Dissertation Title Taxonomy and Phylogeny of Selected Hyphomycetes with Emphasis on *Alternaria*

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ABSTRACT

Hyphomycetous fungi consisting of asexual morph of various species in Ascomycetes, partially in Basidiomycetes. Which characteristic as simple structures mostly consist of conidiophores, conidiogenous cell and conidia. Dothideomycetes to be the largest class in Ascomycetes, that contains vary of hyphomycetous fungi in high diversity. Hyphomycetous fungi also occur in other orders in Ascomycetes, such as Sordariomycetes and Eurotiomycetes. In addition are distributed worldwide, including pathogen, saprophytes and parasites on plants, animals, fungi, and some abiotic medium as air, water, dregs, soil and etc. As with most organisms, although hyphomycetes in tropical and subtropical area are researched, the future study on hyphomycetes in this area is still expected. However, recently, the research of hyphomycetous fungi in tropical and subtropical, such as in Great Mekong River Subregion (GMS) System is still lacking of reported. Following the the gradual development of GMS, fungi investigation in these regions is necessary.

This study aims to focus on taxanomy and phylogeny of hyphomycetes in ecological habitats of the temperate, subtropical and tropical environment. The hyphomyctous fungal species in ecosystem of this area are given main priority. To determine and investigate hyphomycetous fungi species on fresh specimens were collected from this area, were then morphological examined and cultural isolated, while their DNA

sequence data from rDNA (ITS, LSU and SSU) and protein cording genes (TEF-1α, RPB2 and GAPDH) were analyzed to convinced their identifications and to better evaluate their phylogenetic affinities and classifications. Consequently, a new family *Zygosporiaceae*, three new genus *Fusiconidium, Mariophialophora* and *Sporidesmioides*, and 24 new species (*Acremonium chiangraiensis, Alternaria doiliconidium, A. italica, Curvularia palmicola, Corynespora doipuiensis, Dendryphion hydei, Fusiconidium mackenziei, F. aquaticum, Helicomyces menglunicus, Lophium zalerioides, Marinophialophora garethjonesii, Myrothecium northernthailandicum, Periconia palmicola, Pseudocercospora maetaengensis, P. rosacearum, Pseudopithomyces palmicola, Torula chiangmaiensis, T. chiangmaiensis, T. hydei, T. mackenziei, T. pluriseptata, Seifertia shangrilaensis, Sporidesmioides thailandica, Vamsapriya breviconidiophora*), three new records *Hermatomyces sphaericus* (*H. chromolaenae*), *H. krabiensis* (*H. chiangmaiensis*), and *Nigrospora oryzae* were reported respectively in Dothideomycetes, Sordariomycetes and Eurotiomycetes.

The study also focus on revisiting of *Alternaria* sp. in *Pleosporaceae* (Dothideomycetes) and offer a better taxonomic relationship of this genus, in the aspects of taxonomy, phylogeny and preliminary evolution divergence. As a result, 24 new species viz. *Alternaria arctoseptata, A. arundinis, A. baoshanensis, A. breviconidiophora, A. brevirostra, A. ellipsoconidia, A. eupatoriicola, A. falcata, A. lathyri, A. macilenta, A. macroconidia, A. minimispora, A. muriformispora, A. nodulariconidiophora, A. oblongoellipsoidea, A. obpyriconidia, A. orobanches, A. ovoidea, A. phragmiticola, A. phytolaccae, A. pseudoinfectoriae, A. rostroconidia, A. salicicola* and *A torilis* spp. nov. are proposed and classified in sect. *Alternaria*, sect. *Infectoriae*, sect. *Porri* and sect. *Radicina*. *Alternaria alternata* and *A. doliconidium*, with new host and geographical records are also described. The further explores the utility of divergent time estimates to gain additional insights into the evolutionary relationships of *Alternaria*.

Moreover, the current study introduces new species and new records with DNA sequence data which can be used to understand the taxonomy and biodiversity of

hyphomycetes fungi in Ascomycetes. Moreover, The DNA sequence data from different gene regions from new collections were generated, properly annotated and upload to deposited in GenBank, and the alignments and phylogenetic trees were upload to deposited in TreeBASE for future phylogenetic studies. Indeed, the sample examinations and descriptions of each taxa were deposited in Faces of Fungi. New taxa were registered in Index Fungorum and Mycobank. This research provide comprehensive morphology as well as molecular sequences of mass hyphomycetes in diverse taxa, and outcrop significant species of hyphomycetes in GMS and Europe ecosystem habitats. The sequences data of different hyphomycetes species were provided while their taxonomy was established.

Keywords: *Alternaria*, Evolutionary Divergence, Eurotiomycetes, Dothideomycetes, Hypomycetes, Morphology, New Taxa, Phylogeny, Sordariomycetes