

昭和基地に植栽され枯死したヤナギ実生から分離された微小菌類

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Microfungi associated with standing-dead willow seedlings planted in East Antarctica

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Ice-free regions of continental Antarctica, comprising only about 2% of the continent, are cold and arid, imposing strong selection pressures on plant establishment and soil development. Despite the harsh environment, previous studies reported the occurrence of free-living fungi in soils and in association with bryophytes in coastal outcrops of continental Antarctica. Recent studies have examined fungal populations in historic-introduced, exotic materials and found a significant overlap of fungi isolated from these materials and isolated from environmental samples in pristine locations and a significant effect of exotic substrates on indigenous soil fungi. The purpose of the present study is to examine the diversity of microfungi associated with standing-dead stems of seedlings of *Salix* spp. (willows) planted in Syowa station, East Antarctica. Samples were collected in Syowa station on East Ongul Island, Lützow-Holm Bay, East Antarctica. During JARE51 in 2009-2010, we found willow stems, planted during JARE8 and 9 (1967-69) and died within a few years, still standing dead on the ground (Hoshiai 1970). In February 2010, a total of 41 standing-dead stems (approximately 3 cm in height, 1-3 mm in basal diameter) were collected and taken back to the laboratory. Fungi were isolated from stems with surface disinfection method, DNA of fungal isolates was extracted from mycelia, and the rDNA ITS and 28S regions were amplified. The isolates were grouped into molecular operational taxonomic units (MOTUs) according to the similarity of base sequences at the 99% similarity criterion. Fungi were isolated from 32 (78%) out of the 41 stems tested for isolation. A total of 43 isolates were obtained, which were classified into 18 MOTUs (Fig. 1). Leotiomyces was the most frequent family, including 29 isolates of 10 MOTUs, followed by Dothidiomycetes (9 isolates, 4 MOTUs), Sordariomycetes (3 isolates, 2 MOTUs), and Eurotiomycetes (2 isolates, 2 MOTUs). The most frequent MOTUs were MOTU1 in Leotiomyces close relative to *Cadophora luteo-olivacea* (7 isolates), MOTU9 in Leotiomyces (7 isolates), and MOTU18 in Dothidiomycetes (5 isolates). Some microfungi associated with dead willow stems are considered as saprobic fungi. We noted that root-associated microfungi were isolated frequently from dead willow stems.

References

Hoshiai T., 1970. Ongul Island: willow. Polar News 10, 30-31. (in Japanese)

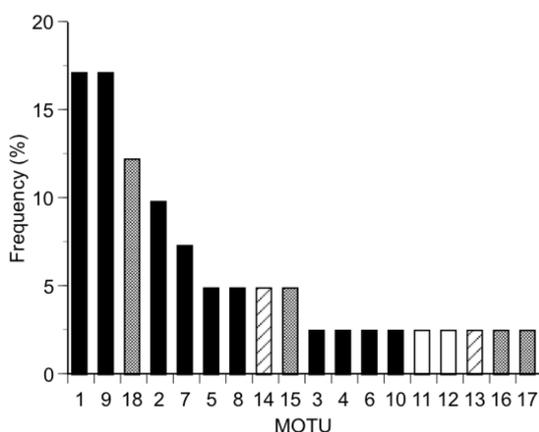


Fig. 1. Rank-abundance relationship of fungal molecular taxonomic units (MOTUs) isolated from standing-dead willow stems. Black bar, Leotiomyces; blank bar, Eurotiomycetes; shaded bar, Sordariomycetes; gray bar, Dothidiomycetes. The frequency of occurrence of MOTU was calculated as a percentage of the number of stems from which a MOTU was detected compared to the total number of stems tested (i.e. 41).