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Resolving *Tiarosporella* spp. allied to Botryosphaeriaceae and Phacidiaceae

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Abstract

The type species of the genus *Tiarosporella*, *T. paludosa*, is epitypified and confirmed as a member of the Botryosphaeriaceae. Based on morphology and DNA sequence data of the large subunit nuclear ribosomal RNA gene (LSU, 28S) and the internal transcribed spacers (ITS) and 5.8S rRNA gene of the nrDNA operon, the genus *Tiarosporella* is shown to be poly- and paraphyletic. A group of isolates morphologically similar to *T. paludosa* cluster to the Phacidiaceae (Phacidiales, Leotiomycetes) and we accommodated them in *Darkera*, a genus associated with needle diseases of conifers, with *D. picea* introduced as a novel taxon. This new taxon includes isolates occurring on needles of *Picea* spp. in Europe (Finland, Norway and Switzerland) and differs from *D. parca* according to a five-locus alignment consisting of ITS, LSU, partial 18S nuclear ribosomal RNA, translation elongation factor 1-alpha and beta-tubulin genes. Four novel genera are introduced for tiarosporella-like fungi, namely *Eutiarosporella* based on *E. tritici* on *Triticum aestivum* from South Africa, *Marasasiomyces* based on *M. karoo* on *Eriocephalus* sp. from South Africa, *Mucoharknessia* based on *M. cortaderiae* on *Cortaderia selloana* from Argentina, and *Sakireeta* based on S. *madreeya* on *Aristida setacea* from India. Together with the genus *Botryobambusa*, these genera represent a subclade in the Botryosphaeriaceae that is ecologically diverse, occurring on *Poaceae*, as well as woody hosts, including endophytes, saprobes, and plant pathogens.

Keywords: coelomycetes, Dothideomycetes, ITS, LSU, Phacidiales, systematics

Introduction

Several coelomycetous genera with appendaged, hyaline conidia are members of the Botryosphaeriales, namely *Phyllosticta* (Phyllostictaceae; Wikee *et al*. 2013), *Melanops* (Melanopsaceae; Slippers *et al*. 2013), *Kellermania* (Planistromellaceae; Minnis *et al.* 2012), *Macrophomina* (Sarr *et al*. 2014), *Alanphillipsia, Botryobambusa, Botryosphaeria* and *Pseudofusicoccum* (Botryosphaeriaceae; Crous *et al*. 2006, 2013, Liu *et al*. 2012, Phillips *et al*. 2013). Many other genera also belong to the *Botryosphaeriales*, e.g. *Tiarosporella* (Crous *et al.* 2006), but due to a lack of cultures and DNA data, these connections have largely remained unconfirmed.

A genus allied to *Tiarosporella* is *Neottiospora,* based on *N. caricina* (Desmazières 1843), which was introduced for coelomycetes with pycnidial conidiomata, phialidic conidiogenous cells, and hyaline, unicellular conidia with evanescent mucoid appendages (Nag Raj 1973). In a re-examination of type material by Subramanian & Ramakrishnan (1957), they observed *Neottiospora* to have a conidial appendage, and considered it similar to the genus *Tiarosporella*, which was introduced by Von Höhnel (1919), based on *T. paludosa*. The appendage in *Neottiospora* was, however, shown to be basal by Nag Raj (1993), in contrast to the apical appendage observed in *Tiarosporella.* The genus *Tiarospora*, based on *T. perforans*, is again distinguished from these genera by having 1-septate conidia, with bipolar appendages (Nag Raj 1993). Subramanian & Ramakrishnan (1957) also introduced the genus *Sakireeta*, based on *S. madreeya*, which has plurilocular conidiomata formed in a stroma. Furthermore, Subramanian (1961) introduced the

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