

New records of *Peperomia armondii* Yunck, *Peperomia hispidula* (Sw.) A. Dietr., and *Peperomia mandioccana* Miq. for the state of Espírito Santo, southeastern Brazil

Valderes Bento Sarnaglia Junior^{1*}, Elton John de Lírio¹, Joelcio Freitas² and Elsie Franklin Guimarães¹

1 Instituto de Pesquisas Jardim Botânico Rio de Janeiro, Rua Pacheco Leão, 915, Jardim Botânico, CEP 22460-030, Rio de Janeiro, Brazil

2 Centro Universitário Norte do Espírito Santo – CEUNES/UFES, Rodovia BR 101 Norte, km. 60, Bairro Litorâneo, CEP: 29932-540, São Mateus, Espírito Santo, Brazil

* Corresponding author. E-mail: valderesbento@yahoo.com.br

Abstract: We present here the first record of *Peperomia armondii*, *P. hispidula* and *P. mandioccana* for the state of Espírito Santo, Brazil. Taxonomic comments, a distribution map and images of these species are presented.

Key words: Piperaceae, Atlantic Forest, geographic distribution

Peperomia Ruiz & Pav. is a pantropical genus holding about 1,600 species, and regarded as one of the largest genera of flowering plants (Frodin 2004; Samain et al. 2009). Its species preferentially inhabit moist and shady places within rainforests (Carvalho-Silva and Guimarães 2008) and are characterized by a terrestrial, epiphytic or rupicolous herbaceous habit. *Peperomia* spp. have alternate, opposite to verticillate leaves, inflorescences in spikes, small and numerous flowers with one pistil and two lateral stamens and protected by a peltate bract, and drupe fruits (Yuncker 1974). In Brazil, 162 species are recorded, with most of them being restricted to the Atlantic Forest (138 species). In Espírito Santo state, 48 species are found and four of them are endemics (Guimarães et al. 2013).

Espírito Santo state was entirely covered by the Atlantic Forest and just 11% of its original forest coverage still remains (SOS Mata Atlântica 2011). Several studies show high species richness for several taxa in this state, as for tree species (Thomaz and Monteiro 1997), Bromeliaceae (Wendt et al. 2010), Malpighiaceae (Almeida and Mamede 2014) birds (Simon 2000), lepidoptera (Brown Jr. and Freitas 2000) and non-volant mammals (Passamani et al. 2000). Werneck et al. (2011) showed a high level of endemism in Espírito Santo and called attention to biological importance of the state.

This study results from fieldwork and herbaria research within the “Flora do Espírito Santo” project and focuses

on the family Piperaceae. The first records for three species in the state of Espírito Santo are presented (*Peperomia armondii* Yunck., *P. hispidula* (Sw) A. Dietr., and *P. mandioccana* Miq.) along with a distribution map and images of these species.

Peperomia armondii

Peperomia armondii is characterized by rupicolous or epiphytes herbs, stoloniferous, decumbent, with villous stems and leaves (Figure 1) (Yuncker 1966; Zanotti and Biganzoli 2010). It was originally described for the states of Santa Catarina, Rio de Janeiro and Bahia (Yuncker 1966), and was cited in “The Piperaceae of Brazil” (Yuncker 1974) and “Flora Ilustrada Catarinense” (Guimarães et al. 1984) with that same material examined. Zanotti and Biganzoli (2010) extended its distributional range to Misiones, Argentina. Guimarães and Carvalho-Silva (2012) reported this species from the state of São Paulo, and Guimarães et al. (2013) extended its distribution for states of Minas Gerais, Paraná and Rio Grande do Sul, excluding Santa Catarina.

This species was found (Figure 2) into two locations, both within Conservation Units in Vitória’s Metropolitan Area (state of Espírito Santo): Área de Proteção Ambiental Mestre Álvaro (municipality of Serra) and Reserva Biológica de Duas Bocas (municipality of Cariacica).

