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Paleomagnetic secular variation record from the Holocene sediment of the Ichi-no-megata marr, Akira Prefecture

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The Ichi-no-megata is a maar lake located in the Oga Peninsula, Akira Prefecture, which has a maximum water depth about 45 m. In 2006, core samples of the sub-bottom sediments were obtained at three holes in the central part. The core sediments, mostly composed of laminated clay or silt intercalating sandy turbidite layers and tephra deposits, provided a composite sedimentary profile of about 37 m long. Results of tephra analysis and radiocarbon dating suggested that the interval above the volcanic products from the adjacent San-no-megata maar (23.7 to 32.3 m deep) covers a time period since about 25 ka with a nearly constant sedimentation rate about 0.71 m/ky.

Using pass-through methods, we measured magnetic susceptibility and natural remanent magnetization (NRM) of u-channel samples. The magnetic susceptibility data confirmed the hole-to-hole correlation based on lithologic observations. Stepwise AF demagnetization of the NRM showed that the remanence is essentially composed of a single stable component. Because the studied sequence comprises of core segments typically about 80 cm long, a continuous record of declination change was not obtained. Inclination data is characterized by an average value about 50 degree and amplitudes comparable with a paleomagnetic secular variation (PSV). In particular, the inclination variation above 9 m deep shows a good similarity with the Holocene PSV record reported from Lake Biwa. Occurrence of the Kikai-Akahoya tephra (7.3 ka) in both sequences support correlation of the two records, suggesting usefulness of PSV records in high-resolution stratigraphic correlation at a regional scale.

Keywords: paleomagnetic secular variation, annual verve, remanent magnetization, magnetic susceptibility