Dissertation Title	Microfungi Associated with Tropical and Subtropical Palms (*Arecaceae*) in China and Thailand
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ABSTRACT

Tropical regions harbor one-third of global fungal biodiversity, yet many areas, particularly in Asia, remain underexplored. Palms (Arecaceae), thriving in these climates as culturally and ecologically significant monocots, support rich tropical biodiversity and host diverse fungal communities. Over the past three decades, extensive studies have revealed numerous novel palm-associated fungi at the species, genus, and higher taxonomic levels. However, these valuable records remain scattered and often lack DNA sequences or preserved specimens. This study consolidates global data from 1990 to 2025 to comprehensively analyze the diversity, distribution, and host associations of palm-associated fungi. In addition, fresh samples were collected from southern China and southern Thailand between 2021 and 2024. A total of 105 well-preserved collections were obtained from Guangdong, Guangxi, Jiangxi, and Yunnan provinces in China, and Narathiwat Province in Thailand. Based on morphological characteristics and multi-locus phylogenetic analysis, these collections were identified as belonging to 27 orders (including four *incertae sedis* within Dothideomycetes), 51 families, and 70 genera (including one *incertae sedis* genus each in Pleosporales and Sordariales, and six in Xylariales) within Ascomycota. Among these, six new families were identified: Cannoniaceae, Ganzhomycetaceae, Ganzhofusosporaceae, Leucocellomycetaceae, Pseudoconlariaceae, and Sporodochyalomycetaceae. The genera *Calamomyces*, *Ganzhomyces*, *Ganzhofusospora*, *Leucocellomyces*, *Pseudoconioscypha*, *Proliferirostrum*, *Sporodochyalomyces*, and *Tropicomicromyces* are described here as new. In total, 61 new species and 44 new records are introduced. For all introductions, detailed descriptions, illustrations, and phylogenetic analyses are provided. Additionally, two new combinations,

Tropicomicromyces magnoliae and *Tropicomyces palmae* are proposed based on morphological and multi-locus phylogenetic evidence. A comprehensive global checklist of palm-associated fungi, comprising 6,099 detailed records from 1990 to 2025, is included in this study. Using East Asia as a focal point, we integrated these data to assess fungal diversity and host preferences. Based on weighted global records, the estimated total number of palm-associated fungal species ranges between 44,509 and 72,136. Host preferences were categorized into three groups: typical, atypical, and suspected. To unify data access, we developed palmfungi.org, an interactive platform integrating host, geographic, and taxonomic information to bridge traditional and modern research. This study fills critical knowledge gaps, standardizes scattered data, establishes a foundation for studying host specificity, and highlights the urgent need for further exploration in tropical regions. Furthermore, results from this study consolidate global knowledge on palm-fungal relationships, enable exploration of host specificity, ecological trends, and sustainable applications, and foster collaboration among taxonomists, ecologists, and pathologists to advance understanding of the roles of palm fungi in biodiversity and ecosystem health.

Keywords: 105 Saprobic Collections, 61 New Species, Six New Families, Eight New Genera, Palm Fungal Checklist, Fungal Diversity, Phylogeny, Taxonomy, Platform