

Three new species of *Peperomia* Ruiz & Pav. (Piperaceae) from the Brazilian Atlantic Forest

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Abstract

Peperomia (Piperaceae) is a Pantropical genus with approximately 1,700 species, distributed mainly in the Neotropics. In this study, three new species of *Peperomia*, *P. bahiensis*, *P. ilheusensis* and *P. mendanhensis* belong to subg. *Multipalmata* are described for the Brazilian Atlantic Forest. Detailed descriptions, illustrations, distribution maps and an identification key for the species are provided. Keywords: Rio de Janeiro, Bahia, Piperales, Neotropics.

Peperomia (Piperaceae) is a Pantropical genus with approximately 1,700 species, distributed mainly in the Neotropics. In this study, three new species of *Peperomia*, *P. bahiensis*, *P. ilheusensis* and *P. mendanhensis* belong to subg. *Multipalmata* are described for the Brazilian Atlantic Forest. Detailed descriptions, illustrations, distribution maps and an identification key for the species are provided.

Keywords: Rio de Janeiro, Bahia, Piperales, Neotropics.

Introduction

Peperomia Ruiz & Pavon comprises about 1700 species, with Pantropical distribution, mainly concentrated in the Neotropics (Wanke et al. 2006). In Brazil, the genus is represented by 172 species, of which 130 are endemic to the Brazilian Atlantic Forest (Guimarães et al. 2023).

The genus consists of herbs with terrestrial, epilithic or epiphytic habit, often associated with humid areas, near waterfalls, river banks, tree trunks or rocks, and may occasionally occur in rupestrian grassland and dry forests (Carvalho-Silva and Monteiro 2020). They have alternate, opposite or spiral leaves, sessile or petiolate. Its spikes can be axillary or terminal and its flowers have two stamens with long or short filaments. The fruit is a drupe, globose, ovoid or cylindrical, with or without a pseudostem and with a mamillate or rostrate apex.

In addition, some species are cultivated as ornamentals, such as *Peperomia incana* (Haw.) Hook, while others have medicinal uses, such as *P. rotundifolia* (L.) Kunth, whose leaves are used in infusion for stomachaches (Di Stasi et al. 2002), or even for culinary purposes, like *P. pellucida* (L.) Kunth (Van Den Berg 1993).

Currently, based on morphological and molecular data, *Peperomia* has an infrageneric classification consisting of 14 monophyletic groups, of which 13 are easily recognized by morphological characters (Frenzke et al. 2015). *Peperomia* subg. *Multipalmata* Scheiris & Frenzke includes prostrate or erect plants, glabrous or hairy, with roots at the nodes, alternate leaves, short or long petioles, cordate, ovate to orbicular blades, succulent to membranous, sometimes peltate or subpeltate, rarely non-peltate, with a cordate, truncate, obtuse, or rounded base, and an acute or acuminate apex. The palmate venation typically exhibits 3–5 main veins,

often prominent. The solitary spike inflorescence is occasionally paniculate, with peltate floral bracts, and the ovary and fruit are often globose.

Based on morphological characters, three new species of *Peperomia* from subg. *Multipalmata* are described for the Brazilian Atlantic Forest. Detailed descriptions, illustrations, distribution maps and an identification key for the species are provided.

Material and methods

The new species describe here, were collected during a field expedition carried out in 2022 in Mandanha mountains, State of Rio de Janeiro, and from the consultation of samples from the south of the State of Bahia that are deposited in the RB herbarium. Additionally, a bibliographic search was carried out, accompanied by consultation of the following herbaria: CEPEC, HB, R, RB, RBR and RFFP (acronyms according to Thiers 2023 [continuously updated]). High-resolution images, available in the CRIA (2023) and REFLORA (2023) online databases were also analyzed. The distribution map was elaborated on QGIS Desktop version 2.16.3 (<http://qgis.osgeo.org>).

Results and discussion

Key to the three new species and morphologically similar specie

1. Plant with stem and petioles glabrous 2
- 1'. Plant with multicellular heteromorphic trichomes on the stem and petioles
P. ilheusensis
2. Leaf blade ciliated or with unicellular trichomes, aligned or scattered near the margin of the adaxial surface 3
- 2'. Leaf blade eciliate or devoid of trichomes aligned or scattered near the margin of the adaxial surface
P. serpentarioides
3. Reptant plant, petiole 6–14.5 cm long; peduncle 5.5–6 cm long; leaf blade glabrous
P. mendanhensis
- 3'. Rhizomatous plant; petiole 19–23.5 cm long; peduncle 20–24.5 cm long; leaf blade with trichomes on both surfaces
P. bahiensis

Peperomia bahiensis L.C. Silva & E.F. Guim. sp. nov.

