

Dissertation Title	Biodiversity of Helicosporous Hyphomycetes in China
Author	Jian Ma
Degree	Doctor of Philosophy (Biological Science)
Advisor	Adjunct Prof. Kevin David Hyde, Ph. D.
Co-Advisor	Assoc. Prof. Yong-Zhong Lu, Ph. D.

ABSTRACT

Helicosporous hyphomycetes are a fungal group with similar coiled or spiral conidial morphology but significant differences in genetic information which has resulted in them being distributed in different phyla, classes, orders, and families. However, there are no comprehensive studies for this group. In this study, I have systematically organized the helicosporous taxa, revised their classification and provided a modern taxonomic framework based on both morphology and phylogeny. This group encompasses 113 genera and 472 species distributed in three phyla, ten classes, 20 orders and 25 families, while some taxa are classified as *incertae sedis* within Ascomycota. The illustrations and notes for all helicosporous genera and the drawings of the type or representative species which have not been collected and examined are provided. Additionally, a phylogenetic taxonomic distribution of helicosporous families based on maximum likelihood analysis of LSU, ITS, SSU, *tef1- α* , and *rpb2* sequence data is provided. In addition, 184 new collections were obtained from China. Based on molecular evidence and morphological characteristics, seven new helicosporous genera *viz.* *Acrogenihelicosporium*, *Hyalohelicoon*, *Hyalohelicotubeufia*, *Hyalohelisphora*, *Pseudocirrenalia*, *Pseudohelicosporium*, and *Pseudotubeufia*, and 67 new species, *viz.* *Acrogenihelicosporium abundatum*, *A. aquaticum*, *A. guizhouense*, *A. viridisporum*, *Berkleasmium hainanense*, *Helicoma brunneum*, *H. catenatiphorum*, *H. guizhouense*, *H. liyui*, *H. sclerotiferum*, *H. tropicum*, *H. wuzhishanense*,

H. yinggelingense, *H. yunnanense*, *Helicosporium acropleurogenum*, *H. brunneisporum*, *H. changjiangense*, *H. hainanense*, *H. jiangkouense*, *H. latisporum*, *H. liuzhouense*, *H. multidentatum*, *H. nanningense*, *H. ramosiphorum*, *Helicotubeufia laxisporum*, *Hyalohelicoon multiseptatum*, *Hyalohelisphora lignicola*, *Neohelicomyces acropleurogenus*, *N. aseptatus*, *N. edgeworthiae*, *N. guttulatus*, *N. guizhouensis*, *N. hainanensis*, *N. helicosporous*, *N. hydei*, *N. lignicola*, *N. macrosporus*, *N. qixingyaensis*, *N. xiayadongensis*, *N. yunnanensis*, *N. baihualingense*, *Neohelicosporium hainanense*, *N. jianfenglingense*, *N. latisporum*, *Parahelicomyces latisporus*, *P. laxisporus*, *P. parvisporus*, *Paratrimmatostroma helicosporum*, *Pleurohelicosporium brunneisporum*, *Pl. multiseptatum*, *Pseudocirrenalia aquialpina*, *Pseudohelicosporium irregular*, *P. laxisporum*, *Pseudotubeufia dematiolaxispora*, *Ps. hyalospora*, *Ps. laxispora*, *Sclerococcum astrictum*, *Tubeufia acropleurogena*, *T. baomeilingensis*, *T. denticulate*, *T. guttulata*, *T. hainanensis*, *T. helicomina*, *T. liyui*, *T. subrenispora*, *T. tropica*, and *Troposporella guttulata* are introduced. Additionally, 38 new records and 21 known species are reported. Furthermore, we synonymize 30 species and provide 30 new combinations. Complete descriptions, illustrations, notes, and phylogenetic trees based on maximum likelihood and Bayesian analyses of LSU, ITS, mtSSU, SSU, *tef1- α* , and *rpb2* sequence data are also provided for the new taxa, new combinations, new records, and known species. A worldwide checklist comprising the distribution, habitat, and availability of molecular data for the accepted helicosporous species is also provided.

Keywords: 96 New Taxa, 113 Helicosporous Genera, 472 Species, 184 New Collections, 30 New Combinations, Asexual Morph, Checklist, Phylogenetics, Saprobic Fungi