

## Flora of Espírito Santo: Oleandraceae

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### Abstract

As part of the Flora of Espírito Santo project, we present the taxonomic treatment of Oleandraceae, with key, descriptions, illustrations, and list of specimens examined. In this state, two species of *Oleandra* occur: *O. brasiliiana* and *O. quartziticola*. Apparently, *O. quartziticola* is narrow endemic, whereas *O. brasiliiana* is widespread in the Brazilian Atlantic Rainforest. Both species occur in the Southern part of the state.

**Key words:** endemic ferns, epipetric ferns, *Oleandra*, Southeastern Brazil.

### Resumo

Como parte do projeto Flora do Espírito Santo, aqui é apresentado o tratamento taxonômico de Oleandraceae, contendo chave de identificação, descrições, ilustrações e lista de espécimes examinados. Neste estado, duas espécies de *Oleandra* ocorrem: *O. brasiliiana* e *O. quartziticola*. Aparentemente, *O. quartziticola* é micro-endêmica, enquanto *O. brasiliiana* é amplamente distribuída na Floresta Atlântica. Ambas espécies ocorrem na porção sul do estado.

**Palavras-chave:** samambaias endêmicas, samambaias epipétricas, *Oleandra*, Sudeste do Brasil.

### Introduction

Oleandraceae is a pantropical, monogeneric family of ferns with ca. 30 species currently recognized (Maxon 1914; Roux 2009; Hovenkamp & Ho 2012; Zhang & Hovenkamp 2013; Schwartzburd *et al.* 2016). This family is sister group to a clade containing Polypodiaceae and Davalliaceae. These three families essentially present epiphytic or epipetric habit, and abscission of leaves due to articulation on phyllopodia (Schneider *et al.* 2004; Tsutsumi & Kato 2006; Schuettpelz & Pryer 2008; Smith *et al.* 2008). However, Oleandraceae is characterized by stipe-like phyllopodia and reniform indusia (Hovenkamp & Ho 2012), whereas the phyllopodia in the other two families are rhizomatous (mostly lost in the Grammitids), and the indusia in Davalliaceae is generally cup-shaped and absent in Polypodiaceae (Smith *et al.* 2008).

The number of species in *Oleandra* has been controversial, especially due to two conflicting species concept of Maxon (1914) and Tryon (1997, 2000). In the Brazilian Atlantic Rainforest, one name has been largely adopted, *Oleandra articulata* (Sw.) C.Presl, but other two names have also been used, *O. baetae* Damazio and *O. hirta* Brack.

(*e.g.*, Damazio 1906; Maxon 1914; Lisbôa 1956; Sehnem 1979; Salino & Almeida 2009; Sylvestre 2010; Prado *et al.* 2015). Recently, Schwartzburd *et al.* (2016) proposed a narrower species concept for the Atlantic Rainforest species, considering five species and a putative hybrid there. These authors also indicated that the largely used name, *O. articulata*, do not apply to the species from the Atlantic Rainforest. For the state of Espírito Santo, they listed only *O. brasiliiana* Schwartzb. & J.Prado and *O. quartziticola* Schwartzb. & J.Prado. For the project Flora of Espírito Santo, we here present the taxonomic treatment of Oleandraceae.

### Material and Methods

This paper is based on the recently published taxonomic revision of *Oleandra* from the Brazilian Atlantic Rainforest, in which the following herbaria were visited: CESJ, MBM, OUPR, RB, SP, SPF, UPCB, and VIC, plus images online from K, NY, and US. In addition to these herbaria, we further visited MBML and VIES.

We studied *Oleandra quartziticola* in the field, in the municipality of Vargem Alta. Other species (including *O. brasiliiana*) were also studied in the field, but not in Espírito Santo (see Schwartzburd *et al.* 2016).

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The distribution map was drawn using the software Diva-GIS (Hijmans 2015). For the materials without geographical coordinates, we estimated them using Google Earth (<<https://www.google.com/earth/>>).

**Results and Discussion**

In the state of Espírito Santo, two species of *Oleandra* occur: *O. brasiliiana* and *O. quartziticola*, and both are known only from a few localities in the southern part of the state (Fig. 1), and from few herbaria materials. Apparently, *O. quartziticola* is narrow endemic, whereas *O. brasiliiana* is widespread in the Brazilian Atlantic Rainforest.

