Rediscovery of *Cybianthus froelichii* (Primulaceae), an endangered species from Brazil

Maria de Fátima Freitas[1*], Tatiana Tavares Carrijo[2]
& Bruna Nunes de Luna[1]

RESUMO: (**Redescoberta de *Cybianthus froelichii* (Primulaceae), uma espécie ameaçada de extinção do Brasil**). Uma espécie redescoberta de *Cybianthus* subgênero *Cybianthus* é descrita e ilustrada. *Cybianthus froelichii* é proximamente relacionado à *C. cuneifolius*, mas se diferencia pelas folhas grandes e flores pistiladas sésseis. Espécie endêmica da Mata Atlântica e considerada ameaçada de extinção. *C. froelichii* é aqui ilustrada pela primeira vez.

Palavras-chave: Mata Atlântica, diversidade, Ericales, Neotrópico, Myrsinoideae.

ABSTRACT: A rediscovered species of *Cybianthus* subgenus *Cybianthus* is described and illustrated. *Cybianthus froelichii* is most closely related to *C. cuneifolius*, but may be distinguished by its large leaves and sessile pistillate flowers. This species is endemic to the Atlantic Forest, Brazil, and is considered endangered. *C. froelichii* is illustrated here for the first time.

Key words: Atlantic Forest, diversity, Ericales, Neotropic, Myrsinoideae.

[1] Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Diretoria de Pesquisas, Rua Pacheco Leão 915, CEP 22460-030, Rio de Janeiro, RJ, Brasil.

[2] Universidade Federal do Espírito Santo, Centro de Ciências Agrárias, Departamento de Biologia, Alto Universitário s.n., CEP 29500-000, Alegre, ES, Brasil.
*Corresponding author. e-mail: ffreitas@jbrj.gov.br
Recebido: 21 fev 2015 – Aceito: 30 set 2015

Introduction

The neotropical *Cybianthus* Mart. comprises about 160 species circumscribed in 10 subgenera (Pipoly, 1993). The genus is well defined by the unique combination of axillary inflorescences, gamosepalous and gamopetalous flowers, and stamens connate by their filaments at least one-fourth their length and adnate at the corolla tube at least one-third its length (Agostini, 1980; Pipoly & Ricketson, 2006).

Most of the knowledge about the richness of *Cybianthus* species after the wide revision of Myrsinaceae (= Primulaceae) by Mez (1902) has come from checklists and local floras from Venezuela (Steyermark, 1953), Peru (Macbride, 1959; Pipoly, 1998), Guyanas (Pipoly, 1988, 1992, 1999b, 2002) and Brazil (Miquel, 1856; Pipoly *et al.* 1995; Fiaschi *et al.* 2004; Jung-Mendaçolli *et al.* 2005; Freitas *et al*., 2009; Freitas & Carrijo, 2008, 2014, 2015). New species were described from Central (Pipoly, 1993) and Southeastern Brazil (Joly & Jung, 1988), and many taxa have been pointed out as new for the Amazonia Forest (Pipoly, 1999a, 2008).

Preparing the taxonomic treatment of Primulaceae for the "Flora of the State of Rio de Janeiro", collections of *Cybianthus froelichii* Mez were found and identified. This species was first described by Mez (1902) based on a single collection of a male specimen, included on Swedish Museum of Natural History (S). The protologue of *C. froelichii* mentioned that the species occurs in Brazil, being its location unknown.

The identified collections of *C. froelichii* allowed to determinate the specie's location of occurrence in Brazil, and to complete the morphological description of this species including the features of female flowers and fruits. *Cybianthus froelichii* is illustrated here for the first time.

Results

Taxonomic treatment

Cybianthus froelichii Mez *in* Engler (1902: 225) (Figure 1).

Type: —BRAZIL, unknown locality, *Frölich s.n.* (holotype S 05-10356).

