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Short Communications

A *Tropicoporus* species among the types of *Fulvifomes swieteniae*

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Abstract

Fulvifomes swieteniae, is considered a synonym of *F. cedrelae* based on morphological, molecular, and ecological data. The type materials of *F. swieteniae* were revised in this work and based on our morphological observations and a reappraisal of the literature, the holotype fits the taxonomic concept of *F. cedrelae*, while the paratype corresponds to *Tropicoporus linteus*. Given these facts, the paratype of *F. swieteniae* is determined as *T. linteus* by perennial basidioma with a hyphal system that is monomitic in the context and dimitic in the trama of the tubes, hymenial setae, and colored basidiospores that become darker in KOH solution.

Key words: accurate identification, Hymenochaetaceae, morphological features, taxonomy, type revisions.

Resumo

Fulvifomes swieteniae é considerada sinônimo de *F. cedrelae* com base em dados morfológicos, moleculares e ecológicos. Os materiais tipo de *F. swieteniae* foram revisados neste trabalho e com base em nossas observações morfológicas e reinterpretação da literatura, o holótipo da espécie se enquadra no conceito taxonômico de *F. cedrelae*, enquanto o parátipo se trata de *Tropicoporus linteus*. Diante desses fatos, o parátipo de *F. swieteniae* é determinado como *T. linteus* por seu basidioma perene com sistema hifal monomitico no contexto e dimitico na trama dos tubos, setas himeniais e basidiósporos coloridos que escurecem em solução de KOH.

Palavras-chave: identificação precisa, Hymenochaetaceae, características morfológicas, taxonomia, revisão de tipos.

Fulvifomes swieteniae Murrill is characterized by basidiomata with a slightly cracked pileal surface, a context with dark lines and small pores (5–8 pores/mm) and basidiospores (4–5 × 3.5–5 µm), and is found on dead trunks of *Swietenia mahagoni* (L.) Jacq. in Cuba (Murrill 1915; Lowe 1957; Larssen & Coob-Poulle 1990). When Murrill (1915) described this species he designated two type specimens which are F. S. Earle & W. A. Murrill 545 (NY 776502) as the holotype and J. K. Brace 4389 (NY 985681) as the paratype. Only the holotype of *F. swieteniae* has been used for morphological revisions and comparisons in subsequent works (Lowe 1957; Salvador-Montoya *et al*. 2022). Consequently, Salvador-Montoya *et al*. (2022) synonymized *F. swieteniae* within *F. cedrelae* (Murrill) Murrill based on morphological (holotype comparisons), molecular, and ecological data.

Additionally, during a study of *Fulvifomes* Murrill species, we revised the paratype of *F. swieteniae* designated by Murrill in 1915. For macro-morphological observations, the size, shape, and color of the basidiomata (pileal surface, context, tubes and dissepiments), as well as characteristics of the tubes and pore surface

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(number of tube layers and pores per millimeter), were observed. Colors were determined following Kornerup & Wanscher (1978). Microscopic examination was performed on freehand sections of specimens mounted in water, 5% potassium hydroxide solution (KOH), and Melzer's reagent (IK) (following Ryvarden 1991). All microscopic measurements (n = 40) and drawings were made in KOH. When giving the size range of the microscopic elements, 5% of the measurements were excluded from each end and are given in parentheses. To describe the hyphal system, sections of the tube trama and context of the basidiomata were carefully dissected under a stereomicroscope after incubation in 5% (v/w) sodium hydroxide solution (NaOH) for 48h at 40 °C (see Drechsler-Santos *et al*. 2016), and examined under optical microscopy.