**Oleandraceae**

Plants epiphytic or rupestral, rarely terrestrial. Rhizomes long-creeping or scrambling, with or without pruinose exsudates, 1–8 mm diam., with or without rhizophore-like roots, scaly; scales spreading or appressed, peltate, commonly glandular-ciliate. Phyllopodia stipe-like. Fronds

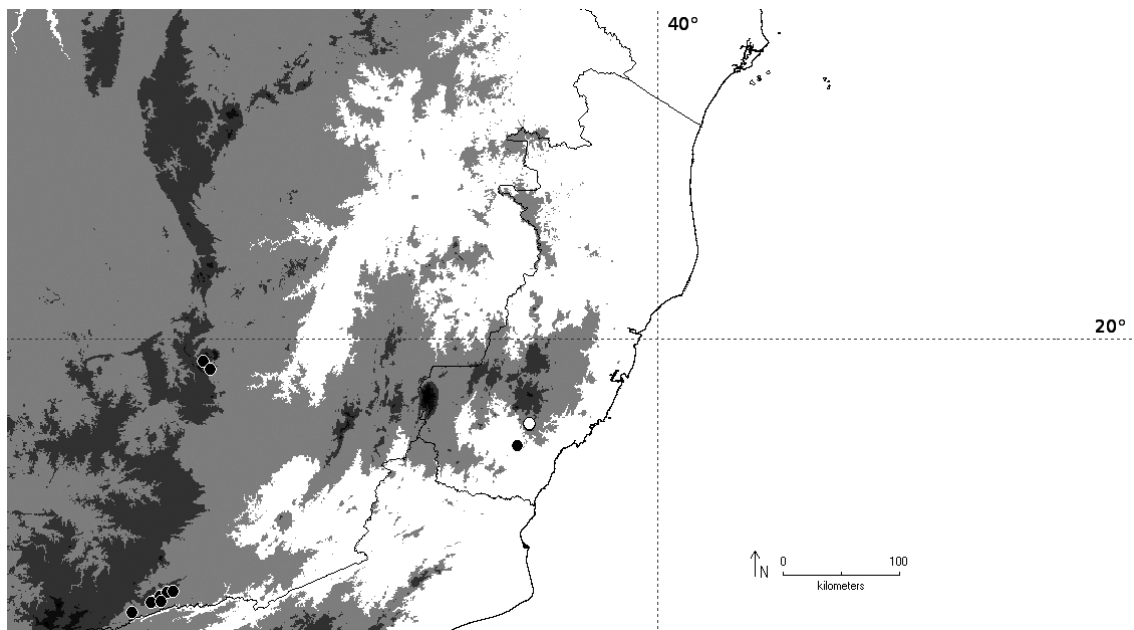
sparse or in whorls, monomorphic, articulated to phyllopodia; petioles terete, glabrous, with scales and/or hairs; laminae simple, linear, elliptic or obovate; midribs glabrous, glabrescent, with scales, catenate hairs, and/or with glandular hairs; veins free or rarely partly anastomosing, with or without catenate and/or glandular hairs; laminar tissue between the veins with or without catenate and/or glandular hairs; laminar margins with or without catenate and/or glandular hairs; sori abaxial, in one row between midribs and laminar margins; indusia reniform or orbicular-reniform, glabrous or with hairs; spores monolete.

*Oleandra* Cav., Anales Hist. Nat. 1(2):115. 1799.

A pantropical genus with ca. 30 species, and no apparent center of diversity (ca. eight in Asia, four in Africa, and 15 in the Americas) (Maxon 1914; Roux 2009; Hovenkamp & Ho 2012; Schwartsburd *et al.* 2016). In the state of Espírito Santo, two species occur as rupestral in the mountains of quartz of the Southern part (Fig. 2a-j).

**Key to species of *Oleandra* from the state of Espírito Santo**

- 1. Laminae glabrescent (with scattered hairs on midribs and laminar margins, especially in the laminar apex), or appearing glabrous; indusia monochromatic ..... 1. *Oleandra brasiliiana*
- 1'. Laminae pubescent throughout (with conspicuous hairs on midribs, veins, and laminar margins); indusia bicolorous..... 2. *Oleandra quartziticola*



**Figure 1** – Distribution of *Oleandra* species in Espírito Santo and near areas – *O. brasiliiana* (●); *O. quartziticola* (○). Altitudinal layer in gray scale for each 500 m, from white to black.

**1. *Oleandra brasiliiana*** Schwartsb. & J.Prado, Amer. Fern J. 106(3): 199-201, f. 1e-j, 3. 2016.

Figs. 1; 2e-j

Plants rupestral or rarely epiphytic. Rhizomes light brown to blackish, not pruinose, 1.5–2.5 mm diam., with rhizophore-like roots; scales spreading, bicolorous, centrally black, orange at the margins, moderate to densely glandular-ciliate. Phyllopodia 10–40 mm long. Fronds sparse, 12–35 cm long; petioles 3–7(–10) cm long, shining dark brown or greenish-brown; laminae generally obovate, rarely elliptic, cuneate at base, aristate at apex, 10–30 × (2–)4.5–7 cm; midribs glabrescent on both sides, with scattered 2–5-celled catenate hairs and 2–5-celled glandular hairs, sometimes seeming glabrous, lacking scales; veins free, glabrous on both sides; laminar tissue between the veins abaxially glabrous, adaxially glabrescent, with scattered catenate and glandular hairs; laminar margins cartilaginous, glabrescent, with scattered catenate and glandular hairs, especially common at the laminar apices; sori infra-medial to medial; indusia orbicular-reniform, dark brown, glabrous; spores light brown.