Shrubs 1.5–4 m tall. Branches terete, (1.9)2.4–3.4 mm diam., glabrescent, apex with puberulent trichomes. Leaves papyraceus, the blades obovate to lanceolate, 10–17 × 3.5-5 cm, minutely punctate abaxially, glabrous; base cuneate, apex acute to acuminate, entire margin, slightly sinuate; petiole 0.7–1.5 cm, puberulent. Staminate inflorescence a simple raceme, 6–11.5 cm long, glandular

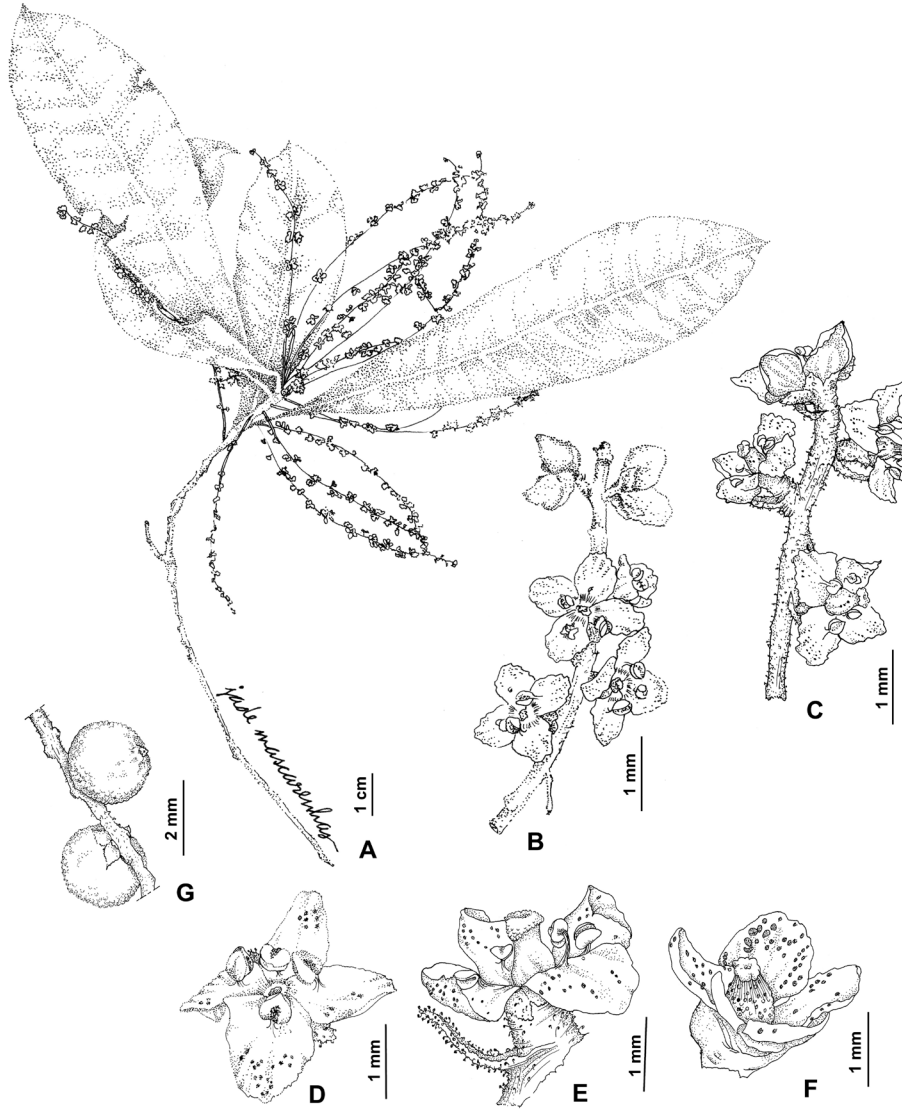

Figure 1. *Cybianthus froelichii*. **A**. Branch with staminate inflorescences. **B**. Detail of a staminate inflorescence. **C**. Detail of a pistillate inflorescence. **D**. Staminate flower. **E**. Pistillate flower with staminodes. **F**. Pistillate flower without staminodes. **G**. Immature fruits. (A-C *L. F. T. Menezes 460*; D-G *Menezes s.n.,* RBR 10576)