SPECIMENS EXAMINED: Brazil: Espírito Santo: Cariacica, REBIO Duas Bocas, 20 October 2008, fl. *L. Kollmann 11218* (RB, MBML); Serra, APA Mestre Álvaro, 23 January 2013, fl. fr., *V. B. Sarnaglia Junior et al. 571* (RB); Serra, APA Mestre Álvaro, 75 m elevation, 23 January 2013, fl., *V. B. Sarnaglia Junior et al. 572* (RB).

Peperomia hispidula

Peperomia hispidula is characterized by the ovate to rhombic leaves, hispid hairs, stipitate, and by stylose fruits

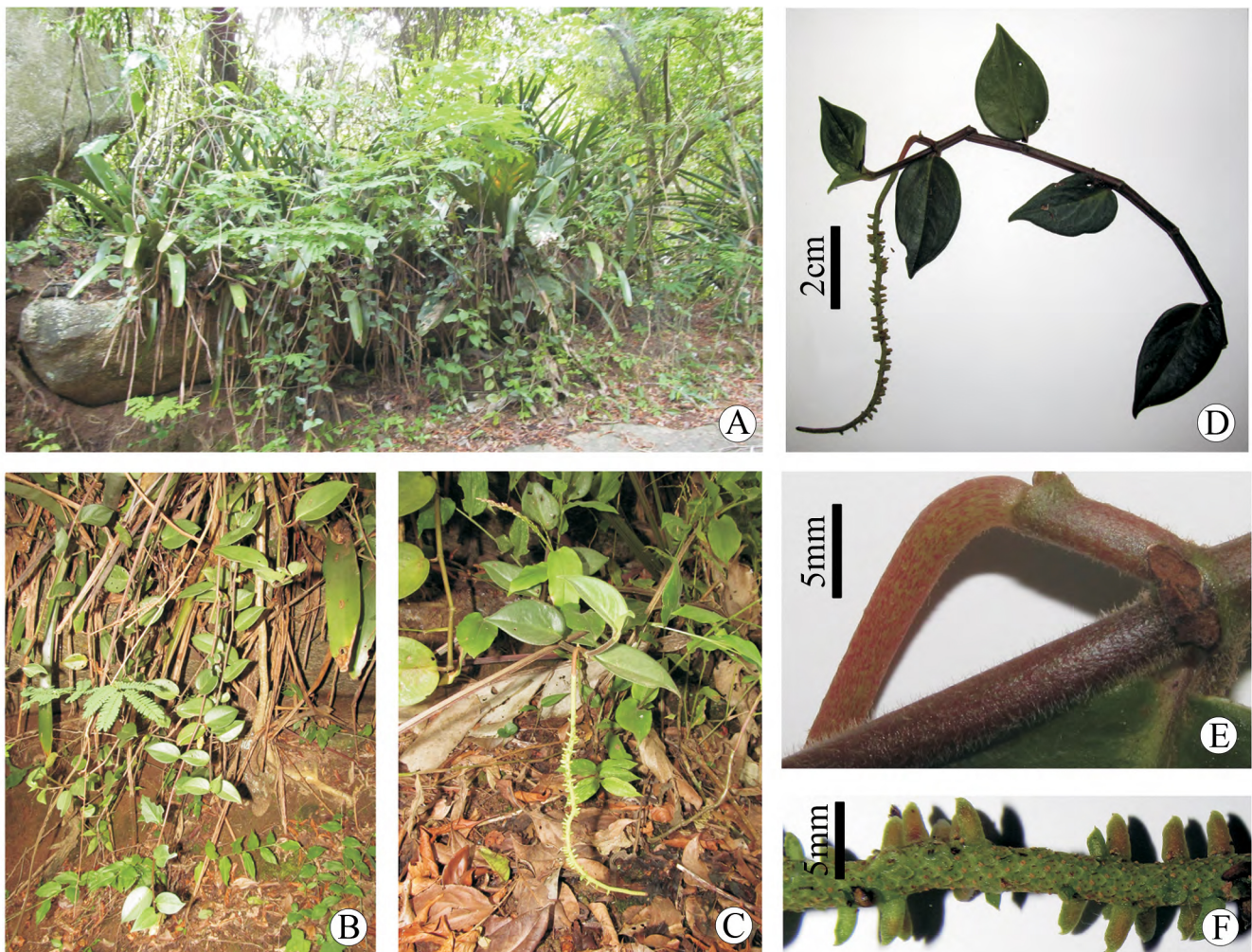


Figure 1. *Peperomia armondii* (Sarnaglia Junior et al. 571). **A)** Habitat at APA do Mestre Álvaro, Serra – ES, Brazil. **B)** Stems. **C)** Spike. **D)** Herborized stems. **E)** Villous stems. **F)** Detail of the spike with fruits.

(Figure 3) (Yuncker 1974). It was originally described by Swartz (1788) as *Piper hispidulum* Sw. and synonymized with *Peperomia hispidula* by Dietrich (1831). The range distribution of this species is from Mexico to Argentina (Yuncker 1974; Keller and Tressens 2005; Mobot 2013), in Brazil it was cited to Rio Grande do Sul, Paraná, Santa Catarina, São Paulo, Rio de Janeiro and Minas Gerais (Yuncker 1974; Guimarães et al. 2013).