**Specimens examined:** Cachoeiro de Itapemirim, Vargem Alta, Morro de Sal, 21.VIII.1948, A.C. Brade 19324 (RB-on 2 sheets); 21.VIII.1948, A.C. Brade 3452 (CESJ); Vargem Alta, 3.V.1966, A.P. Duarte 9767 (MBM, RB-on 2 sheets, VIC).

**Additional specimens examined:** BRAZIL. BAHIA: Arataca, Serra do Peito de Moça, RPPN, Caminho das Pedras, 15°10'25"S, 39°20'30"W, 950 m, 6.VIII.2006, P.H. Labiak et al. 3652 (NY, SP, UPCB). CEARÁ: Maranguape, 3°54'5"S, 38°43'12"W, 900 m, 10.IV.2011, P.B. Schwartsburd & J.A.P. Araújo 2516 (EAC, NY, SP, VIC). MINAS GERAIS: Santa Bárbara do Monte Verde, 21°57'55"S, 43°49'51"W, 1,200 m, 24.IV.2004, J.P.S. Condack 135 (RB, VIC). RIO DE JANEIRO: Serra do Couto, A. Glaziou 2153 (RB-30604 [on 2 sheets]). SÃO PAULO: Serra de Paranapiacaba, IX.1925, A.C. Brade 8402 (MBM, RB-on 2 sheets).

*Oleandra brasiliiana* is widespread along the Brazilian Atlantic Rainforest, from the state of Bahia to São Paulo, with a disjunct population in Ceará. In the state of Espírito Santo it has been found only in the mountains of quartz (*morros de sal*) of Vargem Alta (previously belonging to Municipality of Cachoeiro do Itapemirim), as rupestral on quartzitic boulders. Outside Espírito Santo, *O. brasiliiana* also occurs as epiphyte and rupestral in other types of rocks.

*Oleandra brasiliiana* have commonly been identified as *O. articulata*. Schwartsburd et al. (2016) recently showed that *O. articulata* do not occur in the Brazilian Atlantic Rainforest.

*Oleandra brasiliiana* (Fig. 2e-j) is characterized by its glabrescent laminae, sometimes appearing fully glabrous, generally obovate laminae, and lack of scales on midribs. It differs from *O. quartzitica* (Fig. 2a-d) by glabrescent laminae (*vs.* pubescent throughout), generally obovate laminae (*vs.* elliptical), glabrous veins (*vs.* pubescent on both sides), and monochromatic, dark brown indusia (*vs.* indusia bicolorous, centrally dark brown, light brown at the margins).

