

Vegetation and climate history for the past 34,000 years based on the sediment core analysis from Lake Aoki, Nagano Pref

KUMON, Fujio^{1*}, KAWAI, Sayuri², INOUCHI, Yoshio³

¹Faculty of Science, Shinshu University, ²Institute of Mountain Science, Shinshu University, ³Faculty of Human Sciences, Waseda University

Lake Aoki is an oligotrophic lake located in the northwestern part of Nagano Prefecture. The lake is 1.8 km² large, and 58 m deep in maximum. The sediment core analyzed was taken at a site of 55 m depth near the central basin of the lake, and is as long as 28 m. It consists of silty clay with many thin lamina of sand. Maker tephra bed identified and ¹⁴C age measurement enable age estimation of the cored sediments as old as 34,000 years ago.

Pollen analysis and total organic carbon content (TOC) measurement were performed for the cored sediment in short intervals. On the basis of pollen composition, vegetation change for the past 34 ka as follows; dominance of arctic conifer trees associated with cool-temperate deciduous broad-leaved trees in 34 to 30 ka, predominance of arctic conifers in 30 - 15 ka suggesting the Last Glacial maximum, quick change from arctic forest to cool-temperate forest in 15 to 12 ka, and stable cool-temperate deciduous broad-leaved forest in 12 to 2 ka.

TOC, a paleoclimate proxy, which can show winter temperature via plankton productivity in lake, shows quasi-periodic fluctuation which means warmness concordant with pollen composition. But dilution by non-organic clastic sediment decreases TOC contents in a few horizons, implying increases of erosion of the neighbor mountains.

A sediment core of 28 m length recorded well climate condition and vegetation history around the Northern Japanese Alps since the Last Glacial maximum

Keywords: pollen analysis, Lake Aoki, total organic carbon, Last Glacial Maximum, Japanese Alps, Japanese central highland