This species was found in the municipality of Iúna, in Serra do Caparaó, southwestern Espírito Santo state (Figure 2).

SPECIMENS EXAMINED: Brazil: Espírito Santo: Iúna, Serra do Valentim, track's end of property of Mr. Plínio Silveira, 1,270 m elevation, 23 June 2012, fr. Zorzanelli, J.P.F and Silveira, P. 400 (VIES, RB).

Peperomia mandioccana

Peperomia mandioccana is characterized by small stoloniferous-erect herbs, hirtellous, opposite leaves, frequently alternate downwardly, yellow glandular dots; spikes up to 3.5 cm long and drupes with a pseudocupule (Figure 4) (Yuncker 1974). It was originally described by Miquel (1847) with specimens from the state of Rio de

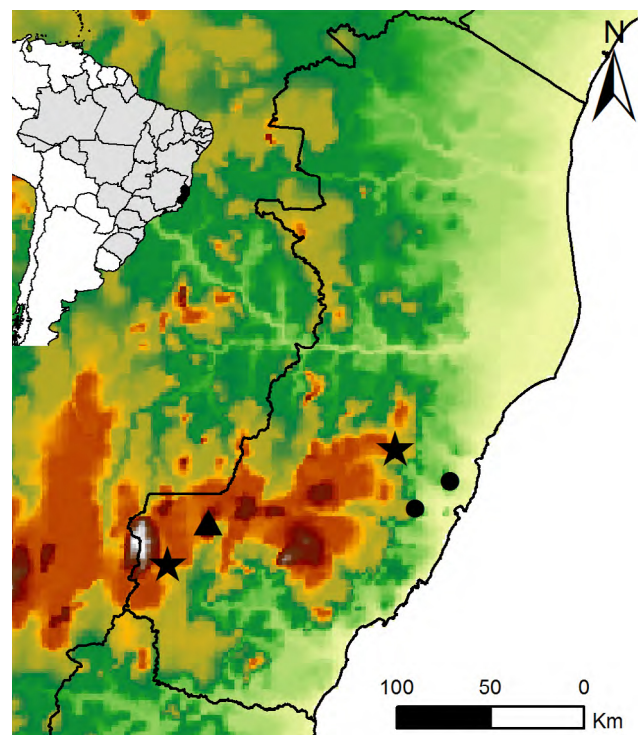


Figure 2. Location of the new records in Espírito Santo state, Brazil: *P. armondii* (dots), *P. hispidula* (triangle), and *P. mandioccana* (stars).

Janeiro. Yuncker (1974) and Guimarães and Carvalho-Silva (2012) extended its distribution for the state of Minas Gerais and São Paulo, respectively. Guimarães et al. (2013) extended its distribution to Santa Catarina and Paraná.

