



## A new hybrid and further taxonomic notes on Brazilian tree ferns (Cyatheaceae)

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### Abstract

We here describe a new hybrid within the *Cyathea corcovadensis*-complex: *C. ×stella-matutina* (*C. corcovadensis* s. str. × *C. microdonta*). We also characterize another two Cyatheaceae species from Brazil: *C. mexiae* (≡ *Trichipteris gardneri*), which has been long overlooked, and *Alsophila salvinii*, an Andine species recently discovered in Brazil. We provide descriptions, illustrations and comments for the three taxa. We also provide a key to the *C. corcovadensis*-complex, an updated key to species of *Alsophila* from Brazil, one lectotypification, and anatomical section images of the pinnule articulations of *C. ×stella-matutina* and its putative parents.

### Resumo (Português)

Neste trabalho é descrito um novo híbrido pertencente ao complexo “*Cyathea corcovadensis*”: *C. ×stella-matutina* (*C. corcovadensis* s. str. × *C. microdonta*). Também são caracterizadas duas espécies de Cyatheaceae do Brasil: *C. mexiae* (≡ *Trichipteris gardneri*), que vinha sendo ultimamente ignorada, e *Alsophila salvinii*, recentemente descoberta no Brasil. São providos descrições, ilustrações e comentários sobre os três táxons, bem como uma chave para o complexo “*Cyathea corcovadensis*”, uma chave atualizada para as espécies de *Alsophila* ocorrentes no Brasil, uma lectotipificação, e imagens de seções anatômicas da articulação das pinulas de *C. ×stella-matutina* e seus prováveis progenitores.

### Introduction

Brazil is home to 46 species of scaly tree ferns (Cyatheaceae), including two “mini-tree” ferns formerly treated under the genus *Hymenophyllopsis* Goebel (1929: 3) (Christenhusz 2009, Salino & Almeida 2009, Windisch 2010, Windisch & Santiago 2015). Among these 46 tree ferns, five are currently ascribed to the genus *Alsophila* Brown (1810: 158), 40 to *Cyathea* Smith (1793: 416) *sensu stricto* (see Lellinger 1987) and one to *Sphaeropteris* Bernhardt (1801: 122), (Tryon 1971). In the Brazilian Atlantic Forest east of the Dry Diagonal (composed of the Cerrado and Caatinga; see, for example, Schwartsburd *et al.* 2014: Fig. 3A), 28 tree fern species occur, most of them endemic to the area (Windisch & Santiago 2015). The history of settlement in the area and the concomitant botanical activity there led to abundant but usually fragmentary collections of tree ferns. These then formed the basis for descriptions of new species by taxonomists who often had not seen the plants in the field. Evaluating which names represent valid natural species and which are just varieties or hybrids requires extensive field work and thorough study of complete collections. Consequently, there are still two widespread and not well-understood species complexes, one centered on *Cyathea corcovadensis* (Raddi (1819: 228) Domin (1929: 262), the other on *C. phalerata* Martius (1822: 146).

The *Cyathea corcovadensis*-complex is characterized by conform lamina apices (*i.e.*, lamina apices that resemble pinnae of the same leaf), and conform pinna apices (*i.e.*, pinna apices that resemble pinnules of the same pinnae). In addition, the laminae are usually bipinnate (*i.e.*, entire pinnules), both the pinnae and pinnules are articulate, and the forked veins arise directly from costae (in the other Brazilian *Cyathea* spp., pinnate costules arise from costae). There were nearly a dozen taxa recognized in this complex (*e.g.*, Raddi 1825, Fée 1873, Brade 1951, Sehnem 1978), but in the last three decades they have been reduced to “a single variable species” (Barrington 1978, Fernandes 1997, 2003,