

Holocene paleomagnetic secular variation record from Lake Biwa (BIWA SV-3) updated with new AMS radiocarbon dates

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Ali et al. (1999) published a Holocene paleomagnetic secular variation record from Lake Biwa (BIWA SV-3). This record was obtained by stacking consistent paleomagnetic data from three piston cores recovered at BIW95 Site 3 near the location of previous deep drilling. The three cores were precisely correlated to each other using prominent peaks of magnetic susceptibility variations and two volcanic ash layers (Kawagodaira and Kikai-Akahoya). The age model for BIWA SV-3 was constructed based on published radiocarbon ages of the Kawagodaira (about 3000 14C year B.P.) and Kikai-Akahoya (6300 14C year B.P.), both converted to calendar years, 3150 and 7250 cal year B.P., respectively. Although simple interpolation of these datum levels provided a reasonable age model, additional chronological data have been awaited. Here we report new AMS radiocarbon dates from Core BIW95-6, one of the three cores utilized by Ali et al. (1999). Single pieces of terrestrial macrofossils such as leaves, small branches and insect wings were sampled from the core sediments. Nine radiocarbon dates ranging from 1540 to 8140 14C year B.P. were determined with typical uncertainty of 80 to 100 years (1 sigma). A timescale in calendar age for BIWA SV-3 was constructed based on interpolation of the middle points of the probability distribution in calibration ranges (Reimer et al., 2004). Our radiocarbon dates are consistent with the tephra ages and essentially supportive to the simple age model of Ali et al. (1999). However, the new timescale implies a higher sedimentation rate in the upper part (about 2.1 mm/ year for the last 2500 years) and a lower sedimentation rate between the Kawagodaira and Kikai-Akahoya ashes (about 0.9 mm/year). As a result, the topmost part of the core is dated at about 770 cal year B.P., while Ali et al. (1999) suggested that BIWA SV-3 covers the period up to 260 cal year B.P.