



## New species of graphidoid and thelotremoid Graphidaceae from Australia

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### Abstract

Four new graphidoid and thelotremoid Graphidaceae are described from Australia, all supported by previously published molecular data. *Fissurina bullata* Mangold, Lücking & Lumbsch differs from other *Fissurina* species in having a strongly bullate thallus with large clusters of calcium oxalate crystals, in combination with a psoromic acid chemistry. *Ocellularia australiana* Mangold, Lücking & Lumbsch is similar to *O. wirthii* in having a white-grey thallus and in containing psoromic acid but differs in the loose cortex and the more irregular ascomata with partly fissured margins and often divided, thickly white-tipped columella, as well as slightly larger ascospores. *Thelotrema fuscobutyle* Mangold, Lücking & Lumbsch was previously confused with *T. subtile* but can be distinguished by the prominent ascomata and in the ascospores becoming pale brown. Finally, *T. inspersoporinaceum* Mangold, Lücking & Lumbsch differs from *T. porinaceum* in having an inspersed hymenium.

**Keywords:** New South Wales, Ostropales, Queensland, *Rhabdodiscus*, *Stegobolus*, Tasmania, Victoria.

### Introduction

Australia is currently the only area for which complete, recent monographic treatments (Archer 2009; Mangold *et al.* 2009) are available for both the graphidoid and thelotremoid taxa of the core Graphidaceae as circumscribed by Rivas Plata *et al.* (2012a). A total of 336 species were reported in these two treatments, compared to 410 listed for India (Singh & Sinha 2010) and 314 reported for Costa Rica (Lücking *et al.* 2008; Sipman *et al.* 2012), with the latter not covering all genera in the family. The diversity of Graphidaceae encountered in Australia is thus fairly high, especially considering that a large portion of this area is situated outside the tropics, and one would therefore expect that most of the species would have been catalogued.

Ongoing studies, however, together with the increasing amount of DNA sequence data helped to refine species circumscriptions and to characterize material which could not readily be identified, continue to provide new information about the taxonomy and distribution of particular species. In the present case, we report four species new to science from various parts of Australia that were either not included in the previous monographic treatments or confused with other species. This supports the notion that most species of Graphidaceae, in particular those taxa confined to well-conserved rain forest, are not widely distributed but are restricted to a particular region, and hence applying names to taxa that suggest a wide, pantropical or even cosmopolitan distribution potentially results in accepting polyphyletic species. For the new species described below, sequence data subsequently became available to support their distinct taxonomic status and elucidated their phylogenetic relationships (Rivas Plata *et al.* 2012b, 2013).

### Material and Methods

The specimens were studied at The Field Museum. Thallus morphology was examined using a LEICA MS5 dissecting microscope. Sections of thalli and ascomata were cut by hand with a razor blade and examined with

## Acknowledgements

Data obtained for this study were gathered as part of two projects funded by the National Science Foundation: *Phylogeny and Taxonomy of Ostropalean Fungi, with Emphasis on the Lichen-forming Thelotremataceae* (DEB 0516116 to The Field Museum; PI H. T. Lumbsch; Co-PI R. Lücking) and *ATM – Assembling a taxonomic monograph: The lichen family Graphidaceae* (DEB-1025861 to The Field Museum; PI T. Lumbsch, CoPI R. Lücking).

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