(Figs. 1 k–n, 2)

Diagnosis

Peperomia bahiensis resembles *Peperomia serpentarioides*, differing by having trichomes on both surfaces of the leaves, which have ciliate margins, subpeltate blade, with basal margins overlapping the petiole, leaves apices shortly acuminate; petioles 14–23.5 cm long; peduncles 8–18.5 cm long; spikes with scattered flowers, and floral bracts elliptical with irregular margins.

Type: BRAZIL. Bahia: Itaimbé, Rod. Itaimbé/Itapebí, 13 May 1970, fl. and fr., T.S. dos Santos 788 (holotype: RB219752! isotype: CEPEC5771!).

Etymology

The specific epithet refers to type locality, the Bahia State, Brazil.

Description

Herb 30–40 cm tall, terrestrial or epiphitic, rhizomatous, without roots at nodes. Stem striated, grooved, cylindrical, not prostrate, glabrous. Leaves alternate, petiolate; petiole 19–23.5 cm long, cylindrical, striated, glabrous; leaf blade 6–14 × 3.8–11.5 cm, membranous, discolors, ovate, peltate, cordate base, open sinuses, discontinuous, lobes at the base overlapping the petiole in adaxial view, apex shortly acuminate, pilose with trichomes on the adaxial surface; midrib not grooved, unicellular trichomes scattered or absent on the marginal nerves of the abaxial surface, pilose with hirtous trichomes on the adaxial surface; midrib not grooved, scattered unicellular trichomes on the marginal nerves of the abaxial surface, margin revolute, ciliate, with brownish idioblasts; venation acrodromous-campylodromous, 7–11 veins, 3 median veins reaching the apex, others connecting to secondary veins forming arches that converge apically. Inflorescence in a spike, 8–18.5 × 0.2–0.3 cm, terminal, erect; peduncle 20–24.5 cm long, glabrous, without bracts; rachis striated, glabrous; scattered flowers; floral bract elliptic-lanceolate, with idioblasts, margin irregular. Fruits 0.5–0.7 × 0.3–0.5 mm, young, ovate, truncated, globose, glabrous, idioblasts present, apex mamilliform, rounded, apical stigma, not fringed.

Additional specimens examined (Paratypes): BRAZIL. Bahia: Itaimbé, 25 Nov 1970, fl. and fr., L. E. de M. Filho 2922 (CEPEC, R).

Distribution and habitat

Known from two records collected in the municipality of Itaimbé, Bahia State, Brazil. According to the information available on the label of the holotype (T.S. dos Santos 788), *P. bahiensis* was found in an unspecified field area by the collector (Fig. 3). Flowering and fruiting observed in May and November.

Similar species

Peperomia bahiensis is similar to *Peperomia serpentarioides*, but differs from it by having leaf blades with trichomes on both surfaces (versus leaf blade glabrous on both surfaces); margin ciliate (versus margin eciliate); subpeltate, with the basal margin of the blade overlapping the petiole (versus non-peltate, basal margin of the blade not overlapping the petiole); petiole 14–23.5 cm long (versus petiole 6–8 cm long); peduncle 20–24.5 cm long (versus peduncle 8–9 cm long); spikes with sparse flowers (versus spikes with dense flowers); and floral bracts elliptical with margin irregular (versus floral bracts rounded, peltate with margin regular) (Table 1).

Peperomia ilheusensis L.C. Silva & E.F. Guim. sp. nov. (Figs. 1 f–j, 4)

Diagnosis

Peperomia ilheusensis resembles *Peperomia serpentarioides*, but differs by having a subpeltate leaf blade with apex acute-acuminate, and the presence of multicellular heteromorphic trichomes on the stem and on the veins of the abaxial surface of the leaves.

Type: BRAZIL. Bahia: Ilhéus, Banco Central, plantação de cacau. 15 Mar 1972, fl. and fr., S.P. Raimundo 1150 (holotype: RB219751!).

Etymology

The specific epithet refers to type locality, municipality of Ilhéus, Bahia State, Brazil.

Description

Herb 15–40 cm tall, terrestrial, rhizomatous without roots at nodes. Stem grooved, cylindrical, not prostrate, with heteromorphic trichomes. Leaves alternate, petiolate leaves; petiole 5–15 cm long, cylindrical, striated, pilose at the apex and becoming glabrescent towards the base; leaf blade 9–9.5 × 8–8.5 cm, membranous, discolors, ovate, subpeltate, base cordate, open continuous sinuses, rounded, not overlapping the petiole, apex acute-acuminate, glabrous on the adaxial surface; midrib grooved with trichomes multicellular, rare

and sparse ones on the abaxial surface, margin revolute, eciliate, densely covered with white idioblasts; venation acrodromous-campylodromous, 7–9 veins, 3 median veins reaching the apex, others connecting to secondary veins, forming arches that converge apically. Inflorescence in a spike, 2.4–2.5 cm × ca. 0.1 mm, terminal, erect; peduncle 9.5–10 cm long, glabrous, unbranched; rachis striated, glabrous; scattered flowers; floral bract peltate, rounded, with idioblasts, margin irregular. Fruits ca. 0.4 × 0.2 mm, young, rounded, idioblasts present, apex mamilliform; apical stigma, not fringed.