The specimen NY 776502 (holotype of *F. swieteniae*) presents a context with dark lines, a pore surface with 5–6 pores/mm, a hyphal system that is a monomitic in the context and dimitic in the tubes, a hymenium without setae and subglobose to broadly ellipsoid basidiospores with a flattened side (4.5–5.5 × 3.5–4.5 µm) that are thick-walled and yellowish and become darker in KOH solution. However, the specimen NY 985681 (paratype of *F. swieteniae*) has a context without dark lines, a pore surface with 6–7 pores/mm, a hyphal system that is a monomitic in the context and dimitic in the tubes, a hymenium with subulate to ventricose hymenial setae (20–35 × 6–7 µm), and subglobose to broadly ellipsoid basidiospores with a flattened side (5.5–6 × 4.5–5 µm) that are thick-walled and yellowish and become darker in KOH solution.

Based on our results, the specimen NY 776502 fits the morphological concept of *Fulvifomes*. This genus is characterized by a context with or without dark lines, a monomitic to dimitic hyphal system, absence of setae, and subglobose to ellipsoid and colored basidiospores, occasionally with a flattened side that become darker in KOH solution (Wagner & Fischer 2002; Zhou 2014; Drechsler-Santos *et al*. 2016; Salvador-Montoya *et al*. 2018a). However, unlike the holotype of *F. swieteniae* (NY 776502), the specimen NY 985681 (paratype of *F. swieteniae*) presents different characteristics to a *Fulvifomes* species such as hymenial setae (Fig. 1).

Species with a hyphal system that is monomitic in the context and dimitic in the tubes, hymenial setae and colored basidiospores are present in *Tropicoporus* L.W. Zhou, Y.C. Dai & Sheng H. Wu and *Sanghuangporus* Sheng H. Wu, L.W. Zhou & Y.C. Dai (Zhou *et al*. 2016; Wu *et al*. 2022). Based on a reappraisal of the literature, we noted that specimen NY 985681 fits the morphological concept of *Tropicoporus linteus*

Figure 1 – a-b. Morphological features of the specimen NY 985681 (paratype of *F. swieteniae*) – a. basidioma; b. ventricose hymenial setae. Scale bars: a = 2 cm; b = 10 µm.

(Berk. & M.A. Curtis) L.W. Zhou & Y.C. Dai. Currently, *T. linteus* is characterized by perennial basidiomata with a context without dark lines, a pore surface with 5–7 pores/mm, a hyphal system that is monomitic in the context and dimitic in the tubes, hymenial setae that are ventricose or subulate (22–30 × 4–7 µm), and subglobose to broadly ellipsoid (4.8–5.5 × 3.9–4.6 µm) thick-walled, yellowish basidiospores (Dai & Xu 1998; Tian *et al*. 2013; Wu *et al*. 2022). In addition, *T. linteus* is distributed in Central America and the Caribbean (Tian *et al*. 2013; Zhou *et al*. 2016; Wu *et al*. 2022), and correlatively, specimen NY 985681 was collected in the Bahamas.

Basidiospores with a flattened side that become darker in KOH solution are observed in specimen NY 985681. In *Tropicoporus*, *T. drechsleri* Salvador-Montoya & Popoff presents these characteristics (Salvador-Montoya *et al*. 2018b). However, *T. drechsleri* has a dark line in the context (Salvador-Montoya *et al*. 2018), whereas the dark line is absent in specimen NY 985681 (Fig. 1). Therefore, based on the results of this work, and a reappraisal of the literature, specimen NY 985681 is determined as *T. linteus* and must not be considered as the paratype of *F. swieteniae*. Furthermore, we emphasize the importance of the detailed shape of the basidiospores, and the reaction of the basidiospore wall in KOH solution as well, to describe species in *Tropicoporus*.

Material examined: *Fulvifomes cedrelae*: Cuba, Alto Cedro, Santiago de Cuba, on *Swietenia mahagoni*, 19-20. III.1905, *F.S. Earle & W.A. Murrill 545* (NY 776502!, as holotype of *F. swieteniae*). *Tropicoporus linteus*: Bahamas, Acklin's Island, Gold Rock, 21.XII.1905-6.I.1906, *L J.K. Brace 4389* (NY 985681!, as paratype of *F. swieteniae*).

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Data availability statement

In accordance with Open Science communication practices, the authors inform that there is no data sharing of this manuscript.

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