

東南極インホブデにおける菌類の多様性

辻 雅晴¹、辻本 恵¹、伊村 智^{1,2}

¹ 国立極地研究所

² 総研大・極域

First report of culturable fungal diversity in Inhovde area, East Antarctica

Masaharu Tsuji¹, Megumu Tsujimoto¹ and Satoshi Imura^{1,2}

¹ National Institute of Polar Research

² SOKENDAI (The Graduate University for Advanced studies)

Over 1000 fungal species have been isolated and recorded from Antarctica (Bridge and Spooner 2012). Seventeen ascomycetous and 14 basidiomycetous species were reported from near the Syowa station, East Antarctica. (Tsuji et al 2013). However, to our knowledge, the fungal diversity in the Inhovde area, East Antarctica has not been reported yet. In this study, we investigated the culturable fungal diversity in the area.

Each 0.1 g soil sample was placed on potato dextrose agar (PDA, Difco, Becton Dickinson Japan, Tokyo) containing 50 µg/mL chloramphenicol at 10 °C for a period of up to 3 weeks. Fungal samples were chosen for isolation based on colony morphology. Each colony of a different morphology was purified by repeated streaking on fresh PDA.

DNA was extracted from fungal colonies, using an ISOPLANT II kit (Wako Pure Chemical Industries, Osaka, Japan) according to the manufacturer's protocols. The extracted DNA was amplified by polymerase chain reaction (PCR), using KOD-plus DNA polymerase (Toyobo, Osaka, Japan). The amplified DNA was purified using Sephadryl S-400HR (Sigma-Aldrich Japan, Tokyo). Sequences were determined using an ABI prism 3130xl Sequencer (Applied Biosystems, Life Technologies Japan, Tokyo). The species were identified by BLAST analysis based on a sequence homology of > 99%.

A total of 116 culturable fungal strains were identified from terrestrial vegetation and pond sediment samples collected in Inhovde area. Based on ITS region and D1/D2 domain of 26S rDNA sequence similarity, these strains were classified to 10 species. Of these, 112 strains were classified as basidiomycetes that belonged to five genera and eight species (*Cystobasidium* sp., *Cryptococcus albidosimilis*, *Cryptococcus friedmannii*, *Cryptococcus victoriae*, *Glaciozyma watsonii*, *Leucosporidium scottii*, *Mrakia gelida*, *Mrakia robertii*); four strains were classified as ascomycetes that belonged to two genera and two species (*Collophora* sp. and *Lecythophora* sp.). All species investigated in this study exhibited good growth in the vitamin-free medium and could grow under subzero temperature conditions. In general, the continental Antarctic environments are considered to have oligotrophic conditions. From the results of the growth properties at subzero temperature and in vitamin-free media, they are considered to have obtained these growth abilities to survive in oligotrophic environments.

References

1. Bridge PD, Spooner BM, Non-lichenized Antarctic fungi: transient visitors or members of a cryptic ecosystem? *Fungal Ecology* 5: 381–394, 2012
2. Tsuji. M et al., Cold adaptation of fungi obtained from soil and lake sediment in the Skarvsnes ice - free area, East Antarctica, *FEMS Microbiology Letters*, 346, pp. 121-130, 2013.