Reliability of paleomagnetic directions of the Ichi-no-megata Marr sediments as a secular variation record

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Sedimentary paleomagnetic data is crucial for modeling of paleomagnetic secular variation (PSV) in global scale. As currently available Holocene paleomagnetic database contains inconsistent PSV records even from close areas, it is necessary to further improve quality and distribution of the sedimentary paleomagentic records. Here, we report paleomagnetic directions of multiple cores from Ichi-no-megata Marr located in Oga peninsula, Akita Prefecture, and evaluate their validity as a Holecene PSV record.
In 2006 and 2013, two series of core samples (IMG06; 37 m long, IMG13; 118 m long) were recovered from multiple holes in central part of the lake. The core sediments were mostly composed of laminated clay or silt, partly intercalating sandy turbidite layers. We have made pass-through measurements of natural remanent magnetization (NRM) of u-channel samples from these cores. We also made discrete measurements of $7cm^3$ cubic samples from two piston cores (IMG13P-1; 5.9 m long, IMG13P-2; 6.2 m long) collected in 2013. A precise age model has been constructed for the IMG06 core by means of Bayesian modelling constrained by event free depth (Bronk Ramsey et al., 2012).We applied this age model for the other cores based on lithological correlations and matching of magnetic susceptibility data.
Although stepwise AF demagnetizations showed that the NRM is essentially composed of a single stable component, a turbidite layer of 20-30cm thick, dated at about 120 year BP provided inclination values inconsistent between the 3 cores. This is likely explained by deformation of the sandy sediments during the core recovery or sub-sampling. Excepting such intervals, the inclination and the relative declination showed consistent variations between multiple cores, which are also resemble the PSV record from Lake Biwa (Ali et al., 1999). It is thus suggested that the paleomagnetic data from Ichi no-megata Maar can be regarded as a reference PSV record for the global modeling.

Keywords: remanent magnetization, paleomagnetic secular variation, Ichi-no-megata Maar, Holocene

