Dissertation Title	Microfungi Isolated from *Rosa roxburghii* and Other Hosts with Emphasis on Biodiversity, Taxonomy and Phylogeny of Botryosphaeriales
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ABSTRACT

Rosa roxburghii and *R. sterilis* are important economic fruit crops in southwestern China, widely cultivated for their nutritional and medicinal value. However, studies on saprobic fungi associated with these hosts remain scarce, and their taxonomic and phylogenetic relationships are poorly understood. In this study, extensive field surveys were conducted from 2019 to 2023 across 22 sites in Guizhou, Sichuan, and Yunnan Provinces, China, resulting in the isolation of 227 fungal specimens. Morphological examinations combined with multi-locus phylogenetic analyses (ITS, LSU, SSU, *tef1α*, *tub2*, and *rpb2*) of the isolated specimens revealed remarkable fungal diversity. My results introduce one new family (Pseudoneodictyosporiaceae), eight new genera, and 43 new species, along with seven new combinations. The newly described species are *Acrocalymma rosae*, *A. rosicola*, *Amorocoelophoma guizhouensis*, *Am. rosae*, *Am. sichuanensis*, *Anteaglonium rosae*, *Aurantiascoma rosae*, *Brunneofusispora rosae*, *Chaetosphaeria rosae*, *Chromolaenicola rosae*, *Cylindrotrichum rosae*, *Cytospora rosae*, *Floricola rosae*, *Fusivaginella rosae*, *Heleiosa rosae*, *Kalmusia rosae*, *Leucaenicola rosae*, *Lophiostoma rosae*, *Lophiotrema rosae*, *L. rosicola*, *Magnitheca rosae*, *Muyocopron rosae*, *Neohysterium rosae*, *Neoloculosulcatispora rosae*, *Nigrograna rosae*, *N. triseptata*, *Paraconiothyrium guizhouense*, *P. rosicola*, *Parasulcatispora rosae*, *Parathyridaria rosicola*, *Peroneutypa rosae*, *Phaeoacremonium rosae*, *Pseudocoleophoma rosae*, *Pseudocoleophomopsis rosae*, *Pseudolentistoma rosae*, *Pseudoneodictyosporium rosae*, *Pseudopaucispora rosae*, *Pseudorobillarda rosae*,

Virosphaerella rosae, *Xylochrysis asexualis*, *X. camelliae-sinensis*, *X. rosae* and *X. sexualis*. In addition, 47 new host records and six new geographical records from China are reported, while five known species are treated as synonyms. All new taxa are confirmed and discussed based on detailed morphological descriptions, macro- and micro-illustrations, and phylogenetic trees.

Furthermore, by integrating the USDA Systematic Mycology and Microbiology Laboratory database, relevant literature, and my own data, I compiled the first global checklist of fungi associated with *R. roxburghii* and *R. sterilis*, providing a valuable reference for understanding fungal diversity on these hosts. This study significantly expands the taxonomic framework of several lineages within Dothideomycetes and Sordariomycetes and highlights the role of *R. roxburghii* and *R. sterilis* as reservoirs of fungal diversity. The findings establish a baseline for future research on saprobic fungi and Botryosphaeriales in taxonomy, phylogeny, and ecology, and emphasize their key functions in plant litter decomposition, nutrient cycling, and plant health.

In the study of Botryosphaeriales, I also achieved important advances. Through comprehensive analyses of morphological characteristics and multi-gene datasets, the phylogenetic relationships of several lineages were clarified, and seven new species together with 25 new host records were introduced. These results not only enrich the taxonomic framework of Botryosphaeriales but also provide new evidence for understanding their pathogenic, saprobic, and endophytic lifestyles in agricultural and natural ecosystems.

In addition, I established *Botryosphaeriales.org*, a digital platform dedicated to the taxonomy, phylogeny, and information sharing of this order, offering a dynamic, comprehensive, and authoritative resource for researchers worldwide. Overall, this study fills critical gaps in the knowledge of saprobic fungi and Botryosphaeriales associated with *R. roxburghii* and *R. sterilis*, and lays a solid foundation for further investigations into the phylogenetic relationships, ecological roles, and potential applications of plant-associated fungi.

Keywords: Asexual Morph, Checklist, Dothideomycetes, Saprobic Fungi, Sexual Morph, Sordariomycetes