

## Variability of sea ice fauna in the sea ice floes and water column in the Antarctic seasonal ice zone

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Sea ice contains various organisms such as bacteria, algae and proto- and metazoans (Horner, 1990). Two calanoid copepod species *Stephos longipes* and *Paralabidocera antarctica* and harpacticoid *Drescheriella glacialis* have been known as dominant metazoans in the sea ice (Tanimura et al., 1996; Swadling et al., 2000; Schnack-Schiel et al., 1998). These copepods, as well as other organisms and inorganic materials, in sea ice are potentially released into the water column during sea ice melting from spring to summer. Thereafter they possibly affect pelagic ecosystem as a component of the food web around the marginal ice zone. Most of ecological studies on sea ice biota have been based on the land-fast ice and multiyear ice, although seasonal sea ice zone covers huge areas in the Southern Ocean. This study clarified the characteristics of the community composition in drifting sea ice floes off Vincennes Bay, Indian sector, and compared assemblages of sea ice fauna in sea ice and water samples to discuss the influence of sea ice biota into the water column during sea ice melting. Samples were collected in the marginal ice zone off Vincennes Bay in January of 2014, 2016 and 2017 during the training vessel *Umitakamaru* cruises (Fig.1). Both water and sea ice samples were sieved by a hand net (20  $\mu\text{m}$  mesh) and then preserved by neutralized formalin sea water (final conc. 5%). *S. longipes* and harpacticoid nauplii were found at high abundance and large variability (2016:  $22079 \pm 34670$  inds. $\text{m}^{-3}$ , 2017:  $17899 \pm 53923$  inds. $\text{m}^{-3}$ ) in the sea ice samples of 2016 and 2017. In the water samples, lower abundances of *S. longipes* and harpacticoid nauplii were observed in 2016 (20 inds. $\text{m}^{-3}$ ) than those in 2017 (600 inds. $\text{m}^{-3}$ ). The difference in abundance was likely attributed to that in physical property (salinity and temperature). Abundances of *S. longipes* and harpacticoid nauplii were higher in lower salinity and temperature. This indicates that the abundance in water column temporarily increases where timing of sea ice melting is earlier. Their abundance in the water column was remarkably high in the surface layer (maximum value 810 inds. $\text{m}^{-3}$ ) but the abundance was one sixth of 0 m at 35 m depth, indicating that they were quickly removed in the surface layer. It has been reported that sea ice biota can be important food source for some animal groups such as zooplankton and fish larvae beneath winter sea ice (Schnack-Schiel, 2003). This study suggested that sea ice fauna released in summer is also served as food items.

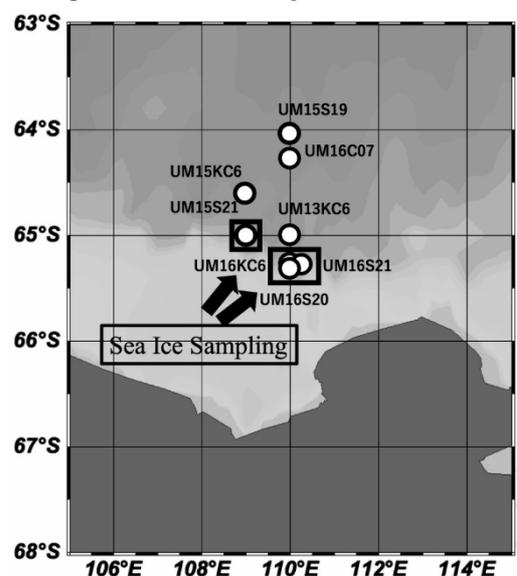


Figure 1. Location of the sampling site

(Circle: Water sampling, Square: Ice sampling)

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