

Paleomagnetism and Neogene tectonic rotation of the upper Amatsu Formation, the Awa Group, distributed in the Boso Peninsula, central Japan

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The Awa group, consisting of a Neogene marine sedimentary sequence, is distributed in the Boso Peninsula, central Japan. The Awa Group is divided into four units: the Anno, Kiyosumi, Amatsu, and Kinone formations (in ascending order). Since the upper Awa Group is exposed very well in the middle part of the peninsula, many stratigraphic studies have been conducted in this region (e.g., Niitsuma, 1976; Kameo et al, 2002; Nakajima and Watanabe, 2005). Okada and Okamura (2005) constructed a paleomagnetic study for the group in the north from the Mineoka Mountain, reported that the average paleomagnetic declination from the upper Amatsu Formation is approximately 50°. The data showed that a clockwise rotation occurred at around 5 Ma in the Boso peninsula which was supposed to be due to the collision of the Tanzawa Massif to the Honshu Island. But there was a possibility that secondary components remained on those data. Therefore, it is necessary to re-examine paleomagnetic data from this area to extract primary components by means of refined demagnetization and measurement methods. Here, we report a reliable magnetostratigraphy and try to discuss about the tectonic rotation suggested by Okada and Okamura (2005).

Shimota et al. (2016) obtained paleomagnetic data from the entire Amatsu Formation exposed along the Shikoma River, which shows more tuffaceous lithofacies rather than other region, which might have stable magnetic signals. Demagnetization results were displayed on both of the Zijderveld and equal area projection diagrams. Characteristic remanent magnetization (ChRM) was determined by fitting the least squares line to the linear vector endpoint trajectory (Kirschvink 1980). For each site, a site-mean direction was calculated from the ChRM directions. The reversal test (McFadden and McElhinny., 1990) on those results passed as the class C, indicating that the polarities are reliable. Therefore, those site-mean directions were estimate as primary component, the overall mean direction ($D = 29.5^\circ$, $I = 53.0^\circ$, $\alpha 95 = 9.3^\circ$) is calculated. Comparing a declination of Okada and Okamura (2005), this declination was smaller by about 20°. As this cause, we presumed that the central part of the Boso Peninsula has complicated geologic structure due to the development of numerous folds, faults and flexures (Kodama et al., 1990). So, a difference block rotation possibly occurred at the each block.

To discuss the above, we present new paleomagnetic data from the upper Amatsu Formation exposed along the Aikawa River in Takeoka area, Futtsu city, Chiba Prefecture on the west side and the Kanayama River reservoirs along the Kamogawa river in the Kamogawa city, the same prefecture on the east side. Based on the key beds, we correlated the result of paleomagnetic direction in the same time slice at area by area.

[Reference]

Kirschvink, 1980, *Geophy. Journal of the Royal Astronomical Society*, 62, 699-718. Kodama et al., 1990, *Jour. Geol. Sci. Japan*, 34, 105-115. Kotake et al., 1995, *Jour. Geol. Sci. Japan*, 7, 515-535. McFadden and McElhinny, 1990, *Geophy. J. Int.*, 103, 725-729. Nakajima and Watanabe, 2005, *Geology of the Futtsu District, Quadrangle Series, 1:50,000*. Niitsuma, 1976, *Jour. Geol. Sci. Japan*, 82, 163-181. Okada and Okamura, 2005, *Abs. Geol. Soc. Japan, Meeting*, p. 214. Okada and Shimota, *Abs. Geol. Soc. Japan*,

Meeting, 123, p. 196.

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