現生・化石珪藻群集を用いた南極宗谷海岸の沿岸淡水湖における古環境復元

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Reconstruction of paleoenvironmental changes at coastal freshwater lakes along the Soya Kaigan(Coast), Antarctica, using modern and fossil diatom assemblages

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Antarctic coastal lakes are invaluable archives of paleoclimate and paleoenvironment changes due to the retreat of Antarctic Ice Sheet. In Soya Kaigan (Coast) of Lutzow-Holm Bay region, there are many coastal lakes in ice-free areas. Hydrological changes of coastal lakes located below 20 m ASL from marine to freshwater environments are result from the recession of glaciers and subsequent isostatic uplift (Verleyen E, Hodgson D A, Gibson J, et al., 2011; Verleyen E, Hodgson D A, Sabbe K, et al., 2011). This study discussed the environmental change of the coastal freshwater lakes, Lake Oyako-ike in Skarvsnes ice-free area and Lake Yukidori-ike in Langhovde ice-free area, along the Soya Coast of East Antarctica. For reconstruction of paleo-environment in both lakes, this study focuses on the results of the modern and fossil diatom asssemblages changes using surface/shoreline sediments and core sediments. We conducted Elemental Analyses, sedimentary facies, ^{14}C dating and microscopic observation of fossil diatoms for sediment core samples. Modern diatom assemblages were observed from surface/shoreline sediments.

Diatoms are one of the most common phytoplankton(Class: Bacilllariophyceae). Diatoms are used as powerful and reliable environmental indicators (Cholnoky, 1968; Lowe, 1974). This utility can be attributed to their high abundance and species dibersity, which are distributed among most aquatic environment. Additionally, their cell wall made of silica (hydrated silicon dioxide) called as frustule, so that their remains are highly durable and well preserved in accumulated sediments as fossils (Smol & Stoermer, 2010). In Antarctic and subantarctic areas, diatoms are present in nearly all moist, wet to semi-dry, and some frozen habitats. Diatoms in the freshwater and brackish habitats of inland waters of the Antarctic provide valuable records of their historic and modern environmental status. (Smol & Stoermer, 2010). In this study, Diatom analysis was conducted in order to understand past water quality such as salinity when they live on.

The Ok4C-01 core (length 135 cm) from Lake Oyako-ike was divided in 5 zones according to the diatom assemblage changes. In zone 1 (135~127 cm, ca. 2,170-2,050 cal yr BP), high percentage of *Paralia sulcata* implies a coastal environment. In zone 2 (127~90 cm, ca. 2,050-1,500 cal yr BP), mainly marine diatoms are observed, but an existence of euryhaline (from brackish to freshwater) species implies the possibility of freshwater inflows. In zone 3 (90~77 cm, ca. 1,500-1,300 cal yr BP), the increases of freshwater species and brackish species imply a lower salinity environment than a coastal environment. Zone 4 (77~60 cm, ca. 1,300-1,100 cal yr BP) is characterized by an increase of freshwater diatoms and a resting spores of diatom. It suggests that environmental change from marine to freshwater environment. In zone 5 (60 cm~Top, ca. 1,100-220 cal yr BP), dominantly freshwater diatoms are observed. It implies that the environment of Lake Oyako-ike is freshwater lake in this period.

In addition to these results, We will report about the assemblage changes of fossil diatoms in the sediment core of Lake Yukidori-ike and modern diatom assemblages in both lakes in detail.