



## *Sticherus salinoi*, a New Species of *Sticherus* (Gleicheniaceae, Polypodiopsida) from Brazil

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### Abstract:

*Sticherus salinoi*, a new species of Gleicheniaceae from Brazil, is here described, illustrated, and compared to its most similar species. An identification key to the Neotropical species of *Sticherus* with glabrous segments is also presented.

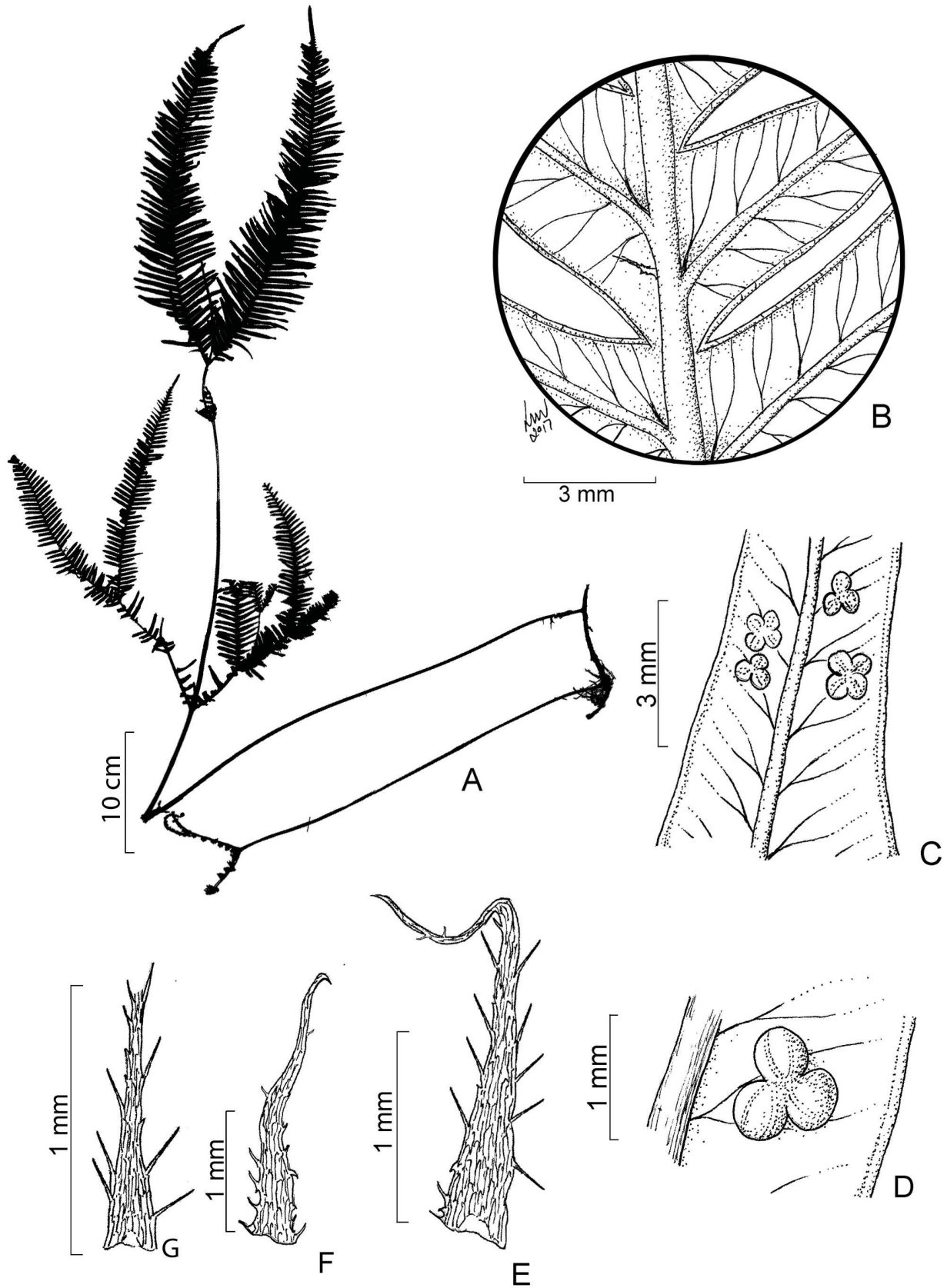
**Key words:** Caatinga, Ferns, Flora of Brazil, Piauí, Serra da Confusão

