

Oxygen isotope stratigraphy for the Japan Sea during the last 1 Myr using shallow marine sediment at IODP Site U1427

*Takuya Sagawa¹, Takuya Itaki², Yoshitaka Nagahashi³, Yasufumi Satoguchi⁴, Ken Ikehara², Tomohisa Irino⁵, Ryuji Tada⁶

1.Institute of Science and Engineering, Kanazawa University, 2.Geological Survey of Japan, AIST, 3.Faculty of Symbiotic System Science, Fukushima University, 4.Lake Biwa Museum, 5.Faculty of Environmental Earth Science, Hokkaido University, 6.Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo

The Japan Sea is sensitive to the glacial-interglacial sea level variation because of narrow and shallow straits, which connect with adjacent seas. The oxygen isotope change in the Japan Sea is, therefore, distinct from so-called "standard isotope curve." While previous studies have tried to construct unique isotope stratigraphy for the Japan Sea using deep sea sediments, it is problematic that foraminiferal fossil do not occur continuously in the deep sea sediment due to significant change in paleoceanographic environment. Moreover, determination of marine isotope stages using planktonic isotope is not straightforward because lighter peaks correspond to both glacial and interglacial maxima.

The 570 m long sediment core is drilled during IODP Expedition 346 from ~330 m seafloor (Site U1427) off Tottori Prefecture. The sediment at this site lacks dark-light alternation, which generally observed in sediment from deep sites, indicating that the deep sea anoxic events at glacial maxima did not affect the depth of U1427. Therefore, well preserved benthic foraminifera are continuously observed except for some intervals. Here we analyzed benthic foraminiferal isotope at 1 m intervals in order to construct isotope stratigraphy for 1 Myr. Fortunately, the bottom water at the depth of U1427 is affected by surface freshening event at glacial maxima but not affected by Tsushima Warm Current at interglacial maxima. Therefore, the lighter value of benthic oxygen isotope reflects the glacial freshening event. The interglacial maxima are recognized by occurrence of warm water species of Radiolarians. By combining with tephrochronology, we have constructed oxygen isotope stratigraphy for 1 Myr.

Benthic foraminifera as well as calcareous nannofossils and ostracods are absent at intervals of MIS12 and 16. Because diatom species that prefer low salinity water are observed in these intervals, surface water freshening at these glacials were more severe than other glacials for benthic foraminifera.

Keywords: Japan Sea, isotope stratigraphy, glacial-interglacial cycle, Integrated Ocean Drilling Program