Dissertation Title	Peat Swamp Palm Ascomycetes
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ABSTRACT

Peat swamp forests are unique ecosystems due to their high species diversity and significant role in maintaining a stable global climate. They function as carbon sinks, storing twice as much carbon as all global forest biomass. Beyond carbon storage, peatlands offer valuable benefits. They play vital roles in the water cycle, storing and filtering water and mitigating floods by slowing peak flows. Home to diverse plants and animals, these wetlands support millions of people. These habitats support many flora, including an extensive number of bryophytes, ferns, and palms (Arecaceae). In peat swamp forests, many palm species, including *Eleiodoxa conferta*, can be found, exerting various biological functions. However, this unique habitat is increasingly threatened by deforestation and land-use changes. There are few records of fungal studies in these environments, most of which have been reported from Thailand. The peat swamp forests in Narathiwat, southern Thailand, represent the last remaining primary peat swamp ecosystem in the country. However, studies on microfungi in these habitats remain limited and mostly lack molecular data. Therefore, in the current study, we aimed to investigate fungal species from peat swamp forests in Thailand, focusing on different palm materials, with an emphasis on *Eleiodoxa conferta*, based on morphology and phylogeny. Additionally, we examined one of the dominant palm fungal taxa, *Xylariales*, from non-palm hosts. For this study, fungal samples were collected from ten different hosts, including *Caryota mitis*, *Cyrtostachys renda*, *Eleiodoxa conferta* (the predominant palm species), *Eugeissona tristis*, *Licuala paludosa*, *Quercus kingiana*, and *Swietenia macrophylla*. Morphology and multi-gene phylogenetic analyses (ITS, LSU, SSU, mtSSU, *act*, *rpb*2, *tub*2, *tef1-α*) were used for taxa identification. Taxonomic classification, illustrations, and detailed descriptions for

each taxon are provided. From this research, we introduced one new family, one new genus, 34 new species and 25 new host, habitat and geographical records. Fungi from 19 orders within *Sordariomycetes*, *Dothideomycetes*, and *Leotiomycetes* were recorded. The orders include *Amphisphaeriales*, *Annulatascales*, *Botryosphaeriales*, *Cancellidiales*, *Chaetosphaeriales*, *Conioscyphales*, *Distoseptisporales*, *Helotiales*, *Hypocreales*, *Natipusillales*, *Pleosporales*, *Pleurotheciales*, *Pseudodactylariales*, *Rhytismatales*, *Savoryellales*, *Sporidesmiales*, *Tubeufiales*, Venturiales, and Xylariales. The fungal taxa investigated belong to 26 families, viz., *Amphisphaeriaceae*, *Annulatascaceae*, *Apiosporaceae*, *Astrosphaeriellaceae*, *Botryosphaeriaceae*, *Cancellidiaceae*, *Chaetosphaeriaceae*, *Conioscyphaceae*, *Diatrypaceae*, *Distoseptisporaceae*, *Hypocreaceae*, *Hypoxylaceae*, *Lophiostomataceae*, *Megacapitulaceae*, *Natipusillaceae*, *Oxydothidaceae*, *Pleurotheciaceae*, *Rhytismataceae*, *Savoryellaceae*, *Sporidesmiaceae*, *Striatiguttulaceae*, *Sympoventuriaceae*, *Tetraplosphaeriaceae*, *Tubeufiaceae*, *Vamsapriyaceae*, and *Xylariaceae*. The results of this study contribute to the understanding of microfungi in Thailand by providing additional morphological and phylogenetic evidence for their taxonomic placement. In addition to morphological data, we have generated sequence data for each taxon to address the lack of molecular data from previous studies. This has led to a more accurate taxonomic placement, enhancing our understanding of fungal diversity in peat swamp forests, which remain largely understudied worldwide. This study highlights the rich biodiversity of peat swamp forests, particularly in association with *Eleiodoxa conferta*, emphasizing the importance of conserving these unique ecosystems. The fungal specimens obtained in this study have been deposited in herbarium and culture collections, serving as valuable resources for future research in fungal taxonomy and the exploration of their biomaterial properties.

Keywords: Ascomycota, Dothideomycetes, Sordariomycetes, Peat Swamp Forest, Taxonomy, Phylogeny