

Nutrient status of snow cover and sea-ice in the southern Sea of Okhotsk

Daiki Nomura^{1,2}, Takenobu Toyota¹, Sumito Matoba¹, Jun Nishioka¹ and Kunio Shirasawa¹

¹ Institute of Low Temperature Science, Hokkaido University, Kita-ku, Sapporo 060-0819, Japan
E-mail: daiki@lowtem.hokudai.ac.jp

² Japan Society for the Promotion of Science Research Fellow PD

Samples of sea-ice and snow covered on sea-ice were collected with the icebreaker *P/V Soya* during early February of 2007 in the southern Sea of Okhotsk to evaluate the amount of nutrient in the sea-ice and snow. The concentration of nitrate+nitrite, phosphate and silicic acid in the sample was measured in conjunction with such physical parameters as temperature, salinity, oxygen isotopic ratio and ice texture. Sea-ice was categorized into three types as snow ice, granular ice and columnar ice, based on the oxygen isotopic ratio and ice texture. A higher nitrate+nitrite concentration up to $13.5 \mu\text{mol L}^{-1}$ was found in the snow and snow ice, implying the deposition from atmosphere as a snowfall. The snow and snow ice accounts for 23% of the total amount of nitrate+nitrite in sea-ice and snow. Phosphate and silicic acid concentrations were highest in granular ice up to $14.3 \mu\text{mol L}^{-1}$ and $32.7 \mu\text{mol L}^{-1}$, respectively. This probably results from the selective incorporation of phosphate and silicic acid from seawater to sea-ice. The granular ice accounts for 95% and 84% of the total amount of phosphate and silicic acid in sea-ice and snow, respectively.