Molecular phylogeny of the Laboulbeniomycetes (Ascomycota)

Lauren Goldmann, Alex Weir

PII: S1878-6146(17)30162-9
DOI: 10.1016/j.funbio.2017.11.004
Reference: FUNBIO 870

To appear in: *Fungal Biology*

Received Date: 27 June 2017
Revised Date: 13 November 2017
Accepted Date: 16 November 2017

Please cite this article as: Goldmann, L., Weir, A., Molecular phylogeny of the Laboulbeniomycetes (Ascomycota), *Fungal Biology* (2018), doi: 10.1016/j.funbio.2017.11.004.

Molecular phylogeny of the Laboulbeniomycetes (Ascomycota)

Lauren Goldmann[a,]*Alex Weir[b]

[a]Department of Biological Sciences, The State University of New York at Cortland, Cortland, New York, 13045
[b]Department of Environmental and Forest Biology, The State University of New York College of Environmental Science and Forestry, Syracuse, New York, 13210

Abstract A first molecular-based phylogeny is presented for the Laboulbeniomycetes, a group of ascomycete fungi that utilize arthropods for nutrition and/or dispersal. Morphological diversification and life-history evolution has made it difficult to resolve relationships within the group, and to identify close relatives. Here, we infer a preliminary phylogeny based on acquisition of 51 new SSU rDNA sequences, representing a total of 65 taxa. The results of this study demonstrate that Laboulbeniomycetes is monophyletic, and related to Sordariomycetes. The class could be divided into at least 4 or 5 orders, though we refrain from formally giving names to these at this stage. Further evidence for the occurrence of asexuality within the class is provided by the inclusion of the genera *Chantransiopsis* and *Tetrameronycha*, both known only as asexual taxa with thalli consisting of linearly superposed cells. The precise placement of the genus *Herpomyces* (Herpomycetaceae), on cockroaches, remains unresolved in our analysis, but lies outside of the main clade of sexually reproducing Laboulbeniales. There is good support for this latter grouping, comprising taxa that are found on both aquatic and terrestrial hosts. Within this large assemblage, we recognize 5 distinct clades (clades E, F, G, H, I). Relationships among the so-called "aquatic genera" (≡ Ceratomycetaceae + some Euceratomycetaceae) are poorly resolved in our analyses, accounting for 3 of these clades (E, F, G), with the remainder of the taxa (largely equivalent to Laboulbeniaceae) split into two major groupings (clades H, I). Across all taxa, antheridial characteristics, features on which the earliest classifications were based, are shown to be homoplastic. On the other hand, features of perithecial development show an overall