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Assessment of Endophytic Fungal Diversity and Beyond

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Endophytic fungi are microorganisms inhabiting living plant tissues without causing apparent harm to the host. They are drawing increasing attention due to their ability to produce various bioactive compounds as well as their effects on host growth and resistance to biotic and abiotic stresses. As a first step to assess biodiversity of plant associated fungi in Korea and the following evaluation on diverse biological activities, we are collecting endophytic fungi from plant in wild followed by systematic long-term storage in liquid nitrogen. Molecular identification using ITS sequences was also incorporated for pure culture by hyphal tip isolation. As of April 2015, about 1,400 fungal strains had been isolated from about 170 plant taxa. Fungal isolates belonging to Pleosporales, Diaporthales, Glomerellales, Hypocreales, and Xylariales were the most abundant. These collections are being used for several complementary researches, including screening of isolates with novel bioactive compounds or conferring drought stress resistance, phylogenetic and genomic study. Genome sequencing was performed for 3 isolates, one Xylaria sp. strain JS573 producing griseofulvin, an antifungal compound, and two Fusarium spp. strains JS626 and JS1030, which are assumed to be new species found in Korea. More detailed analysis on these genomes will be presented. These collections and genome informations will serve as invaluable resources for identifying novel bioactive materials in addition to expand our knowledge on fungal biodiversity.