribution/ habitat	RJ; AF	MG, RJ, SP; AF, MSSF, ADOF	BA; DOF, REST	ES; DOF	BA; DOF

Table 2. Diagnostic comparison between *Phyllanthus pedrosae* J.C.R.Mendes, J.M.A.Braga & Fraga sp. nov. and congeneric species.

Morphological character	***P. pedrosae* sp. nov.**	***P. caparaoensis***	***P. claussenii***	***P. fastigiatus***	***P. subemarginatus***
Stem and branches	Angular, glabrous	Finely angular-flat, scabridulous	Cylindrical, fissured	Cylindrical, rugous	Cylindrical, glabrous to rarely papillose
Leaf shape	Ovate to elliptical	Orbicular	Largely elliptical to orbicular	Elliptical to obovate (± concave)	Ovate, broadly elliptical to orbicular
Leaf blade size (mm)	11–16 × 9–11	3–10 × 1.5–10	13–22 × 6–17	3.5–5 × 1.3–2	12–19 × 9–12
Base of leaf blade	Cuneate	Rounded to truncated	Obtuse	Obtuse to rounded	Obtuse
Apex of leaf blade	Mucronate	Rounded, sometimes obtuse-mucronate	Rounded, sometimes mucronate	Obtuse to acute	Obtuse, sometimes discreetly mucronate
Leaf blade consistency	Membranaceous	Coriaceous	Membranaceous	Subcoriaceous	Membranaceous
Inflorescence (Cymula)	Unisexual	Bisexual	Bisexual	Bisexual	Bisexual
Staminate pedicel (mm long)	12–13	1.5–3	0.2–1	1–2	0.5–3.5
Sepals of staminate flower	5, orbicularis	5, orbicularis	6, elliptical	6, obovate	5, broadly obovate
Staminate flower disc	5-segmented, cuneiform	5-segmented, trapezoids	6-segmented, obtriangular	6-segmented, cuneiform	5-segmented, obtriangular
Disc surface of staminate flowers	Glandular	Glandular	Foveolate	Verrucose	Verrucose
Stamens	3, free	3, free	3, free	3, united, forming a column	3, free
Anthers dehiscence	Vertical	Oblique	Horizontal	Vertical	Horizontal
Pistillate pedicel (mm long)	8.5–10	8–12	1,5–2	1.3–2	4–8.5
Sepals of pistillate flower	5, broadly obovate	5, obovate	6, elliptical-obovate	6 (–5), obovate	5 (–6), obovate
Pistillate flower disc and surface	Pateliform, smooth	Pateliform, smooth	Pateliform, alveolate	Pateliform, smooth	Cupuliform, smooth
Styles (mm long) and stigmas	1–2, 2-parted	1.8–2, 2-fid	0.9–1.3, 2-fid	2–2.5, bifurcate	2–2.3, bifurcate
Fruiting pedicel (mm long)	10–12	1.5–2	1.5–2	2–2.3	0.8–18
Capsule (mm diam.)	3.5–5.3, oblate	2–3, oblate	1–1.5, depressed-globose	3–4, oblate	1.5–2, subglobose

Minas Gerais. *Phyllanthus pedrosae* has the greatest morphological affinity with *P. caparaoensis*; they are the only species in *Phyllanthus* sect. *Phyllanthus* subsect. *Clausseniani* that present angular stems and branches. However, *P. pedrosae* is easily separated from *P. subemarginatus* and *P. caparaoensis* mainly by morphological characteristics such as the shape of the stem and branch, inflorescence, the disc surface of staminate flower, the dehiscence of the anther and the size of the fruiting pedicel, as shown in Table 2. *Phyllanthus pedrosae* is found in the same environment as *P. fastigiatus* Mart. ex Müll.Arg., but the latter is easily recognized by its dense branches at the apex of the stem, elliptical to obovate leaf blades, and 3 connate stamens. Differences between congener species are summarized in Table 2.

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