ciliate; floral bracts lanceolate, longer than the pedicels, 1–1.2 mm long; pedicels cylindrical, 0.7–0.9 mm long, glandular ciliate; staminate flower 4-merous, calyx cotyliform, ca. 1.7 mm long, sepals acute, 0.8 mm long, 0.6 mm wide, adaxially orange punctate, glandular-granulose margin; corolla rotate, 2–2.5 mm long, with a tube 0.5 mm long, ovate lobes, 1.4–2 mm long., 1.3–1.4 mm wide, adaxially orange punctate globose, abaxially totally glandular-granulose, more concentrated at the junction of the tube and lobes and margin; staminal tube 0.3 mm long, filaments 0.3 mm long, 0.4 mm wide, 0.5 mm inserted above the corolla base, anther 0.6 mm long and wide, basifixed, connective punctate; pistillode punctate, 0.1–0.2 mm long. Pistillate inflorescence as staminate one, but 2.5–3.5 cm long, glandular ciliate, flowers sessile, floral bracts 1.3–1.5 mm long; pistillate flower as staminate, 1.5 mm long, sepals 1 mm long and wide; petals ovate 1.5–1.7 mm long, 1.2 mm wide, floral tube ca. 0.5 mm, the lobes 1–1.2 mm long, staminal tube 0.6–0.7 mm long, filaments 0.3 mm long, 0.7 mm wide, 0.6–0.7 mm insert above the corolla base, staminodes 0.3 mm long, 0.5 mm wide, basifixed, connective punctate orange to brown, pistil conic, ca. 1.2 mm long, translucent glandular lepidote, ovary ca. 0.5–0.7 mm long, the style 0.3–0.4 mm long, stigma 4-lobate, ca. 0.2 mm long, glandular-papillate, ovules 2–3, immersed in the placenta. Fruit globose, 6 mm diam, punctate. Seeds 3 mm long, 5 mm wide, endosperm smooth and excavated.

Distribution:—Endemic from the sandy coastal plains of the Atlantic Forest (Restinga) in the state of Rio de Janeiro.

Flowerig and fruiting: —Flowers were seen in May and June and fruits in September and October.

Etymology:—The species epithet honors Joseph Aloys von Froelich, a German physician and botanist (Stafleu, 1976).

Specimens examined:—BRAZIL. RIO DE JANEIRO: Município de Mangaratiba, Restinga de Marambaia, Campos de prova da Marambaia, 12 Sep 2000, *L. F. T. Menezes 460* (RBR, RB); Praia da armação, 12 Oct 2002, *L. F. T. Menezes* s.n. (RBR 10576, RB); Município do Rio de Janeiro, Barra da Tijuca, 16 May 1932, *J.G. Kuhlmann* s.n. (RB 152818); 22 Aug 1932, *J. G. Kuhlmann s.n.* (RB 152819); Pedra de Itaúna, 13 May 1975, *D. Araújo & A. L. Peixoto* 527 (RB); 9 Jun 1969, *D. Sucre* et al. 5256 (RB); 30 Oct 1969, *D. Sucre 6156* (RB); 2 Nov 1969, *D. Sucre et al. 5897* (RB); 4 Dec 1978, *S.L. Peixoto s.n.* (RB 194204); Restinga de Jacarepaguá, 15 Oct 1951, *E. Pereira et al.* 4425 (RB).

Conservation status:—According to IUCN (2014) Red List criteria, *Cybianthus froelichii* may be classified as endangered (ENB1a, biii), as its extent of occurrence is estimated to be less than 5000 km² (B1), and is known to exist at no more than five locations (a) and with a continuous decline in area, extent and quality of habitat (biii).

This species belongs to *Cybianthus* subgenus *Cybianthus* due to its racemose inflorescences, 4-merous flowers, rotate corolla, filaments completely fused with the corolla tube, appearing epipetalous and basifixed and poricide anthers (Agostini, 1980).

Cybianthus froelichii Mez is most closely related to *C. cuneifolius* Mart. They share vegetative characteristics, such as leaves with similar size, but *C. froelichii* differs by wider leaf apex, and thick glabrous branches. The inflorescences are longer than those from *C. cuneifolius*, and pistillate flowers are sessile (Table 1). In addition, *C. cuneifolius* is found in premontane and pluvial cloudy forest (up to 400 m), while *C. froelichii* in sandy coastal plains, at sea level.

