

<b>Dissertation Title</b>	Phylogeny of Ascomycetes From Palms
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## **ABSTRACT**

Palm fungi are a taxonomically diverse group, with more than 1770 described species (340 Basidiomycota and 1430 Ascomycota have been described from palm substrates), with representatives from almost all major fungal classes. The non-lichenized ascomycetes which have been described from palms are a very diverse assemblage with 1059 species distributed in 121 families and 436 genera, and their lifestyle ranges from saprobic, pathogenic, and endophytic to parasitic. A checklist of non-lichenized ascomycetes described from palms is provided. Most of the previous studies, only focused on morphology, and few phylogenetic studies have been carried out on palm fungi. Molecular phylogenetic studies of palm fungi are needed as the taxonomic placements of some genera/families are unresolved. By employing molecular approaches based on the ex-type and ex-epitype cultures, as well as the morphological studies of the type specimens, a better understanding of this group can be established.

In this study, phylogeny of Dothideomycetes was investigated. A class-wide phylogenetic assessment of Dothideomycetes was carried out based on the multi-gene (LSU, SSU, *TEF1* and *RPB2*) analysis in order to provide a natural classification. This involved selecting and clarifying types and ex-types of most genera in the class,

making new collections from Europe and Thailand and using existing and novel sequence data. The phylogenetic tree presents 22 orders including 64 families (the current accepted families are 105) in Dothideomycetes, and it provides a working document for Dothideomycetes.

Type specimens of the genus *Astrosphaeriella* and families *Botryosphaeriaceae* and *Roussoellaceae* were examined; cultures were isolated from fresh collections. Phylogenetic and taxonomic studies of these taxa were carried out based on the multi-gene analysis and examination of types. The phylogenies showed that *Astrosphaeriella* was polyphyletic with species in *Fissuroma* and *Neoastrosphaeriella*, and *Astrosphaeriella*-like taxa clustering in four clades, two clades, including species with slit-like ostioles, clustered in *Aigialaceae*; the clade that includes the generic type clustered together with *Delitschia*; and *Astrosphaeriella afrocana*, which has striate ascospores, deviated from these three clades and had a basal position in the Pleosporales. With phylogenetic and morphological study, a natural classification of Botryosphaeriales is provided, and 29 accepted genera with 20 genera represented by molecular data were assigned to this order; the asexual and sexual morphs are linked to some genera. It is also suggested that there is more than one family in Botryosphaeriales; the phylogeny showed that the genera *Aplosporella*, *Melanops*, *Phyllosticta* and *Saccharata* formed distinct clades from *Botryosphaeriaceae* within Botryosphaeriales. In addition, the phylogeny showed that the *Roussoella*-like taxa formed a distinct clade within the *Pleosporales*; the *Roussoellaceae* clade can be distinguished into three well-supported sections, namely *Roussoella/Roussoellopsis*, *Roussoella* and *Neoroussoella*. Based on both morphology and phylogenetic analyses, and a new family *Roussoellaceae* was introduced to accommodate *Roussoella*, *Roussoellopsis* and *Neoroussoella*.

**Keywords:** Checklist/Dothideomycetes/Palm fungi/Phylogeny/Taxonomy/Types