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Leucoagaricus viridariorum (*Agaricaceae*, *Agaricales*), a new species from Spain

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Abstract

Leucoagaricus viridariorum is proposed as a new species based on material collected in different areas of Spain. This taxon is characterised macroscopically by its small, whitish basidiomes, minutely squamulose-fibrillose pileus, evanescent ascendant annulus and growth in man-made environments. Microscopically, its subglobose to broadly ellipsoid spores, the clavate cheilocystidia and the trichodermic pileipellis are diagnostic. Based on molecular data of the internal transcribed spacer of nuclear ribosomal DNA (nrITS) this species belongs to the *Leucoagaricus/Leucocoprinus* clade of the *Agaricaceae* where it is sister to *Leucoagaricus amanitoides*.

Keywords: *Agaricomycetes*, *Basidiomycota*, lepiotoid fungi, phylogeny, taxonomy

Introduction

Based on morphological and molecular data, several studies have demonstrated that the genus *Leucoagaricus* Locq. ex Singer, as other lepiotoid genera in *Agaricaceae*, is polyphyletic (Johnson and Vilgalys 1998; Johnson 1999; Vellinga *et al*. 2003, 2011; Vellinga 2004). Vellinga *et al*. (2003) and Vellinga (2004) showed that species of *Leucoagaricus* and *Leucocoprinus* Pat. were phylogenetically clustered but intermixed within a single clade (the *Leucoagaricus*/*Leucocoprinus* clade). Because of the large number of species in the clade and relatively limited molecular data, a satisfactory conclusion has not yet been achieved to resolve the taxonomy and phylogenetic relationships amongst many taxa of *Leucoagaricus*, *Leucocoprinus* and *Lepiota*. Probably, an increased taxon sampling (with better representation of tropical species) combined with multilocus DNA sequence analyses will lead to either regarding the *Leucoagaricus/Leucocoprinus* clade as one large genus, or splitting it into distinct, smaller monophyletic genera. Regarding this research, a conservative approach is adopted in this study and, according to Vellinga and Davis (2006) and Kumar and Manimohan (2009), we support the major trend of a separate generic status of *Leucoagaricus* and *Leucocoprinus* based on morphological characters (Singer 1986; Vellinga 2001a,b; Kumar and Manimohan 2009). The genus *Leucoagaricus* [type species *L. macrorhizus* Locq. ex E. Horak, now *L. barssii* (Zeller) Vellinga] is delimited by a pileus which is not or hardly plicate, metachromatic spores, absence of clamp-connections, and absence of pseudoparaphyses around basidia (Singer 1986; Vellinga 2001a; Vellinga and Davis 2006); *Leucocoprinus* [type species *L. cepistipes* (Sowerby) Pat.] differs from *Leucoagaricus* mainly in the presence of pseudoparaphyses, and a plicate pileus (Singer 1986; Vellinga 2001b; Vellinga and Davis 2006).

As the new lepiotoid species described here shows a set of morphological features including a non-plicate pileus and absence of pseudoparaphyses, which are distinguishing features of *Leucoagaricus*, therefore, it can be placed within *Leucoagaricus* rather than *Leucocoprinus*. Molecular data of the internal transcribed spacer of nuclear ribosomal DNA (nrITS) further support it as a new and distinct species in *Leucoagaricus*, and close sister to *L. amanitoides* R.M. Davis & Vellinga.