

Reconstruction of paleoclimate around late MIS 5 based on biogenic silica contents of Takano Formation

Naoko Kakuta[1]; Fujio Kumon[2]

[1] Geosphere and Biosphere Sci., Shinshu Univ.; [2] Environmental Sci., Shinshu Univ.

The Takano Formation is an ancient lake sediment from 165 to 20 ka distributed in Takano Basin southern Nagano City. The all-core drilling was performed on June 2004, and sediment of 53.88m length was recovered. (recovery rate 99%) The TOC and TN contents were analyzed at 1cm-interval and their time sequential profile was constituted based on the ages and depths of marker tephtras. In the result, TOC profile shows not only long term fluctuations corresponded with Marine Isotope Stage 3 to 6, but also short term (a several hundreds to a few thousand year) fluctuations.

The purpose of this study is to reconstruct paleoclimate of the basis of biogenic silica contents of Takano Formation. For example, Kuwae et al. (2003) proposed a relationship between diatom contents and precipitation. Biogenic silica contents (BSi) in lake sediment was measured by wet-alkaline digestion techniques (Mortlock and Froelich, 1989)

In Takano Formation, BSi contents measurement was started from the DKP horizon at 3cm-interval. At present, 1087 to 1925cm were measured, and its horizon corresponds to MIS 5a to 4. BSi fluctuates from 3 to 30% and shows 10% in cold-climate period and 20% in warm-climate period. As compared to SPECMAP, BSi profile was similar to the oxygen isotope profile over the 25000 years with slight discordance. Therefore it is considered that BSi is useful as a proxy related with temperature or other climate parameters closely-associated to temperature.

To take account the possibility of silica solution from inorganic minerals, same procedure was conducted for plagioclase, quartz and sericite powders. The results show that minerals solve as much as 1% silica. As BSi contents of Takano Formation are high, and fluctuation ranges are much wide, it is possible to use BSi fluctuation as a proxy of paleoclimate .

On the other hand, to examine which weather factor reflect to BSi, measurement of BSi contents is now in progress for the cored sediments from Lake Kizaki. Diatom contents and BSi have a good correspondence. The relationship between BSi and weather factor may become clear soon.