This species was found in two locations in Espírito Santo: Parque Nacional do Caparaó, in the municipality of Ibitirama in southwestern Espírito Santo state, and in the municipality of Santa Teresa in the mountain region of the state (Figure 2).

SPECIMENS EXAMINED: Brazil: Espírito Santo: Ibitirama, Santa Marta, Parque Nacional do Caparaó, 1,350 m elevation, 12 June 2012, fr., Dias, H.M. et al. 728 (VIES, RB). Santa Teresa, Valsugana Velha, 945 m elevation, 3 February 2013, fr., Sarnaglia Jr., V. B. and Lírio, E. J. 634.

ACKNOWLEDGEMENTS

We thank Paulo H. D. Barros and MSc João P. F. Zorzaneli for assistance during fieldwork; the curators of MBML, RB and VIES herbaria; and Matheus Poubel, Hugo F. Henrique, and Rafael Felipe de Almeida for the grammar revision. The first three authors thank CAPES for the fellowship granted and last author thanks CNPq for the productivity fellowship granted.

LITERATURE CITED

Almeida, R.F. and M.C.H. Mamede. 2014. Checklist, conservation status, and sampling effort analysis of Malpighiaceae in Espírito Santo state, Brazil. *Brazilian Journal of Botany* 37(3): 329–337. doi: [10.1007/s40415-014-0078-x](https://doi.org/10.1007/s40415-014-0078-x)

Brown Jr., K.S. and A.V.L. Freitas. 2000. Diversidade de Lepidoptera em Santa Teresa, Espírito Santo. *Boletim do Museu de*