The species of *Cybianthus* in Brazil are predominant in the Amazonia and Atlantic Tropical Forests, and Cerrado. On sandy coastal plains, the genus is represented by four species, occurring from Rio de Janeiro to Bahia, which can be distinguished by the key presented below (Freitas & Carrijo, 2015).

Key to the species of *Cybianthus* from sandy coastal plains from Brazil

1. Branches smooth, non-angulated, slightly lenticeled; leaves with secondary veins conspicuous, abaxial surface glabrous 2

1' Branches smooth to rough, angulated, lenticeled; leaves with secondary veins inconspicuous, abaxial surface ferrugineous-tomentose 3

2. Leaves congested on the branches, coriaceous, elliptical to obovated, 10–25 × 2.5–4 cm; racemes compound .....*C. densiflorus*

Table 1. Morphological comparison between *Cybianthus froelichii* and *C. cuneifolius.*

	C. froelichii.	*C. cuneifolius*
Staminate inflorescence	6–11.5 cm long	3.5–4 cm long
Petiole	0.7–1.5 cm long	0.6–1 mm long
Petiole indumentum	puberulent	glabrous
Leaf shape	Obovate to lanceolate	Lanceolate
Leaf length	10.0–17.0 × 3.5–5.0 cm	9–15 × 1.5–3 cm
Bracteoles	1–1.2 mm long	0.5 mm long
Pedicels	0.7–0.9 mm long in staminate flowers; sessile in pistilate flowers	3.5–3.7 mm long in staminate flowers; 1.5–2 mm long in pistilate flowers

2’ Leaves uncongested in the branches, papyraceus, obovated to lanceolated, 10–17 X 3.5–5 cm, racemes simple .....C. *froelichii*
3. Branches smooth and angulated, sparsely lenticellate; leaves obovate, 13–20 × 5–10.5 cm, petioles 1.8–3 cm long .....*C. amplus*
3’ Branches smooth, non- angulated, densely lenticellate; leaves lanceolate leaves, 4–10 × 1.8–3 cm, petioles 1.3–2 cm long .....*C. brasiliensis*

Acknowledgements

We thank Jade Mascarenhas for the line drawing, the reviewers, the Instituto de Pesquisas Jardim Botânico do Rio de Janeiro for support and FAPERJ for the financial support.

Literature cited

Agostini, G. 1980. Una nueva clasificación del género *Cybianthus* (Myrsinaceae). Acta Botanica Venezuelica 10 (2): 129–185.

Fiaschi, P., Lobão, A. Q. & Christiano, J. C. S. 2004. Flora de Grão-Mogol, Minas Gerais: Myrsinaceae. Boletim de Botânica da Universidade de São Paulo 22 (2): 319–322.

Freitas, M.F. & Carrijo, T.T. 2008. A família Myrsinaceae nos contrafortes do Maciço da Tijuca e entorno do Jardim Botânico do Rio de Janeiro. Rodriguésia 59: 813–28.

Freitas, M.F. & Carrijo, T.T. 2014. Primulaceae. Catálogo das espécies de plantas vasculares e briófitas do Estado do Rio de Janeiro. Rio de Janeiro: Instituto de Pesquisas Jardim Botânico do Rio de Janeiro. Avaiable from: http://florariojaneiro.jbrj.gov.br.

Freitas, M.F. & Carrijo, T.T. 2015. Primulaceae. In: Lista de Espécies da Flora do Brasil. Jardim Botânico do Rio de Janeiro. Avaiable from: http://reflora.jbrj.gov.br/jabot/floradobrasil/FB121874 (accessed in 10 Abr. 2015).

Freitas, M.F.; Carrijo, T.T.; São Leão, L.C. & Kinoshita, L.S. 2009. Flora da Serra do Cipó: Myrsinaceae. Boletim de Botânica da Universidade de São Paulo 27: 259–267.

