Dissertation Title	Dothideomycetes Updated Morpho-phylogenetic Classification and Taxonomic Appraisal of Genera
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ABSTRACT

Dothideomycetes is the largest and most diverse fungal class of ascomycetes, comprising approximately 20,000 species classified into 50 orders, 226 families and 1941 genera (including 267 genera *incertae sedis*). Species in this class are characterized mainly by bitunicate asci with fissitunicate dehiscence and comprise different fungal lifestyles, including saprobes, plant pathogens, endophytes, epiphytes, fungicolous, lichenicolous, lichenized and rock-inhabiting fungi. The current study provided a monograph on Dothideomycetes, accepting ten orders (Aureoconidiellales, Capnodiales, Cladosporiales, Comminutisporales, Dothideales, Mycosphaerellales, Myriangiales, Neophaeothecales, Phaeothecales, and Racodiales), 30 families and 452 genera in Dothideomycetidae. Furthermore, four orders (Gloniales, Hysteriales, Mytilinidiales, and Pleosporales), 97 families and 739 genera were recognized in Pleosporomycetidae. Numerous orders and families that could not be assigned to the two defined subclasses were referred to as orders and families *incertae sedis* in Dothideomycetes. In this study, 36 orders comprising 59 families and 390 genera were recognized as orders *incertae sedis*, and 40 families comprising 93 genera were designated as families *incertae sedis*. We bring together recently published information and attempt to link morphological data to the findings resulting from molecular analyses from published papers. The present study has increased our knowledge from

37 orders, 209 families and 1495 genera (246 genera *incertae sedis*) in 2020 to 50 orders, 226 families and 1941 genera (including 267 genera *incertae sedis*) in 2024. We provided updated notes on all 1941 generic types in Dothideomycetes up to the end of 2022. Each genus has an updated description and notes on its importance and distribution. In addition to these, estimated numbers of species for each genus and the number of species with molecular data are provided. The morphology of each genus is illustrated by photographic plates from the type specimens, or from collections with sequence data. The current study designated reference specimens for *Melaspileella proximella*, *Yoshinagaia quercus* and *Yoshinagella japonica* and one epitype for *Saccothecium sepincola*. This research also provided an up-to-date outline of Dothideomycetes.

The current study also established three new families (*Dubujianaceae*, *Endosporiaceae*, *Macrovalsariaceae*), one new genus (*Melanocamarosporioides*), twenty new species (*Acrospermum urticae*, *Angustimassarina camporesii*, *Ascochyta clinopodiicola*, *Comoclathris galatellae*, *Foliophoma camporesii*, *Holmiella junipericola*, *Holmiella juniperi-semiglobosae*, *Leptosphaeria regiae*, *Leptosphaeria urticae*, *Melanocamarosporioides ugamica*, *Muriphaeosphaeria angustifoliae*, *Neodidymelliopsis camporesii*, *Neomicrosphaeropsis juglandis*, *Nodulosphaeria thalictra*, *Sporormurispora paulsenii*, *Subplenodomus urticae*, *Thyrostroma alhagi*, *Thyrostroma ephedricola*, *Valsaria ostryae*, *Xenodidymella camporesii*), thirteen new host and geographical records, *Thyrostroma jaczewskii* comb. nov. as a new combination and one lectotype specimen, *D. nudum* Vain for *Didymocyrtidium* based on morphology and multi-gene phylogenetic analyses.

This study also addressed the problems and challenges associated with studying Dothideomycetes and provided basic guidelines for classifying species using existing species recognition criteria, employing morphological, biological, ecological and phylogenetic approaches. Serving as an update for the genera of Dothideomycetes, this

study provides a baseline for future research in the field. Additionally, an online database, dothideomycetes.org, was established from this study and will be continuously updated to reflect current literature, incorporating new data and supplementary information as it becomes available.

Keywords: Ascomycetes, Morphology, Species, Specimen