



Delimitation of taxa in *Amauroderma* (Ganodermataceae, Polyporales) based in morphology and molecular phylogeny of Brazilian specimens

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Abstract

From 2007 to 2014, specimens of *Amauroderma* were collected mostly in North and Northeast Brazil. Additionally, material deposited in herbaria was reviewed. The analysed specimens represented 20 species, six of them new to science: *Amauroderma albostipitatum*, *A. floriformum*, *A. laccatostipitatum*, *A. ovisporum*, *A. sessile* and *A. subsessile*. Twelve species, three of them new, had their ITS and/or LSU region of the DNA sequenced. According to the results, *Amauroderma* is not monophyletic; *A. partitum* and *A. schomburgkii* are macro-morphologically variable species; the synonym of *A. calcigenum* with *A. partitum* is not supported, and the use of macro- and micro-morphological characters is a useful tool to delimit species of the genus.

Key words: Agaricomycetes, diversity, rDNA sequences, poroid fungi, taxonomy

Introduction

Ganodermataceae (Donk) Donk (1948: 474) is a well circumscribed family due to its double-walled basidiospores, with an inner ornamented wall and a smooth outer one (Ryvarden 1991, 2004a). However, the *Ganoderma*-type of basidiospores seems to be derived from smooth, cylindrical spores of Polyporaceae Corda (1839: 49) (Ryvarden 1991, Hibbett & Donoghue 1995, Moncalvo *et al.* 1995a, Tham 1998) and the acceptance of Ganodermataceae as a family has yet to be discussed. As presently accepted, the family includes five genera: *Amauroderma* Murrill (1905a: 366), *Ganoderma* P. Karsten (1881: 17), *Haddowia* Steyaert (1972: 108), *Humphreya* Steyaert (1972: 98) and *Tomophagus* Murrill (1905a: 197). *Amauroderma* currently accommodates tropical, stipitate to sessile species with non-truncate, globose to subglobose, verrucose to asperulate (smooth in only one species) basidiospores (Ryvarden, 2004a). This combination of characteristics distinguishes *Amauroderma* from the other four genera, as *Ganoderma*, *Humphreya* and *Tomophagus* have truncate and *Haddowia* crested basidiospores (Ryvarden 2004a, Le *et al.* 2012). *Amauroderma* is considered as parasitic on the roots of living trees (Ryvarden 2004a) and comprises about 30 species of tropical distribution, of which 22 are reported in Brazil (Kirk *et al.* 2008, Gugliotta *et al.* 2015).

The identification of species of *Amauroderma* is traditionally based on macro- and micro-morphological characteristics, such as: the presence/absence of laccate surfaces, size of pores in the hymenial surface, consistency and colour of the basidiomata, presence/absence of resinous bands in the context; type of ornamentation, size and shape of basidiospores and type of pilear cover (Furtado 1981, Ryvarden 2004a). However, at least for *Ganoderma*, little correlation between rDNA gene phylogeny and morphology was found. On the other hand, a correlation was observed between gene phylogeny and characteristics of mycelia in culture, geographic origin and/or host relationships, and mating systems (Moncalvo *et al.* 1995b, Gottlieb *et al.* 1998, 2000, Hong & Jung 2004, Buchanan & Moncalvo 2008, Douanla-Meli & Langer 2009). More recently, molecular studies have shown that some of those morphological characteristics, at least for laccate *Ganoderma* and *Tomophagus*, are useful to circumscribe some species (Cao *et al.* 2012, Kinge *et al.* 2012, Le *et al.* 2012, Lima-Júnior *et al.* 2014).