

Reconstruction of paleoclimate from the Last Interglacial to the Last Glacial periods deduced from TOC content of Takano Formation

Takaharu Tawara[1]; Naoko Kakuta[2]; Yasuhiro Nozue[3]; Fujio Kumon[4]

[1] Geosphere and Biosphere Sci., Shinshu Univ.; [2] Environmental Sci., Shinshu Univ.; [3] Environmental System Sci., Shinshu Univ.; [4] Environmental Sci., Shinshu Univ.

High-resolution and continuous study of paleoclimate during the Last Interglacial Period is rare in Japan. A part of the period is warmer than the present days, and the study of paleoclimate during the period can bring about the key information to estimate how climate systems changes with global warming.

The Takano Formation is an ancient lake sediment from 15 to 3 ka distributed in Takano Basin southern Nagano City. The all-core drilling of Takano Formation was performed on June 2004, and almost continuous sediment of 53.88m length was recovered successfully. The cored sediment is mainly composed of homogenous silty clay intercalating many tephra layers, some of that are wide-spread marker tephra such as DKP, Tateyama-E, Aso-4, Kikai-Tozurahara(K-Tz), Aso-3, and Tateyama-D. The core is covering from Upper members to Lower members of Takano Formation. Average sedimentation rate of Takano Formation was estimated from the ages and depths of the marker tephra. The TOC and TN contents and C/N ratio were analyzed at 1cm-interval and their time-sequence profile was constituted based on average sedimentation rate. TOC content as a proxy of paleotemperature is concordant with the pollen compositions.

The TOC profile shows considerable fluctuations with some short (a several hundreds to a few thousands year) and long (a several thousands year) periodicities. The long periodicity corresponds with Marine Isotope Stages 3 to 6, and short periodicity is very similar to Dansgaard-Oeschger cycle in Greenland ice core. Interstadial stages 9 to 25 are also well identified. MIS 5e (the Eem stage) was also confirmed as a broad peak with a few fluctuations, showing cool period in the middle stage.

The ages of above-mentioned climate events found in the Takano Formation are slightly younger than the ages of those in the ice-cores and/or MIS. This discordance might be caused by the ambiguity of the marker tephra ages.