中層の海洋酸性化とそこに生息する浮遊性有孔虫の影響評価
Intermediate-water acidification and biologic responses of planktic foraminifera

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Anthropogenic CO_2 emission is making lower pH conditions in the ocean, thereby marine organisms will be affected severely to their ecology and physiology. Recent studies suggest that large changes of pH in intermediate water of the Atlantic Ocean and indicates ocean acidification enhances during past two decades. More recently, similar lowering pH in intermediate water had reported in the North Pacific, but such studies are very limited. To confirm the progress of intermediate water acidification, we started to investigate carbonate chemistry of intermediate water and its biological responses in the North Pacific. As a preliminary result in this study, we show the spatial distribution and morphological features of one planktic foraminiferal species *Globorotalia scitula* (Brady) which lives in the intermediate water on the monitoring line near Hokkaido Island (A-line) of Japan Fisheries Research and Education Agency (JFR). We performed the MOCNESS plankton towing on July 2016 and collected planktic foraminifers from each layer above 1,000 m water depth. *Globorotalia scitula* (Brady), the one of the deepest habitat species in planktic foraminifers is considered the environmental indicator of intermediate water, therefore we choose this species for evaluating biological responses. Vertical distributions of this species indicated remarkable bimodal distribution patterns in the water column. Maximum numbers of adult and juvenile specimens occurred at water density (sigma θ) = 26.9 (ca. 300 m) and 27.2 (ca. 500 m), respectively. In other words, juveniles lived in deeper water depth than adult ones. Such habitat depth is unique in the whole planktic foraminiferal life and indicates different habitat compared to other surface-dwelled planktic foraminifers.
We also performed the analysis of individual shell density of *G. scitula* by using Microfocus X-ray Computed Tomography (MXCT). Shell density variations of each specimens had wider ranges and those were equal to ca. 2.1 ~ 2.5 ug/um3. Shell density of *G. scitula* did not show remarkable differences with the water depth. It suggests that shell density of *G. scitula* did not change in the water column if the carbonate saturation (Omega_calcite) of ambient seawater was less than 1.0. In this presentation, we will show the pore density of *G. scitula* and discuss the relationships with carbonate chemistry.

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