Diurnal oscillation of salinity could select diatom species as an ice algae in seasonal ice in Saroma Ko Lagoon

Yuki Hashimoto[1] and Yoshihiro Suzuki[1]

[1] *Course of Biological Sciences, Graduate School of Science, Kanagawa University*

Sea ice coverage of arctic region in summer has decreased and great part of the multi-year ice has been replaced by the seasonal ice. In these areas primary productions were supported by micro algae in / under the sea ice. Especially the algae in the bottom layer of the ice (ice algae) were often concentrated and colored the inhabiting ice brown. Most of the ice algal species were often thought to be common to the planktonic species, although the environment in the sea ice could be different from those in the sea water under the sea ice. In this study, we focus on the salinity environment under the seasonal ice in Saroma Ko Lagoon, and compared growth responses of ice algal species with those of planktonic algal species.

Conductivity was measured by the digital meter with water proof probes placed at 0 and 40cm below the under surface of sea ice. Estimated salinity oscillated diurnally, increased and decreased during day and night, respectively (Fig.1). Predominant species in ice algal and planktonic communities were isolated from bottom layer of sea ice and sea areas without sea ice, respectively. Ice algal strain showed higher rate than planktonic one at all the salinities of this experiment (13.5-50‰). Optimum salinity of both strains was 30.0‰. The rates of ice algal one were constant among this range, although those of planktonic one decreased at above and below the optimum salinity (Fig.2). Now we were analysing the growth responses of these algal species to the diurnal oscillation of salinity observed in Saroma Ko Lagoon..

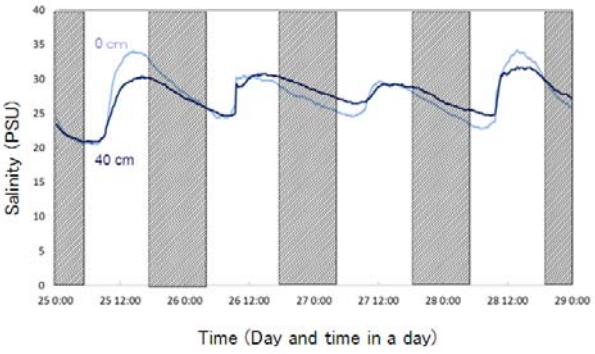

Fig. 1. Diurnal changes of salinity under sea ice. Conductivity was measured by the digital meter at 0 and 40cm below the under surface of sea ice on February, 2012.

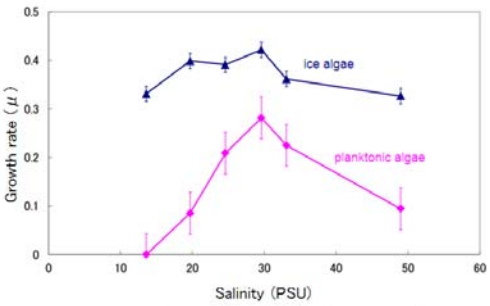

Fig. 2. Growth responses of two algal species to salinity. Strains were incubated in F/4 medium(34‰) under the continuous illumination with blue fluorescent light at ca. 25 μmol photons m^{-2} S^{-1} at 0 ºC. The salinity of the medium was changed gradually. Growth rates were estimated by the cell concentrations.