Taxonomic and functional diversity of fungi associated with mosses and planktonic algae in continental Antarctica

Takumi Yoshida [1], Seri Matsuzuka [2], Yukiko Tanabe [3], Masaki Uchida [3], Sakae Kudoh [3] and Takashi Osono [1]
[1] *Faculty of Science and Engineering, Doshisha University*
[2] *Graduate School of Global Environmental Studies, Kyoto University*
[3] *National Institute of Polar Research*

The Antarctic Continent is almost covered with snow and ice and is harsh for living organisms because of the cold, arid, and nutrient-poor environment. However, there are regions called ice-free regions, which are not covered fully with snow and ice. In the ice-free regions around the Lützow-Holm Bay area (Queen Maud Land), there are more than 100 lakes and marshes. In the bottom of these lakes and marshes, biological communities develop consisting mainly of blue-green algae. Parts of algal communities come off from the bottom to become planktonic algae and are usually washed ashore. Moreover, mosses live around lakes and marshes in the ice-free regions. The purpose of the present study is to identify the species of fungi and to evaluate their bioactivity living in planktonic algae and moss in Antarctica. Samples were collected in Yukidori-ike, Oyako-ike, Arisa-ike and Ayame-ike in the ice-free regions in January 2010. At each location, three substrates, namely moss, planktonic algae in the water and planktonic algae at the water's edge, were collected. Five samples of each substrate were collected, reaching 60 samples overall. A total of 46 isolates of fungi were obtained from 41 of the 60 samples. These isolates were observed by stereoscopic microscope (magnification of 6.3) and optical microscope (magnification of 200) and classified into 8 morphotaxa, three of which were *Phoma herbarum*, yeast and *Arthrinium* state of *Apiospora montagnei*. It was not possible to identify the other 5 morphotaxa via morphological observation. *Phoma herbarum* was the most frequent species, accounting for 32 of the 46 isolates and was subdivided into 11 morphotypes according to colony characteristics. We will present the results of DNA barcoding and physiological profiling (Biolog) of 46 isolates. The responses of fungal isolates to incubation temperatures were also examined so as to conduct physiological profiling at their optimum growth temperatures.