

A paleomagnetic record across the Mammoth reversed subchron reconstructed from the upper Pliocene Anno Formation, Awa Group, central Japan

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The Awa Group, distributed in the central Boso Peninsula, central Japan, is a suit of marine succession for contiguous paleomagnetic studies, because of its strong magnetization and abundant marine microfossils used for age constraints. In this study, we obtained a successive paleomagnetic record across the Mammoth reversed subchron from the upper Pliocene Anno Formation, Awa Group.

Rock samples for paleomagnetic and foraminiferal oxygen isotopic analyses were collected from the Shikoma River, Terao and Nagasaki sections in Futtsu city, Chiba. Mini cores with 1-inch diameter and hand-picked specimens with about 300 g by dry-weight were collected at 80 horizons at every 0.5-1.0 m stratigraphic interval.

We performed progressive alternating field demagnetization (pAFD), progressive thermal demagnetization (pThD) and various rockmagnetic analyses to extract primary components from the specimens and verify the stability of the remanence. The results for rockmagnetic analyses exhibit the most specimens have pseudo-single domain magnetites as the magnetic carrier of natural remanent magnetizations. We carried out the reversal tests, one of the field tests, and the data from both demagnetization methods are passed. Therefore, we calculated the Virtual Geomagnetic Polarity (VGP) by using the ChRMs from pThD, which exhibit a better result in the reversal test than pAFD.

The VGP path during ca. 3.35–3.19 Ma, including the Mammoth reversed subchron, was reconstructed. The VGPs across the upper and lower Mammoth boundaries are through the northeastern Africa and the southern Pacific off Chile, respectively. These VGP paths across the upper and lower Mammoth boundaries are similar to those from a sedimentary section in Sicily (Linssen, 1991) and from the Wai'anae volcano in Oahu (Herrero-Bervera et al., 1999; Herrero-Bervera and Valet, 2005).

References

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