

# 南極海跡湖ぬるめ池における原生生物マイクロプランクトンの群集構造解析

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## Community analysis of protistan microplankton of Antarctic marine relic lake Nurume-Ike

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Protists are essential to the function of most aquatic ecosystems and play pivotal roles as primary producers and consumers (Azam *et al.* 1983; Caron *et al.* 1999). It is important to clarify the diversity and community structure of protists to understand the aquatic ecosystem in an area of interest. In this study, we attempted to reveal the biodiversity and community structure of protistan microplankton in Antarctic lake Nurume-Ike. Nurume-Ike, located in Langhovde area, is a typical marine relic and meromictic lake (Sano *et al.*, 1977). The water column of this lake consists of three to four layers (Kudoh *et al.*, 2008) as follows. The surface layer (0-3 m) is slightly saline and is influenced by melt ice and water input from the surrounding catchment. The salinity of the second and third layers (3-11 m) is similar to that of the ocean. The bottom layer (>11 m) has one and a half times the salinity of the ocean, and has a completely reduced environment.

Sampling was conducted at Nurume-Ike (69° 13' 23" S, 39° 39' 43" E) on January 3, 2013 during the 54th Japanese Antarctic Research Expedition. The water temperature and pH were 9.3°C and 8.1, respectively. Ten liters of surface water was screened through a 100- $\mu$ m nylon mesh and poured into a container. The cells were collected on membrane filters (pore size 10  $\mu$ m), fixed with 5% Lugol's solution, and stored at 0-4°C until analysis. The fixed cells were recovered by centrifugation, and metagenomic DNA was extracted. The protistan 18S rRNA gene clone library was constructed using the metagenomic DNA. The clones were randomly chosen, sequenced, and identified by using BLAST (Altschul *et al.* 1990).

The protistan microplankton in Nurume-Ike was not too diverse compared to ordinarily aquatic environments in temperate regions. Total 146 clones were grouped into 11 phylotypes. Most dominant phylotype, NRM-009, showed 99% sequence similarity with nonmotile dinoflagellate *Spiniferodinium galeiforme* (Horiguchi and Chihara, 1987) originally isolated in subtropical island in Japan. This phylotype shared 67% of total clones. The second dominant phylotype, NRM-082, was related to Prasinophycean flagellate *Pyramimonas gelidicola* (McFadden *et al.*, 1982) originally isolated from sea ice in Prydz Bay, East Antarctica. The phylogenetic and taxonomic analyses of other phylotypes are now investigated. It will be also interesting to see the genetic differences between Nurume-Ike protistan species and their marine relatives as topics of evolutionary biology.

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