**2. *Oleandra quartzitica*** Schwartsb. & J.Prado, Amer. Fern J. 106(3): 202-203, f. 2g-j, 3. 2016.

Figs. 1; 2a-d

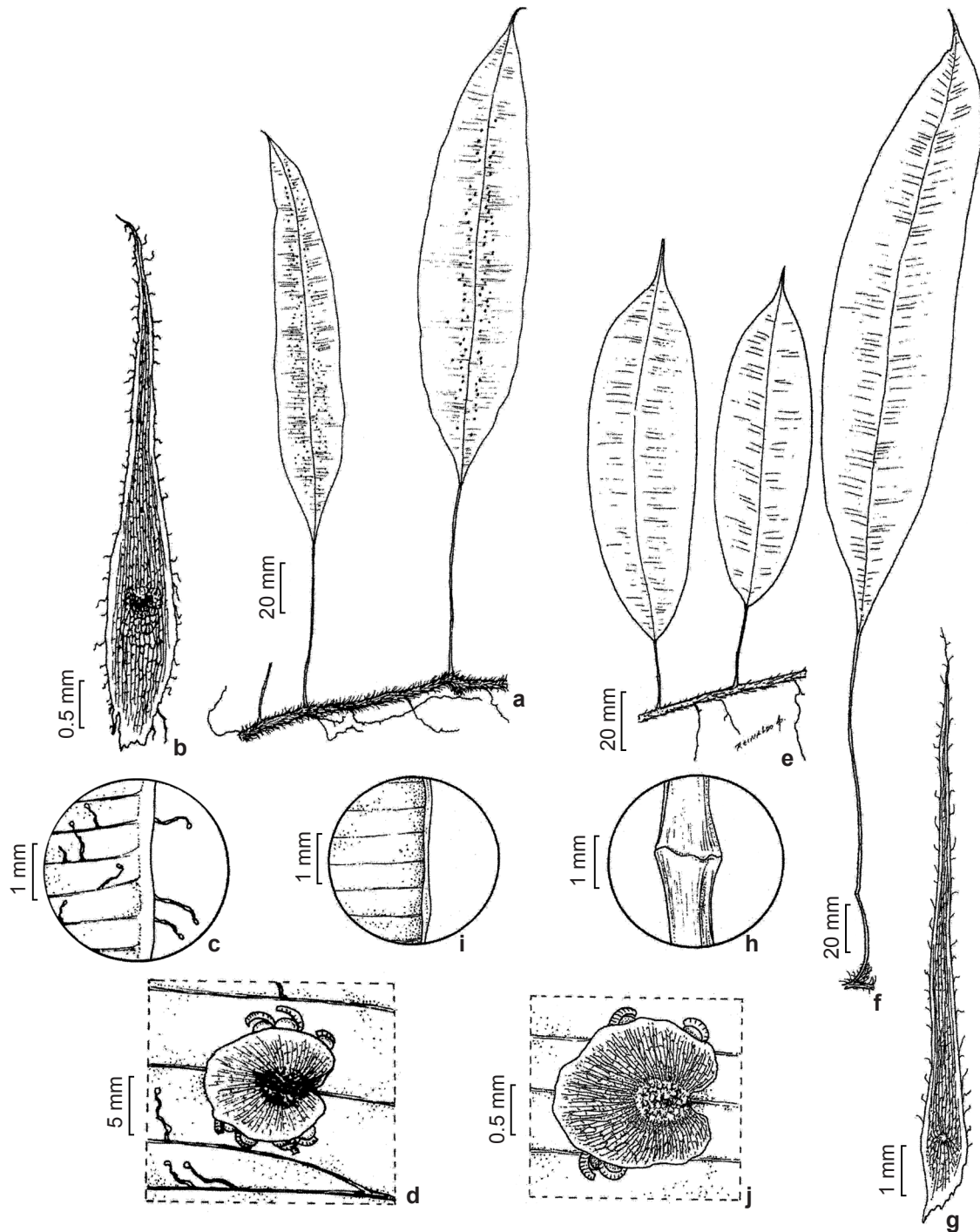
Plants rupestral. Rhizomes light brown, not pruinose, 1–3.5 mm diam. with rhizophore-like roots; scales spreading, bicolorous, centrally black, orange at the margins, densely glandular-ciliate. Phyllopodia 15–20 mm long. Fronds sparse, 18–30 cm long; petioles (2–)3–5.5 cm long, stramineous to brown; laminae elliptic, cuneate at base, acuminate or aristate at apex, 15–25 × 2–4.2 cm; midribs with 4–7-celled catenate hairs and 4–7-celled glandular hairs on both sides, lacking scales; veins free, with catenate and glandular hairs on both sides; laminar tissue between the veins abaxially glabrous, adaxially with sparse catenate and glandular hairs; laminar margins cartilaginous, with glandular hairs and a few catenate hairs; sori infra-medial; indusia orbicular-reniform, bicolorous, centrally dark brown, light brown at the margins, glabrous; spores light brown.

**Specimens examined:** Vargem Alta, ES-164, Km 332, 20°39'26.7"S, 41°0'20"W, 663 m, 23.I.2011, J.R. Pirani et al. 6209 (SP, SPF); Morro Branco, 20°39'28"S, 41°0'18"W, 640 m, 17.IX.2015, P.B. Schwartsburd & C.V. Miranda 3522 (FI, NY, RB, SP, UC, UPCB, VIC-on 2 sheets); 20°39'26"S, 41°0'19"W, 660 m, 17.IX.2015, P.B. Schwartsburd & C.V. Miranda 3525 (SP, VIC).

*Oleandra quartzitica* is known only from three populations at the type locality. Apparently, it is a narrow endemic species, but further collections are needed, especially in Southern Espírito Santo. It has been found in the same habitat of *O. brasiliiana*: in the mountains of quartz (*morros de sal*) of Vargem Alta, as rupestral on quartzitic boulders.

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**Figure 2** – a-d. *Oleandra quartziticola* – a. habit; b. rhizome scale; c. detail of lamina abaxially and laminar margin; d. detail of sori and indusium. e-j. *O. brasiliana* – e. habit; f. habit; g. rhizome scale; h. articulation between phyllopodium and petiole; i. detail of lamina abaxially and laminar margin (from a mature glabrescent specimen); j. detail of sori and indusium. (a-d. Schwartzburd 3522; e,h-j. Schwartzburd 2516; f. Duarte 9767; g. Matos 377).

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