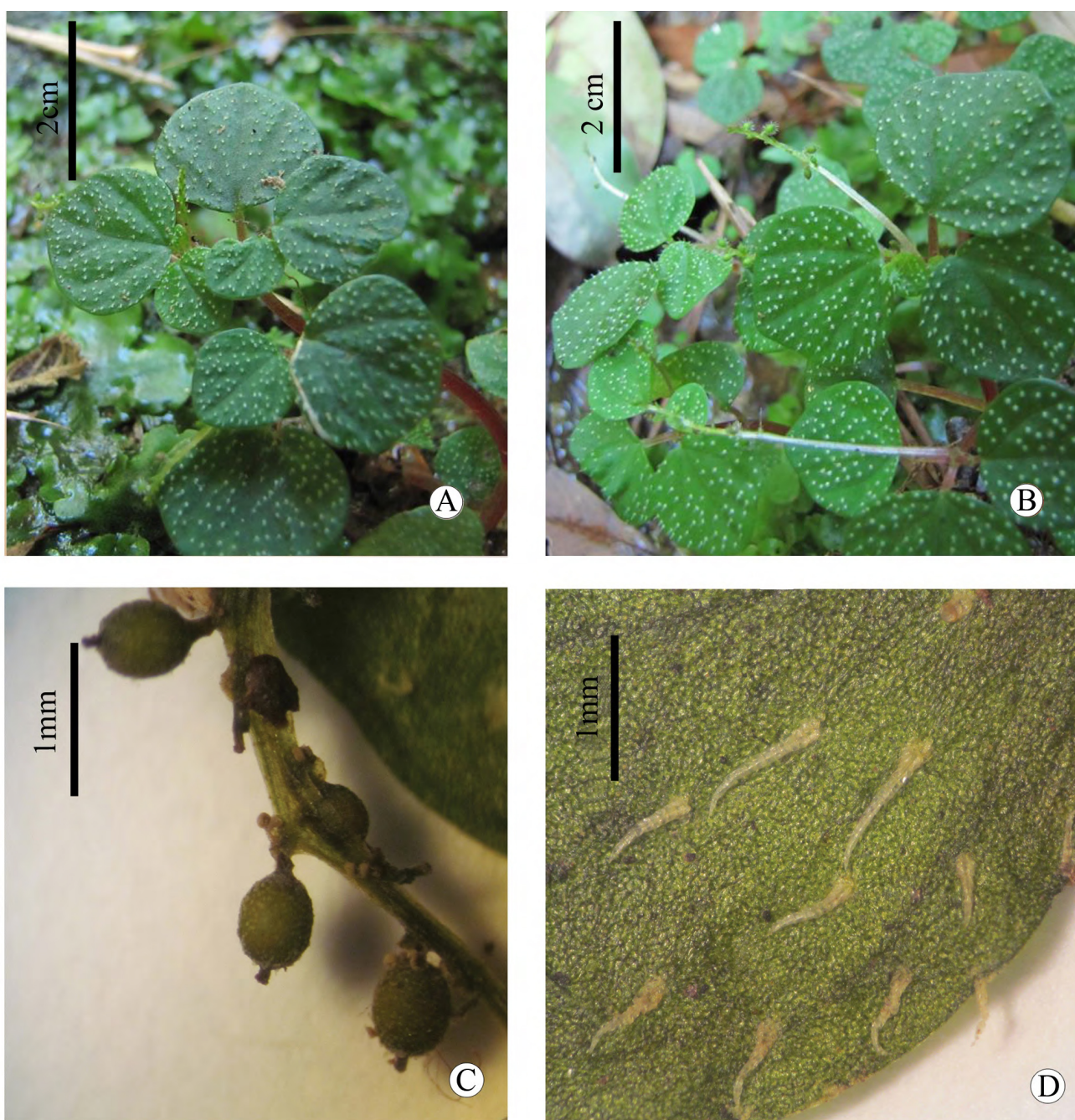


Figure 3. *Peperomia hispidula* (Zorzaneli, 400). **A–B** Habitat (photo by João P. F. Zorzaneli). **C** Stipitate fruits. **D** Hispid hairs on the leaves.

