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Parapyricularia brasiliensis, a new dematiaceous hyphomycete on *Gmelina arborea* from Brazil

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Abstract—The new species *Parapyricularia brasiliensis* was observed on leaf spot of *Gmelina arborea* in Brazil. *G. arborea* is a plant species of Asian origin that was introduced into Brazil. *P. brasiliensis* differs from the previously described species of the genus based mainly on the number of branches of the conidiophore (two to four), length of conidiophore stipe, a protuberant conidial hilum, and conidial length and septation.

Key words— systematics, tropical fungi

Introduction

A hyphomycete was observed on a leaf spot of *Gmelina arborea* Roxb. (*Verbenaceae*). *Gmelina arborea* has its center of origin in tropical and sub-tropical areas of Asia. Due to its rapid growth rate, this plant species is often used in reforestation programs in many tropical areas as a source of timber and cellulose (Agrosoft 2000). *Gmelina arborea* was introduced into Brazil from Asia in the 1960s during a reforestation project located in the Amazon basin. This fungus was collected during the rainy season of 2003 in the city Recife on the Atlantic coast of the Brazilian state of Pernambuco (08°01'S, 34°56'W). The region is characterized by a tropical climate with an average rainfall of 1500 mm/year and average annual temperature of 26°C (Vianello & Alves 1991). The fungus was collected on hypophyllous leaf spots that were mostly irregular, dark brown, not limited by the leaf veins, and occurring mainly on older leaves.

Materials and Methods

The fungal material examined originated from leaves of two trees that were close to each other. Micromorphological observations were made from material mounted in Shear's

mounting fluid or lacto-glycerol-cotton blue. Morphological data were based on at least 50 measurements of each fungal structure used for taxonomic diagnoses. Histological sections were prepared in order to observe the relationship between the fungus and the host tissue. Images were captured using a Olympus PM – AK 10 camera mounted on a Olympus BX41 microscope. Specimens were deposited in the Mycological Reference Collection of the Herbarium Camille Torrand Collection (URM), Recife, Brazil of the Universidade Federal de Pernambuco.

Taxonomic Description

Parapyricularia brasiliensis A. Silva, M.A.G. Barbosa, M. Menezes, M.P.S. Câmara sp. nov. **FIGURES 1-5**

Maculae amphigenae, coloniae hypophyllae olivaceo-brunnea; mycelium partim superficiales, hyphis ramosis, septatis, laevibus, hyalinis; conidiophori cylindrici, erecti, singulares omnes stipitem et capitulum compositum; cellulis basalibus plus minus inflatis et cellulae conidiogeniae in conidiophoris incorporatae, terminales, sympodiales, denticulatae; conidia singularia in denticulis, obclavata vel obclavato-cylindrica, recta vel subarcuata, pallide olivacea-brunnea, septis 1-8 transversis, 19.5–66 μm longae, 4.5– 6μm latae, hilum parum, distincte incrassato 1 x 1–1.5 μm.

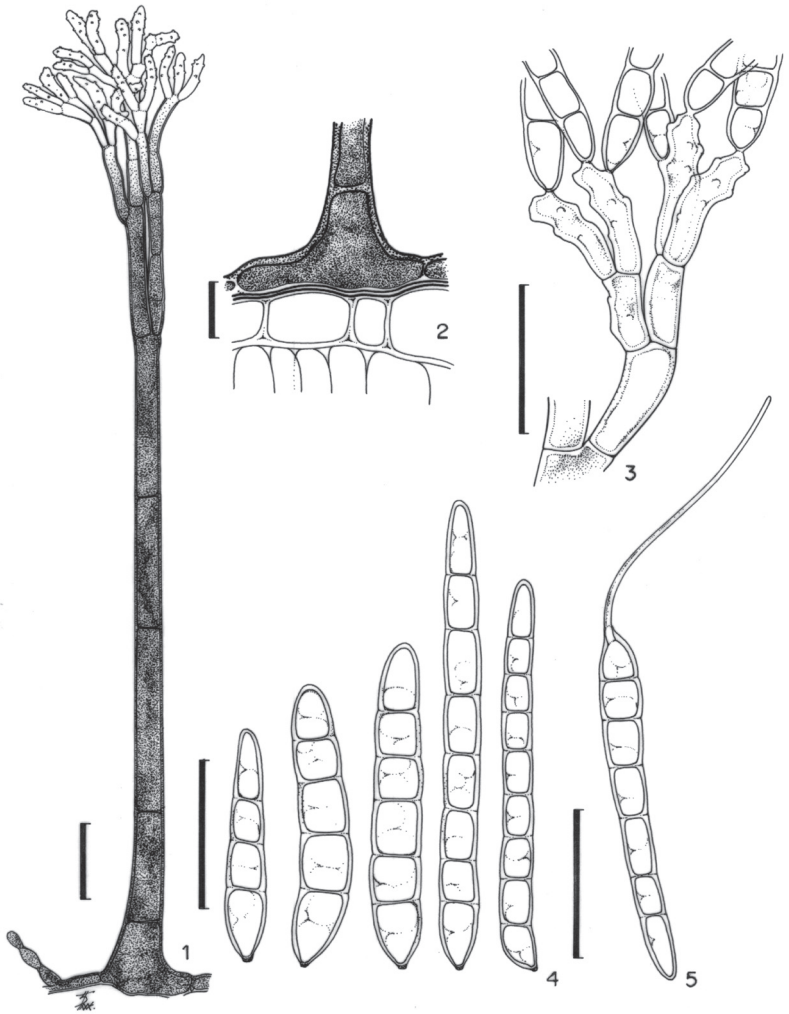
Holotypus hic designatus: In foliis vivis Gmelina arborea. In Universidade Federal Rural de Pernambuco-UFRPE, Recife-PE (URM) deposita.

