Diatom asssemblage in the Okhotsk Sea surface sediments

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The Okhotsk Sea is covered by seasonal sea-ice in winter known as the southern limit of the sea-ice covered area in the northern Northern Hemisphere. When the sea-ice forms, brine water with high salinity is ejected. Because the density of the brine water is higher than the surrounding seawater, it sinks to the ocean interior and forms the Okhotsk Sea Intermediate Water (OSIW). The OSIW is the source water of the North Pacific Intermediate Water (NPIW). Diatom is a marine phytoplankton and the assemblage is sensitively responding to environmental change in euphotic zone. Their biogenic opal ($SiO_2 \cdot nH_2O$) frustules can be well-preserved in sediments. Therefore, fossil diatom assemblage in sediment is useful to reconstruct paleoenvironment change. In this study, diatom assemblages in 12 surface sediments from the Okhotsk Sea were investigated using field emission scanning electron microscope (FE-SEM). In each sample, around 100 valves are photographed and counted. *Chaetoceros* genus was separately counted without taking photo. Based on the microscopic observation, 33 diatom taxa including 15 genera 22 species were identified. Relative abundances of sea-ice related species and cold-water species were high in every sample. Geographically, relative abundances of sea-ice related species in the western Okhotsk Sea off Sakhalin Island were significantly higher than that in the eastern Okhotsk Sea off Kamchatka Peninsula. This is consistent with sea-ice coverage conditions which is much longer in the western Okhotsk Sea., In particular, in the Amur river estuary, relative abundances of sea-ice related species were greater than 40 %. *Fragilariopsis cylindrus* is the dominant ice algae in sea-ice of the Okhotsk Sea. % *F. cylindrus* in sediments was 9 % on averaged in the western Okhotsk Sea whereas 3% on averaged in the eastern Okhotsk Sea. There was a consistent relationship between sea-ice covered period and relative abundance of sea-ice species frequency. Relative abundance of *F. cylindrus* under FE-SEM in this study was 2-8 times higher than that under light microscope in previous study. Because *Fragilariopsis cylindrus* has small and thin valves, it might be a factor for the underestimate of this species by using light microscope.

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