IUCN Standards and Petitions Subcommittee. 2014. Guidelines for Using the IUCN Red List Categories and Criteria. Version 11. Downloadable from http://www.iucnredlist.org/documents/RedListGuidelines.pdf

Joly, A. B. & Jung, S. L. 1978. *Cybianthus coronatus* Joly et Jung sp. n. (Myrsinaceae), uma nova espécie da Serra do Cipó, Minas Gerais, Brasil.

Hoehnea 7: 41–46.
Jung-Mendaçolli, S. L., Bernacci, L. C. & Freitas, M. F. 2005. Myrsinaceae. In: M. G. L. Wanderley, G. J. Shepherd, T. S. Melhem & A. M. Giulietti, Flora fanerogâmica do estado de São Paulo. São Paulo. 4: 279–300.
Macbride, J. F. 1959. Flora of Peru: Myrsinaceae. Publ. Field Mus. Nat. Hist. Bot. Ser. 13 (1):163–203.
Mez, C. 1902. Myrsinaceae. In: A. Engler (Ed.). Das Pflanzenreich. Verlag von Wilhelm Engelmann, Leipzig, vol. 4, 236 (Heft 9), pp. 1–437.
Miquel, F.A.G. 1856. *Myrsineae*. In: C.F.P. von Martius, A.G. Eichler, & I. Urban (Eds.), Flora Brasiliensis 10: 269–338.
Pipoly, J. J. 1988. Contribuciones para una monografía del género *Cybianthus* (Myrsinaceae) V. Dos especies nuevas de la Guayania venezolana. Ernstia 50: 32–40.
Pipoly, J. J. 1992. The genus *Cybianthus* subgenus *Conomorpha* (Myrsinaceae) in Guyana. Ann. Mo. Bot. Gard., 79: 908–957.
Pipoly, J. J. 1993. Notes on *Cybianthus* subgenus *Cybianthus* (Myrsinaceae) in southeastern Brazil. Novon 3: 459–462.
Pipoly, J. J. 1998. The genus *Cybianthus* (Myrsinaceae) in Ecuador and Peru. Sida 18 (1): 1–60.
Pipoly, J. J. 1999a. Myrsinaceae. In: J. E. L. S. Ribeiro, M. J. G. Hopkins, A. Vicentini, C. A. Sothers, M. A. S. Costa, J. M. Brito, M. A. D. Souza, L. H. Martins, L. G. Lohmann, P. A. Assunção, E. C. Pereira, C. F. Silva, M. R. Mesquita, & L. C. Procópio (Eds.) Flora da Reserva Ducke. Guia de identificação das plantas vasculares de uma floresta de terra-firme na Amazônia Central. INPA-DFID, Manaus, pp. 337–339.
Pipoly, J. J. 1999b. Two new species of Myrsinaceae from French Guiana. Brittonia, 51 (2): 128–133.
Pipoly, J. J. 2002. Myrsinaceae. In: A. S. Mori, G. Cremers, C. A. Gracie, J. Granville, S. V. Heald, M. Hoff & J. D. Mitchell (Eds.) Guide to the vascular plants of Central French Guiana. Part. 2. Dicotyledons. Memories of the New York Botanical Garden. 76(2): 532–539.
Pipoly, J.J. 2008. Myrsinaceae. In: Daly, D.C. & Silveira, M. Primeiro Catálogo da Flora do Acre, Brasil. Ed. Universidade Federal do Acre, Rio Branco, Acre. pp. 276–277.
Pipoly, J. J. & Y. B. Harvey. 1995. Myrsinaceae. In: B. Stannard (Ed.) Flora of the Pico das Almas, Chapada Diamantina, Bahia, Brazil. Royal Botanic Garden, Kew, U.K. pp. 487–491.
Pipoly, J. J. & Ricketson, J. M. 2006. New species of *Cybianthus* Mart. (Myrsinaceae) from the Hylean/Andean Interface of Peru. Novon 16: 248–253.

Stafleu, F. A. 1976. Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types. Utrecht: Bohn, Scheltema & Holkema, 2 ed., vol 1, p. 893.

Steyermark, J. 1953. Contributions to the flora of Venezuela from Ericaceae through Compositae. Fieldiana: Botany 28 (3): 511–522.