### Introduction

During the preparation of a taxonomic revision of Gleicheniaceae in Brazil, we found a specimen of *Sticherus* (Presl 1836) that did not match any of the species described in previous treatments (e.g., Sturm 1859, Sehnem 1970, Windisch 1994, Barros & Pietrobom 2005, Barros & Xavier 2009, Santiago 2015 for Brazil; Sodiro 1893, Østergaard Andersen & Øllgaard 2001 for Ecuador; Underwood 1907, Moran 1995 for Mesoamerica; Vareschi 1969, Duek 1975, Smith 1985, 1995, Ortega 1991 for Venezuela; Stolze 1976 for Guatemala; Duek 1976 for Cuba; Proctor 1985 for Jamaica; Smith 1981, Mickel & Beitel 1988, Palacios-Ríos 1992, Mickel & Smith 2004 for Mexico; Lellinger 1989 for Costa Rica, Panama, and the Chocó (Colombia); Tryon & Stolze 1989 for Peru; and Gonzales & Kessler 2011 for the Neotropics). This new species is here described and illustrated. *Sticherus* is a pantropical genus (Gonzales & Kessler 2011) with ca. 95 species (PPG I 2016), of which ca. 12 occur in Brazil (Lima & Salino, in prep.). It is monophyletic, although sampling to date has been limited (Perrie *et al.* 2007, PPG I 2016). Further molecular studies are needed to elucidate the phylogenetic relationships within the genus. It differs from other Neotropical genera of Gleicheniaceae by having rhizomes and buds with scales (vs. hairs), and ultimate branches pinnatifid to pinnate (vs. bipinnate) (Gonzales & Kessler 2011). The species described here is one of the ten Neotropical species of *Sticherus* with glabrous segments. The other species are: *Sticherus gracilis* (Martius 1834: 107) Copeland (1947: 27), *Sticherus gnidioides* (Mettenius 1864: 226) Nakai (1950: 18), *Sticherus hypoleucus* (Sodiro 1883: 8) Copeland (1947: 28), *Sticherus hastulatus* (Rosenstock 1912: 274) Nakai (1950: 18), *Sticherus intermedius* (Baker 1887: 24) Chrysler (1944: 483), *Sticherus jamaicensis* (Underwood 1907: 258) Nakai (1950: 31), *Sticherus lechleri* (Mettenius ex Kuhn 1869: 167) Nakai (1950: 21), *Sticherus orthocladus* (Christ 1905: 16) Chrysler (1944: 483), and *Sticherus pallescens* (Mettenius 1864: 267) Vareschi (1969: 180). A key to distinguish these species is provided below.

### Materials & Methods

Specimens of all above-mentioned species of *Sticherus*, including type material, were studied at B, BHCB, BM, BR, K, M, MG, NY, P, and TEPB. The terms used for description follow Lellinger (2002), and the frond terms of Gleicheniaceae follow Østergaard Andersen & Øllgaard (1996) with some modifications.



**FIGURE 1.** *Sticherus salinoi*. A. Habit. B. Detail of abaxial surface of rachis and segments showing venation. C. Abaxial surface of segment showing venation and sori. D. Sori detail. E. Bud scale. F. Rhizome scale. G. Rachis scale.

## Taxonomic treatment

*Sticherus salinoi* L.V.Lima, *sp. nov.*—Type: BRAZIL. Piauí: Caracol. Parque Nacional da Serra das Confusões, gruta do Riacho do Boi, 430 m, 19 July 2012, *R.S. Fernandes 771* (holotype BHCB!, isotypes CESJ!, MG!, TEPB!).

Plants terrestrial. Rhizomes long-creeping, 2.15–3.0 mm diam., without squamophores, densely covered by golden, rigid, triangular scales, these 1–1.5 mm long, with setose margins, attenuate apices, and cordate bases. Fronds up to 0.8 m, maybe longer, petioles glabrous, 2.1–2.9 mm diam. Laminae up to 3 times forked, often with small, trifid pseudostipules restricted to the first branches. Buds covered with linear to narrow-triangular, orange-red scales, these 1–1.4 mm long, with setose margins, filiform apices, and truncate bases. Ultimate branches elliptic, 15–28.5 × 2.8–5 cm, apices long-caudate, bases cuneate, with gradually reduced segments, the most proximal segments reduced to auricles. Rachises adaxially glabrous, abaxially orange-red, lustrous, with extremely sparse, caducous, hyaline to stramineous, linear to narrowly triangular scales, these 0.4–0.6 mm long, with setose margins, filiform to attenuate apices, and truncate bases. Segments linear, ascendant, 0.3–2.9 × 0.24–0.31 cm, abaxial surface glabrous, midvein slightly flexuous, margins plane, adaxial surface glabrous. Sori medial, paraphyses lacking, spores monolete.

**Distribution**—*Sticherus salinoi* is known only from the type collection, Piauí state, northeastern Brazil, where it grows in cracks of sandstone formations in the Caatinga domain. This is one of the most poorly collected regions of Brazil, which may explain the sole collection. Sampling efforts in remote or poorly sampled neotropical areas have resulted in numerous new fern records, especially in regions considered to be unsuitable habitats for ferns and lycophytes such as the dry Caatinga domain (Almeida & Salino 2016).

