Shiraiaceae, new family of Pleosporales (Dothideomycetes, Ascomycota)

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Abstract

Shiraia bambusicola is an economically important medicinal fungus on bamboo. In this paper we re-describe the holotype and designate an epitype based on fresh specimens collected from Zhejiang Province in China. Morphological characters agree with those of the holotype and phylogenies based on combined partial LSU-rDNA, EF and RPB gene sequence data from the epitype, suggest that it is a new family of Pleosporales. The new family is introduced and the holotype and epitype are both illustrated.

Key words: asexual state, bamboo, new family, phylogeny, taxonomy, traditional Chinese Medicine

Introduction

The genus Shiraia was introduced by Hennings (1900) based on Shiraia bambusicola Henn. and has remained monotypic until now. Shiraia bambusicola is parasitic on branches of several species of bamboo, and is distributed in the southern region of China and in Japan (Kishi et al. 1991). Ascostromata of this taxon are used as a traditional Chinese medicine and is of medicinal importance because of the metabolite hypocrellin, which has promising applications in photodynamic therapy (PDT) for anti-cancer treatments (Deininger et al. 2002, Miller et al. 2008, Yang et al. 2001, Zhang et al. 1998).

The genus Shiraia was initially placed in the family Nectriaceae (Hennings 1900), but was transferred by Saccardo (1902) to the Hypocreaceae (Hypocreales) based on its large persistent ascostromata, which was considered to be one of the characteristics of this family. This classification was subsequently followed by Dai (1979), Rogerson (1970) and Teng (1934). Amano (1980) observed the isotype specimen, and concluded that the fungus does not have unitunicate asci as described by Hennings (1900). Amano (1980) transferred Shiraia to the order Pleosporales because it has bitunicate asci and its centrum is of the Pleospora type. However, Amano (1983) referred the genus to Dothideales. Subsequently, most researchers (Lumbsch & Huhndorf 2010, Zhang et al. 2012), place Shiraia in Dothideales incertae sedis.

Previous classifications of Shiraia were mainly based on morphological characteristics of ascostromata, asci, and ascospores, and sequence data available in GenBank was from the ITS region. Based on rDNA sequence data Cheng et al. (2004) showed that Shiraia should be classified in Pleosporales. More recently, Shiraia was segregated as an unpublished family, Shiraiaceae, in GenBank (see taxonomy of S. bambusicola in NCBI); this family name has not yet been validly published.