Distribution and habitat

Known only from the type locality, in the municipality of Ilhéus, Bahia state. According to the information available on the label of the exsiccate, *P. ilheusensis* was found in the understory, near a cocoa plantation (Fig. 3). Flowering and fruiting observed in March.

Similar species

Peperomia ilheusensis is similar to *Peperomia serpentarioides*, but differs by having a subpeltate leaf blade with acute-acuminate apex (versus non-subpeltate leaf blade with apex acute); and the presence of heteromorphic trichomes on the stem and veins of the abaxial surface of the leaf blade (versus stem and veins glabrous on the abaxial surface of the leaf blade). In addition, the petiole is pilose (versus glabrous); and the flowers are sparse (versus dense flowers) (Table 1).

Peperomia mendanhensis L.C. Silva, E.F. Guim. & G.A. Queiroz sp. nov. (Fig 1 a-e, 5)

Diagnosis

Peperomia mendanhensis resembles *Peperomia serpentarioides*, but differs by having reptant roots; leaf blade with one row of unicellular trichomes, aligned and scattered, near the margin of the adaxial surface, apex long acute-acuminate; peduncle 5.5–6 cm long, and scattered flowers.

Type: BRAZIL. Rio de Janeiro: Nova Iguaçu, Serra do Mendanha, Estrada da Torre, próximo a nascente na trilha Curva da Bica, 28 Octo 2022, fl. and fr., L.C.C. da Silva et al. 50 (holotype: RB842516!).

Etymology

The specific epithet refers to the type locality, the Mendanha mountains, in Rio de Janeiro State, Brazil.

Description

Herbs 30–40 cm tall, terrestrial, reptant with roots at nodes. Stem striated, slightly grooved, cylindrical, prostrate, glabrous. Leaves alternate, petiolate; petiole 6–14.5 cm long, cylindrical, striated, glabrous; leaf blade 8.5–11.5 × 5–7.3 cm, membranous, discolors, ovate, peltate to subpeltate, base shortly cordate, open continuous sinuses, not overlapping the petiole, apex long acute-acuminate, glabrous on both surfaces, except for a row of unicellular trichomes, aligned and scattered near the margin of the adaxial surface, margin revolute, eciliate, densely covered with yellowish idioblasts; venation acrodromous-campylodromous, 7–10 veins, 3 median veins reaching the apex, others connecting to secondary veins, forming arches that converge apically. Inflorescence in a spike, 5.5–7 × 0.3–0.4 cm, terminal, erect, rarely paniculate, greenish-white; peduncle 5.5–6 cm long, glabrous, unbranched, wine; rachis striated, sparsely pilose; flowers scattered; floral bract peltate, rounded, idioblasts absent, papillose, margin irregular. Fruits 0.2–0.3 × ca. 0.1 mm, ovate, globose, glabrous, idioblasts present, apex mamilliform, not rostrate; stigma apical, fringed.

Distribution and habitat

Known only from the type locality, in the Rio de Janeiro State. *Peperomia mendanhensis* was found in the understory of the Atlantic Forest, growing and forming populations in shady and humid areas (Fig. 3). Flowering and fruiting observed in October.

Similar species

Peperomia mendanhensis is similar to *Peperomia serpentarioides*, but differs by having reptant roots (versus roots rhizomatous); leaf blade with one row of unicellular trichomes, aligned and scattered near the margin of the adaxial surface (versus adaxial surface glabrous); apex long, acute-acuminate (versus acute); peduncle 5.5–6 cm long (versus 8–9 cm long), and sparse flowers (versus dense flowers) (Table 1).

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Table

Species	<i>P. bahiensis</i>	<i>P. ilheusensis</i>
Habit	Rhizomatous	Rhizomatous
Stem	Glabrous	Pilose with heteromorphic trichomes
Petiole	19–22.2 cm long	5–15 cm long
Leaf blade	Pilose on the both faces, margin ciliate	Glabrous on the adaxial surface, pilose with heteromorphic trichomes
Peduncle	20–24.5 cm long	9.5–10 cm long
Inflorescence	8–18.5 × 0.2–0.3 cm	2.4–2.5 × ca. 0.1 cm

Table 1. Morphological comparison between the new species, *Peperomia bahiensis*, *P. ilheusensis*, *P. mendanhensis* and *P. serpentarioides* Miq.