**Notes**—*Sticherus salinoi* is most similar to *S. lechleri* (Ecuador, Peru and Bolivia) and *S. intermedius* (endemic to Costa Rica), with which it shares trifid pseudostipules and glabrous ultimate segments. It differs from both mainly by having ultimate branches with long-caudate, entire apices, and segments fully adnate to the rachises. *Sticherus lechleri* has rhizomes with squamophores (vs. squamophores absent in *S. salinoi*), large trifid pseudostipules, rachises moderate to densely scaly (vs. rachis glabrous or sparsely scaly in *S. salinoi*), and segments patent (vs. segments ascendant in *S. salinoi*) with slightly revolute margins (vs. margins plane in *S. salinoi*). Moreover, the rachis scales of *S. salinoi* are usually half the size of the bud scales, have margins with setose projections, and are very sparsely distributed on the abaxial surface of the rachises, while in *S. lechleri* the rachis scales are usually the same size as the bud scales, the margins are ciliate, and they are well distributed along the abaxial surface of the rachises. The bud scales of *S. salinoi* differ from those of *S. lechleri* by having bases truncate, margins with setose projections, and apices filiform, while in *S. lechleri* the bases are slightly cordate, the margins are irregularly ciliate, and apices fimbriate. *Sticherus intermedius* has medium-sized trifid pseudostipules on the primary and secondary ramifications (vs. small trifid pseudostipules restricted to the first ramification in *S. salinoi*), ultimate branches pinnatifid or rarely short-caudate (vs. ultimate branches long-caudate in *S. salinoi*), bases with more than 4 pairs of reduced segments, but not reduced to auricles, proximal segments short-petiolulate with both sides auriculate (vs. bases with several pairs of segments reduced to auricles, not petiolate, and fully adnate to the rachis in *S. salinoi*), glabrous, brownish rachises (vs. very sparsely scaly, orange-red rachises in *S. salinoi*), and segments patent with revolute margins (vs. segments ascendant with plane margins in *S. salinoi*). Furthermore, besides the characters used in the key, *S. salinoi* also differs from *S. jamaicensis* by the golden rhizome scales (vs. reddish-brown in *S. jamaicensis*), elliptic ultimate segments (vs. linear to lanceolate in *S. jamaicensis*), and rachises almost glabrous (vs. densely covered by reddish scales in *S. jamaicensis*). Regarding the other Brazilian species of the genus, *S. salinoi* is similar to *S. gracilis*, but differs from it mainly by the golden rhizome scales (vs. dark-brown scales in *S. gracilis*), bases of the ultimate branches with very reduced segments (vs. truncate base in *S. gracilis*), and ultimate segments four or five times longer than those of *S. gracilis*.

**Etymology**—The epithet is a tribute to Alexandre Salino (1965–), one of the foremost experts on Brazilian ferns and lycophytes, for his contribution to the knowledge of these plants.

## Key to Neotropical species of *Sticherus* with glabrous segments

1. Segments up to 2 cm long .....2
- Segments longer than 3 cm .....4
2. Segments triangular ..... *S. gnidioides*
- Segments linear .....3
3. Bud scales with ciliate margins; plants from Brazil ..... *S. gracilis*
- Bud scales with almost entire margins, occasionally toothed near the apex; plants from Central America and Central Andes.....  
..... *S. hypoleucus*
4. Rachises scaly abaxially .....5

|     |   |                       |
|-----|---|-----------------------|
| -   | Rachises glabrous abaxially .....   | 8                     |
| 5.  | Rachises with ovate scales, restricted to the basal part of the ultimate branches.....                                | <i>S. pallescens</i>  |
| -   | Rachises with triangular to short-triangular scales, spread throughout.....   | 6                     |
| 6.  | Rhizomes with squamophores; proximal branches lacking segments .....  | <i>S. lechleri</i>    |
| -   | Rhizomes without squamophores; proximal branches bearing segments .....   | 7                     |
| 7.  | Rachises densely covered by scales; segments patent to slightly retroflexed, plants from Greater Antilles .....       | <i>S. jamaicensis</i> |
| -   | Rachises almost glabrous; segments ascendant, plants from NE Brazil .....   | <i>S. salinoi</i>     |
| 8.  | Rachises straight.....  | <i>S. intermedius</i> |
| -   | Rachises flexuous .....   | 9                     |
| 9.  | Segments strongly retroflexed.....  | <i>S. retroflexus</i> |
| -   | Segments patent.....  | 10                    |
| 10. | Segments fully adnate to the rachis; acroscopic side of segment bases larger than the basioscopic .....               | <i>S. orthocladus</i> |
| -   | Segments short-petiolate, at least the proximal ones; acroscopic side of segment bases equal to the basioscopic ..... | <i>S. hastulatus</i>  |

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