

3-009-3

Rice seed-borne fungi, with special reference to *Microdochium*, *Sarocladium* and dematiaceous hyphomycetes

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Purpose: Numerous fungi are carried by rice seed. In addition to the saprophytic species, some species can cause plant diseases, some can produce toxins and some are opportunistic to cause human diseases. Consequently understanding rice seed-borne fungi has been the concern of plant quarantine. The aim of this study is to establish a comprehensive guideline for the identification of rice seed-borne fungi with fully description, illustration, and molecular information. Taxonomic treatments are carried out where applicable.

Methods: A survey of fungi associated with rice seed was conducted during 2012 to 2019. All isolated strains were examined morphologically and subjected to multi-locus phylogenetic analyses.

Results and conclusions: More than four hundred fungal strains were obtained, from which 112 species have been identified. In *Sarocladium*, four species were successfully identified, including one new species. Particularly, a unique fluorescence-based method by utilizing invisible near-ultraviolet light was developed in the help of species separation. In *Microdochium*, three species were identified, including one new combination. For dematiaceous hyphomycetes, more than 15 species were identified. The placement of those species in allied genera was evaluated morphologically and molecularly. The abundance of fungi on rice seed is beyond expectation. There are more awaiting to be explored.