Etymology: *brasiliensis* refers to Brazil, the country where the fungus was found.

EXPANDED DESCRIPTION — **Leaf spots** dark brown, amphigenous, mostly irregular, and not limited by the leaf veins. **Mycelium** superficial, branched, septate, smooth, hyaline; **Conidiophores** solitary, macronematous, erect, composed of a much-branched fertile head and a sterile stipe, 247– 55 μm long. Stipe 179–418 μm long, straight, smooth, cylindrical, unbranched, septate, thick-walled, dark brown below becoming lighter toward the apex, 7–13 μm wide at base, cells at base not swollen; terminating in the fertile head. Fertile head terverticellate, compact; 1° and 2° branches cylindrical, straight (11.5–72 × 4.0–7 μm) brown to pale brown. 3° and 4° branches cylindrical, straight, short, (12–23.5 × 4.5–7.5 μm), pale brown. **Conidiogenous cells** arising from 3° and 4° branches singly or in appressed whorls of 2 or 3, cylindrical, polyblastic, denticulate; denticles cylindrical, (1×1–1.5μm), truncate. **Conidia** acropleurogenous, solitary, obclavate, straight or slightly curved, smooth, thick-walled, hilum protuberant, pale brown, with 1–8 transverse septa (19.5–66 × 4.5–6 μm), germination polar.

REPRESENTATIVE SPECIMENS EXAMINED — BRASIL. PERNAMBUCO: Universidade Federal Rural de Pernambuco, Recife ($08^{0}01'$ S, $34^{0}56'$W) (HOLOTYPE-URM *78637*) — 20.IV.2003 A.M.F. Silva on leaves of *G. arborea* Roxb.

COMMENTS — The fungus is characteristic of *Parapyricularia* M.B. Ellis, a genus of dematiaceous hyphomycetes. *Parapyricularia* is characterized by macronematous, mononematous conidiophores composed of a sterile stipe and a complex head of branches, each of which terminates in one or more polyblastic, denticulate conidiogenous cells. Conidia are acropleurogenous, solitary, simple, straight or curved, 1–3 (usually 2) septate, pale brown, rarely brown, smooth, and have a protuberant hilum (Ellis &



FIGS. 1–5. *Parapyricularia brasiliensis* 1. Conidiophore showing stipe and terverticellate head 2. Transverse section of the leaf of *Gmelina arborea* showing the superficial conidiophore of *P. brasiliensis* 3. Conidiogenous cells with conidia attached to denticles 4. Conidia 5. Polar conidial germination. Scale bars: 1,2 = 25 μm; 3-5 = 15 μm.

Peregrine 1972). Two species of *Parapyricularia* have been described, both from Asia. *Parapyricularia musae* was originally described from *Musa* sp. (Ellis & Peregrine 1972) and *P. gymnematis* from *Gymnema tingens* Roxburgh ex Sprenger (Rai & Kamal 1985). The Brazilian species differs significantly from the previously described species

of the genus and is proposed as new. Conidiophores of *P. brasiliensis* are typical of the genus in possessing a distinct sterile stipe and a compact, fertile head and denticulate conidigenous cells. *Parapyricularia* resembles *Pyricularia* but conidiophores of that genus are not branched (Ellis 1976).The fertile head of *Parapyricularia* also suggests *Periconiella*, but conidiogenous cells in that genus bear cicatrized scar (Ellis 1976).

Parapyricularia brasiliensis can be distinguished from the other described species in this genus by a number of characters (Table 1). It differs from *P. gymnematis* in that *P. brasiliensis* has some superficial mycelium, non-fasciculate conidiophores with no swollen basal cell, and longer and wider stipes than *P. gymnematis*. Additionally, the conidiophore heads of *P. brasiliensis* are more highly branched and conidia are shorter than those of *P. gymnematis,* and conidia of *P. brasiliensis* have a rounded base, thick wall, 1–8 septa, and a protuberant hilum. *Parapyricularia brasiliensis* can be distinguished from *P. musae* by the shorter and thicker stipe, smaller size of the primary branches and a more highly branched head in the former. In addition, the conidia of *P. brasiliensis* are longer and narrower and have more transverse septa than those *P. musae*. Conidia of both, *P. brasilensis* and *P. musae* have a protuberant hilum.

A search of the extensive host/fungus list in Farr et al. (2004), which includes Teng's Fungi of China (1996), reveals species in 34 fungal genera have been found on *G. arborea* but none of the hyphomycetes suggests the genus *Parapyricularia*. Because the two known species of *Parapyricularia* were described in Asia and the host plant of *P. brasiliensis* was introduced into Brazil from that continent in the 1960's we can only speculate that the species described here was introduced in Brazil together with its host.

The disease symptoms associated with the presence of the fungus are very minor and no attempt to fulfill the Koch's postulate was made.

Table 1. Morphological characteristics of *Parapyricularia* species.

Species	**Conidiophores (μm)**	**Conidia**		
		Size (μm)	**Septa**	**Shape**
P. brasiliensis	Stipe 179–418 × 7.0–13, primary branches 18.5–72 × 4.0–6.5	19.5–66 × 4.5–6	1–8, transverse	Obclavate, hilum protuberant and dark
P. gymnematis	Stipe 64.5–195.5 × 5.7–6.8, primary branches 16–85 × 4.6–6.8	27.5–82.8 × 4–6.3	1–6, transverse	Obclavate to obclavato-cylindric, hilum not protuberant but slightly thickened and dark
P. musae	Stipe up to 1000 × 5–9, primary branches up to 120 × 4–6	27–33 × 7–10	1–3, transverse	Obturbinate to obclavate, hilum protuberant

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