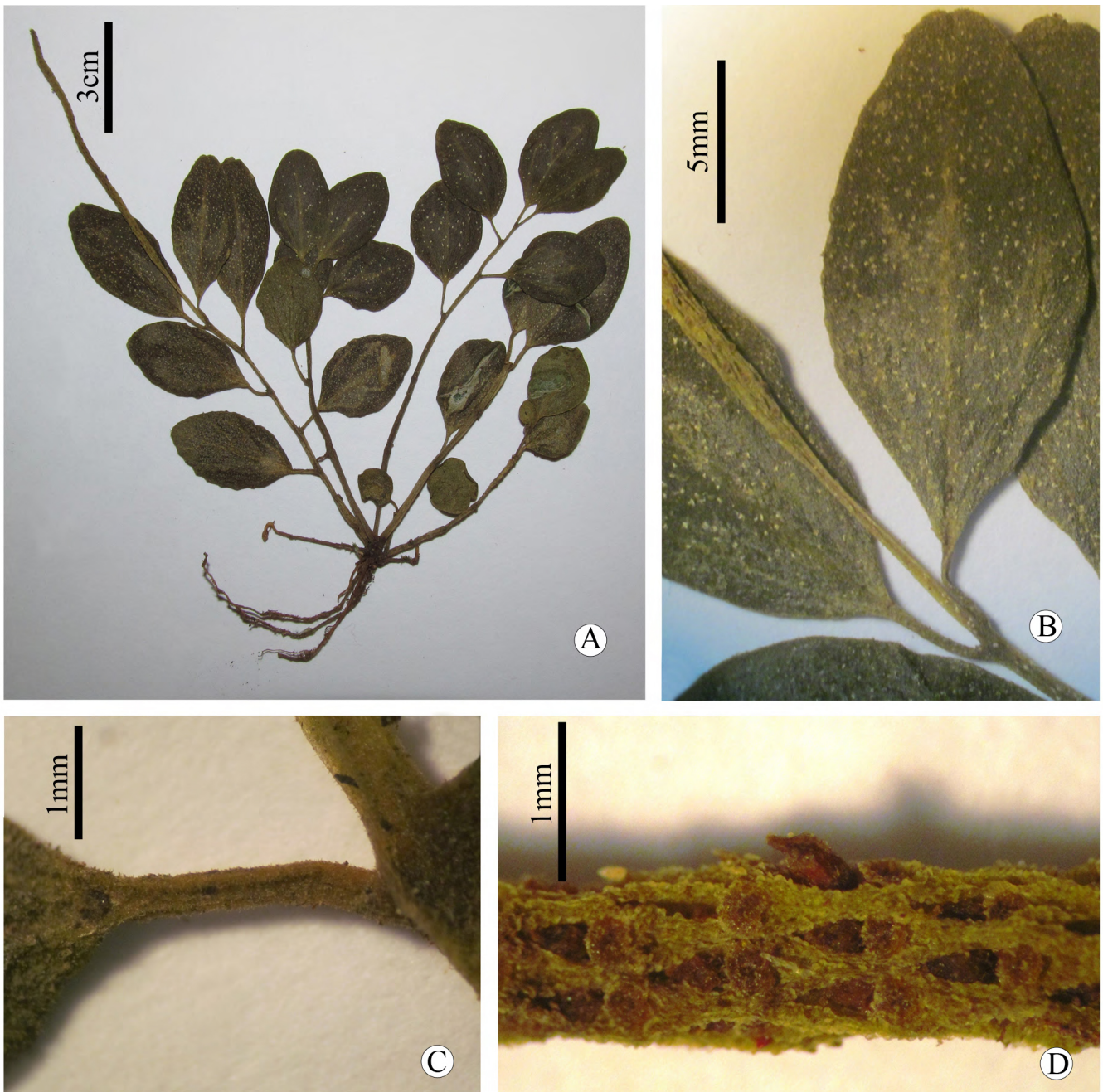


Figure 4. *Peperomia mandioccana* (Dias, 728). **A)** Habitat. **B)** Leaves. **C)** Hirtellous petiole and stems. **D)** Verruculose rachis and fruit.

- Biologia Mello Leitão (Nova Série) 11/12: 71–116. http://www.boletimmbml.net/pdf/11_05.pdf
- Carvalho-Silva, M. and E.F. Guimarães. 2008. *Peperomia ciliato-caespitosa* M. Carvalho-Silva and E. F. Guim. (Piperaceae): uma nova espécie para o Brasil. *Acta Botanica Brasilica* 22: 559–531. <http://acta.botanica.org.br/index.php/acta/article/viewFile/214/52>
- Dietrich, A.G. 1831. *Caroli a Linné species plantarum*, ed. 6, part 1. Berlin: G. C. Nauck. 735 pp.
- Frodin, D.G. 2004. History and concepts of big plant genera. *Taxon* 53: 753–776. doi: [10.2307/4135449](https://doi.org/10.2307/4135449)
- Guimarães, E.F. and M. Carvalho-Silva. 2012. Piperaceae; pp. 263–320, in: M.G.L. Wanderley, G.J. Shepherd, T.S. Melhem, S.E. Martins and A.M. Giuliatti (coords.). *Flora Fanerogâmica do Estado de São Paulo*. Vol. 7. São Paulo: Instituto de Botânica.
- Guimarães, E.F., C.L.F. Ichaso and C.G. Costa. 1984. Piperaceae 4. *Peperomia*; pp. 33–136, in: Reitz, R. (ed.). *Flora ilustrada Catarinense*. Parte I. Itajaí: Herbário Barbosa Rodrigues.
- Guimarães, E.F., M. Carvalho-Silva, D. Monteiro and E.S. Medeiros 2013. Piperaceae; in: *Lista de espécies da flora do Brasil*. Jardim Botânico do Rio de Janeiro. <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB12609>
- Keller, H.A. and S.G. Tressens. 2005. Novedades en *Peperomia* (Piperaceae) para la Argentina: con una clave para las especies de Misiones. *Boletín de la Sociedad Argentina de Botánica* 40: 3–4: 297–306. <http://www.scielo.org.ar/pdf/bsab/v40n3-4/v40n3-4a14.pdf>
- Miquel, F.A.W. 1847. *Mantissa Piperacearum*. E speciminibus Musei Vindobonensis, Regii Monacensis et Martiani. *Linnaea* 20: 117–182.
- Mobot. 2013. *Tropicos.org*. *Peperomia hispidula* (Sw.) A. Dietr. Missouri Botanical Garden. Accessed at <http://www.tropicos.org/Name/25001375>, 23 March 2013.
- Passamani, M., S.L. Mendes and A.G. Chiarello. 2000. Non-volant mammals of the Estação Biológica de Santa Lúcia and adjacent areas of Santa Teresa, Espírito Santo, Brazil. *Boletim do Museu de Biologia Mello Leitão (N. Ser.)* 11/12: 201–214. http://www.boletimmbml.net/pdf/11_05.pdf

