

APE031-17

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Climate changes during the past 47 ka deduced from TOC and TN contents of the sediment core BIW07-6 in Lake Biwa

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The organic carbon (TOC) and the nitrogen (TN) were measured at 1 cm interval for a sediment core (BIW07-6) taken from a site of 55 m depth off Okinoshima in Lake Biwa. As several ¹⁴C dates have been already reported by Kitagawa et al.(2010), BIW07-06 core can provide reliable age model for detailed age determination, associated with marker tephra ages. The ¹⁴C dates are calibrated based on IntCal09. The bottom of the 18.42 m-long core is estimated as old as 47 ka, and data interval is 28 years on average.

For example, TOC amount show a little high values, 0.6 to 1.0 %, in 47 to 30 ka, and low values, 0.3 to 0.9 %, in 30 to 14 ka. There is distinct low during 30 to 28 ka. TOC increases quickly from 0.9 to 1.5 % between 14 ka and 10 ka. After 10 ka, TOC amount is high as 1.5 % on average, with a long periodic fluctuation. This pattern of TOC fluctuation is very similar to those of BIW95-4 (Yamada et al., 2004), BIW07-5 (Kuriyama, 2011) and BIW08-B cores. The temporal change of TOC amount of BIW07-6 core can represent biological productivity in the whole Lake Biwa. This TOC profile is concordant with vegetation change clarified by pollen analysis for BIW95-4 core (Hayashi et al., 2010). One case study shows that total organic carbon (TOC) content of lake sediment is controlled mainly by winter temperature via biological productivity of lake water (Kumon et al., 2005).

Temporal TOC profiles of lake sediments in Lake Biwa can be proxy records for past temperature, and the temperature changes shown by TOC peaks also can be correlated to short warm periods named Interstadial 1 to 12 in Greenland ice core records. TOC data from BIW07-6 core could be a standard to reconstruct paleoenvironments and paleoclimate in Lake Biwa for the past 47 ka.

Keywords: BIW07-6core, Lake Biwa, TOC