Dissertation Title	Microfungi in Thai Coastal Wetlands: Insights into Freshwater Poales
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ABSTRACT

Wetlands are diverse ecosystems that provide numerous ecological niches and support long-term stability through biodiversity, nutrient cycling, and balanced ecosystem processes. In Thailand, coastal freshwater wetlands are largely dominated by Poales, a major monocot group that originated in the mid-Cretaceous and rose to global ecological importance in the Oligocene. Key families such as Poaceae, Cyperaceae, Juncaceae, and Typhaceae occupy varied habitats, support whole ecosystems, and supply major agricultural crops. Their fungal associations contribute to nutrient cycling, plant health, and ecosystem resilience, yet studies on microfungal diversity in tropical wetland Poales remain limited. This study therefore investigates saprobic microfungi associated with dominant Poales families in coastal freshwater wetlands of central and southern Thailand, providing taxonomic data, detailed morphology, illustrations, and an updated review of Ascomycota in these habitats.

Decomposing emergent and submerged plant materials were collected from wetlands in Khao Sam Roi Yot, Pran Buri, and Narathiwat, and a polyphasic approach was used for fungal identification. The study discovered 14 novel species new to science, including *Bambusicola loticola, Beltrania typhacearum, Distoseptispora paracrassispora, Distoseptispora pranburensis, Jalapriya saccata, Hongkongmyces typhacearum, Paraphaeosphaeria siamensis, Phaeoisaria pranburensis, Phaeoacremonium bambusae, Sporidesmium siamense, Poaceascoma fluviale, Stagonospora narathiwatensis, Tetraploa fusiformis,* and *Triadelphia parafusiformis*. In addition, 35 other species were recorded as new host or geographical records. Detailed descriptions, illustrations, and updated phylogenetic analyses are provided for each taxon. The distribution of saprobic microfungi across host families, and their ecological adaptations and geographical patterns, are also

discussed. This study highlights the high microfungal diversity in coastal freshwater wetlands of Thailand and supports future fungal taxonomic research in these ecosystems.

Research on the vertical distribution of saprobic fungi associated with Poales in Thailand's wetlands remains limited. In this study, decomposing material of *Typha angustifolia*, an invasive wetland plant with both submerged and aerial parts, was examined to assess vertical patterns of microfungal communities in Pran Buri and Khao Sam Roi Yot wetlands, Prachuap Khiri Khan Province. Sampling targeted three plant segments: (1) aerial leaves near the tip, (2) the portion between the tip and waterline, and (3) submerged leaves below the water surface. Fungi were identified using morphology and multigene phylogeny, and each taxon was recorded by vertical level.

From 360 samples, 73 saprobic genera were recorded. The middle segment showed the highest richness (48 genera; $H' = 3.4452$), while the aerial segment was least diverse (34 genera; $H' = 3.0412$). ANOVA ($Pr(>F) = 0.224$) showed no significant difference in α-diversity among levels. β-diversity analyses indicated distinct communities: Bray–Curtis showed the highest similarity between aerial and middle parts, and Sørensen showed the lowest dissimilarity between middle and submerged parts. PERMANOVA revealed significant compositional differences (39% and 35% explained by Bray–Curtis and Sørensen), while PERMDISP confirmed these were not due to dispersion. Generalist fungi occurred across all levels, while Halosphaeriaceae, Diplocladiella, and Jalapriya were restricted to submerged parts. Overall, the middle segment functioned as a transitional zone. Heatmaps, boxplots, and NMDS ordinations support these findings.

Keywords: Aquatic Fungi, α-diversity, β-diversity, Freshwater Fungi, Fungal Ecology, Fungal Taxonomy, Habitat Filtering