Dissertation Title	Diversity of Fungi Associated with Grapevine, Cherry and Blueberry in China
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ABSTRACT

Cherry, grapevine, and blueberry are important fruit crops in China, valued for their high economic and nutritional significance. However, they are susceptible to various fungal diseases caused by multiple pathogens, which severely impact fruit production and quality, leading to significant economic losses. Although extensive research has been conducted on fungal pathogens causing these diseases, most studies have only focused on a single fungal taxon or one type of disease. Additionally, inconsistencies in identification methods and the lack of adherence to the latest fungal classification systems have led to confusing and potentially misleading results. The objectives of this study are to: (1) investigate the occurrence of important diseases affecting cherry, grapevine and blueberry across different cultivation regions in China and identify the associated fungi. This will help explore emerging and potential fungal pathogens, dominant disease-associated fungal communities, as well as the relationship between fungi, disease types and their distribution; (2) Compile fungal pathogen data by integrating results from this study with previous research, providing an updated and systematic summary that aligns with the latest fungal classification. Given their widespread occurrence and significant impact, cherry leaf spot (CLS) and grapevine trunk diseases (GTD) were selected to study their associated fungal communities; For blueberry, as emerging diseases and pathogens have been frequently reported in recent years, a comprehensive identification was conducted on fungi associated with important diseases, including fruit rot, leaf spot, stem blight and root rot. Fungal species were identified based on morphological characters and multi-locus phylogenetic analysis, and pathogenicity tests were performed on selected fungal isolates.

As a result, three *Colletotrichum* species from Beijing, seven *Fusarium* species from three provinces (including six new host records), six *Cladosporium* species from Beijing (including five new host records), as well as one *Neopestalotiopsis* and one *Diaporthe* species were identified from different symptom types of cherry leaf spot. The pathogenicity of *Colletotrichum* and *Fusarium* species was verified, and all fungal species reported as CLS pathogens were summarized. For grapevine trunk disease, forty species associated with Botryosphaeria dieback, black foot disease, and Diaporthe dieback were identified across eight provinces. These species belonged to twenty-one genera, including twelve new host records. The dominant genera included *Diaporthe*, Botryosphaeriaceae, *Cylindrocarpon*-like and *Fusarium*-like species, providing a comprehensive summary and supplementation to existing GTD studies. On blueberry, fruit rot, leaf spot, stem blight and root rot diseases were comprehensively investigated from five provinces, seven pathogens causing blueberry fruit rot were identified, and 103 species from forty fungal genera were recovered from the other three diseases. *Alternaria*, *Botryosphaeria*, *Fusarium*, *Neopestalotiopsis*, and *Pestalotiopsis* are the five most prevalent genera associated with leaf spot, stem blight and root rot, accounting for nearly 50% isolation ratio. The prevalence of the fungal genera in isolation sources and regions was preliminarily analysed. Species from the dominant genera *Neopestalotiopsis* and *Pestalotiopsis* were characterized and described, including seventeen new host records and three new species. Additionally, pathogenicity assays were conducted on seven species causing fruit rot and three species causing stem blight. Finally, a comprehensive summary of fungal pathogens associated with blueberry diseases in China was compiled. The current study is a continuation, expansion and conclusion of fungal species associated with cherry leaf spot diseases, grapevine trunk diseases and blueberry diseases in China, relevant results provide an insight into the overall occurrence of the diseases, as well as an important basis on the diagnosis and management of the diseases.

Keywords: China, Cherry Leaf Spot, Grapevine Trunk Disease, Blueberry, Pathogens, Phylogenetic Analysis, Morphological Characterization, Pathogenicity Test, Taxonomy