



## *Volutellonectria* (Ascomycota, Fungi), a new genus with *Volutella* anamorphs

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### Abstract

A new genus, *Volutellonectria* with *Volutella* anamorphs is established, based on and typified by *Cosmospora consors*. It is characterized by small, red perithecia which may collapse laterally when dry, a *Cosmospora*-like perithecial wall structure, clavate asci with an apical ring, fusiform ascospores with smooth surface, and growing on decaying plant debris or woody substrates. Two new species are added to the new genus and described as *Volutellonectria asiana* and *V. ciliata*. Phylogenetic analyses of nuclear ribosomal DNA (ITS and 28S partial) strongly support the separation of *Volutellonectria* from *Cosmospora* and some other species with *Volutella* anamorphs in Nectriaceae, as well as recognition of the new species.

**Keywords:** *Cosmospora*, morphology, new species, sequence analyses, teleomorph–anamorph connections

### Introduction

*Cosmospora* Rabenh. is a widespread genus and of significant morphological and ecological diversity among members of Nectriaceae. The genus includes fungi with their ascomata on a thin basal stroma or not, small (usually  $\leq 300$   $\mu\text{m}$  in diam.) and orange to dark red perithecia which are solitary to gregarious, globose to obpyriform, and laterally collapsing or not collapsing when dry. The perithecial wall structure is assumed to be notable among nectriaceous fungi. The walls are thin (usually  $\leq 20$   $\mu\text{m}$  thick) with 1–2 layers and the wall surface is either glabrous or hairy. Cells of the walls are usually irregular in shape and connected by fine pores where they are adjacent. The asci are cylindrical to clavate, 4–8-spored, and with an apical ring or a simple apex. The ascospores are ellipsoid to ovoid, 1(–3)-septate, uniseriate or biseriate within ascus, yellow-brown or hyaline, and with a smooth, spinulose or striate surface. Species of *Cosmospora* occur on various substrates including fungi, scale insects, and herbaceous or woody plants in tropical and temperate regions. Currently *Acremonium* Link, *Fusarium* Link, *Stilbella* Lindau, *Verticillium* Nees and *Volutella* Fr. are known as its anamorphs, and the genus is polyphyletic (Samuels et al. 1991, Rossman et al. 1999, Schoch et al. 2000, Zhang and Zhuang, 2006, Luo and Zhuang 2008). Towards establishment of a monophyletic *Cosmospora*, *Chaetopsinectria* J. Luo & W.Y. Zhuang was published as a segregate genus (Luo and Zhuang 2010b).

*Volutella* is characterized by discoid sporodochia with marginal setae, simple to verticillate conidiophores, compact and phialidic conidiogenous cells, and 1-celled, ovoid to oblong conidia (Rossman and Samuels 1993, Barnett and Hunter 1998, Samuels et al. 2006). Several species have been reported linking to genera of nectriaceous fungi. For example, *V. minima*, *V. buxi* and *V. pachysandricola* are connected with *Cosmospora consors*, *Pseudonectria rousieliana* and *P. pachysandricola*, respectively (Rossman and Samuels 1993, Rossman et al. 1999). In this study, we provide morphological and molecular data on *Cosmospora* species that possess *Volutella* anamorphs.