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MICROPLANKTON INVESTIGATIONS AT THE FAST ICE EDGE AND ON THE GUNNERUS BANK IN THE ANTARCTIC OCEAN MADE ON THE 25TH JARE CRUISE (ABSTRACT)

Akira TANIGUCHI[1], Keisuke IWANAMI[2], Satoru FUTATSUMACHI[2], Etuyuki HAMADA[3] and Yasuhiko NAITO[4]

[1]*Faculty of Agriculture, Tohoku University, 1-1, Tsutsumidôri-Amamiyamachi, Sendai 980*
[2]*Hydrographic Department, Maritime Safety Agency, 3-1, Tsukiji 5-chome, Chuo-ku, Tokyo 104*
[3]*Tokyo University of Fisheries, 5-7, Konan 4-chome, Minato-ku, Tokyo 108*
[4]*National Institute of Polar Research, 9-10, Kaga 1-chome, Itabashi-ku, Tokyo 173*

Distribution and abundance of microplankters in relation to hydrographic conditions in the offshore waters south of the Antarctic Divergence were investigated in two series. The first was of so-called ice edge studies, in which effects of sea ice on microplankton and hydrography as well were investigated. In the area around 64°S and 44°E, where the surface was covered with the fast ice in its southern extent, the water was weakly stratified vertically. The surface temperature was slightly higher in the north (>-1.0°C) than in the south (>-1.75°C) and increased with depth to 1.5°C at 200 m forming a thermocline between 75 and 200 m. Silicate, phosphate and nitrate were abundantly detected throughout the water column over the entire area. Their concentrations again increased with depth, while the north-south difference in the upper 75 m was small. On the other hand, ammonium and nitrite generally decreased with depth. This suggests that there had occurred active ammonium excretion and nitrate reduction. A single chlorophyll maximum layer was observed in the subsurface between 75 and 100 m over the area, excepting the southernmost station where the maximum value was observed at the surface or just beneath the fast ice. In general, the level of chlorophyll *a* (<0.16 $\mu g/l$) was unexpectedly low. The effect of sea ice on phytoplankton productivity in this area was likely to be less definite compared with that in the arctic Bering and Chukchi Seas located in the counterpart in the northern hemisphere.

In the second series of the investigations, effects of upwelling deep water on phytoplankton productivity in the eutrophic antarctic waters were studied on an east-west transverse section over the Gunnerus Bank (68°S, 33°E). The eastern half covered an upper course of the current flowing in the area. A slight upward motion of deep water was detected at the edge of the Bank (700 m depth). Temperature increased with depth and a thermocline was formed around 100–200 m in the east and 200–300 m above the Bank. On the other hand, two haloclines were formed at different depths, *i.e.*, around 30–50 and 100–200 m in the east and 50–75 and 200–300 m above the Bank. Since salinity and temperature increased in parallel with depth in the deeper discontinuity layer, pycnocline was not developed in this layer. Only a pycnocline was defined at the shallower halocline. Phosphate concentration increased below this pycnocline and silicate increased below the deeper halocline. Maximum values of chlorophyll *a* stocks (0.24–0.36 $\mu g/l$) were found around the shallower pycnocline.

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