

## Planktic foraminiferal distribution in the subarctic North Pacific and impact of seawater [CO<sub>3</sub><sup>2-</sup>] on shell calcification

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Planktic foraminifera are oceanic unicellular protozoa with calcareous shell. All extant species of planktic foraminifera are spending free-floating life from surface to intermediate water down to 1000 m. There are a variety of species relate to oceanic environment or water depth where they live (e.g. Hemleben et al., 1989). Therefore, planktic foraminiferal shell in marine sediments has been recognized as useful tool to reconstruct paleoenvironments.

The subarctic North Pacific Ocean locates on the termination of ocean general circulation, and high nutrient deep water from south upwelled to mid-depth. As a result of mixing in surface to mid-depth, the subarctic North Pacific has high nutrients concentration and known as a high biological productivity area (e.g. Takahashi et al., 2002). In the paleoceanographic study, therefore, this region has been considered as important area for biological pump and the global carbon cycle. In addition to contribution to paleoceanographic study, the subarctic North Pacific has been recognized as the area where seawater carbonate ion concentration ([CO<sub>3</sub><sup>2-</sup>]) might be significantly reduced by current ocean acidification over the twenty-first century (Orr et al., 2012). Reduction of seawater [CO<sub>3</sub><sup>2-</sup>] must have impact on calcifying organism such as planktic foraminifera, results in reduction of shell density. Therefore, identification of current planktic foraminiferal distribution and shell density in the subarctic North Pacific is crucial for estimation of impact on planktic foraminiferal ecology by ocean acidification in near future. However, foraminiferal distributions in the subarctic North Pacific Ocean are not well understood. Here we present horizontal and vertical distributions of planktic foraminifera collected by plankton net deployed at nine sites (target depths: 0-50, 50-100, 100-150, 150-200, 200-300, 300-500 m) in the whole subarctic North Pacific Ocean, in order to understand the relationship between foraminiferal assemblage and insitu seawater conditions. Furthermore, we observed internal structure of foraminiferal shell and measured shell density by Micro Focus X-ray CT scanner (MXCT), and compared these results with seawater [CO<sub>3</sub><sup>2-</sup>].

Keywords: Planktic foraminifera, the subarctic North Pacific, shell density, Ocean acidification