- boletimmbml.net/pdf/11_12.pdf
- Samain, M., L. Vanderschaeve, P. Chaerle, P. Goetghebeur, C. Neinhuis and S. Wanke. 2009. Is morphology telling the truth about the evolution of the species rich genus *Peperomia* (Piperaceae)? *Plant Systematic and Evolution* 278: 1–21. doi: [10.1007/s00606-008-0113-0](https://doi.org/10.1007/s00606-008-0113-0)
- Simon, J. E. 2000. Composição da avifauna da Estação Biológica de Santa Lúcia, Santa Teresa – Espírito Santo. *Boletim do Museu de Biologia Mello Leitão (N. Ser.)* 11/12: 149–170 http://www.boletimmbml.net/pdf/11_09.pdf
- SOS Mata Atlântica. 2011. Atlas dos remanescentes florestais da Mata Atlântica período 2008–2010. São Paulo: Fundação SOS Mata Atlântica. 118 pp.
- Swartz, O. 1788. *Nova genera & species plantarum seu prodromus*. Stockholm: Holmiae, Upsaliae and Aboae. 153 pp.
- Thomaz, L. D. and R. Monteiro. 1997. Composição florística da Mata Atlântica de encosta da Estação Biológica de Santa Lúcia, município de Santa Teresa – ES. *Boletim do Museu de Biologia Mello Leitão* 7: 3–48. http://www.boletimmbml.net/pdf/07_01.pdf
- Wendt, T., T.S. Coser, H. Boudet-Fernandes and G. Martinelli. 2010. Bromeliaceae do município de Santa Teresa, Espírito Santo: lista de espécies, distribuição, conservação e comentários taxonômicos. *Boletim do Museu de Biologia Mello Leitão* 27: 21–53 http://www.boletimmbml.net/pdf/27_02.pdf
- Werneck, M.S., M.E.G. Sobral, C.T.V. Rocha, E.C. Landau and J.R. Stehmann. 2011. Distribution and endemism of angiosperms in the Atlantic Forest. *Natureza & Conservação* 9: 188–193. doi: [10.4322/natcon.2011.024](https://doi.org/10.4322/natcon.2011.024)
- Yuncker, T.G. 1974. The Piperaceae of Brazil. III: *Peperomia*; taxa of uncertain status. *Hoehnea* 4: 71–413.
- Yuncker, T.G. 1966. New species of Piperaceae from Brazil. *Boletim do Instituto de Botânica* 3: 140–195.
- Zanotti, C.A. and F. Biganzoli. 2010. *Peperomia nitida* y *Peperomia armondii* (Piperaceae), nuevos registros para la Argentina. *Darwiniana* 48(2): 210–213. <http://www.ojs.darwin.edu.ar/index.php/darwiniana/article/view/22>
- Authors' contribution statement:** VBS and EFG revised the herbarium materials. VBS wrote the first draft of manuscript. EJM and JF prepared the figures and map and corrected the first draft of manuscript. EFG revised the final text.
- Received:** February 2013
Accepted: August 2014
Editorial responsibility: James Byng