Reexamining the Futatsuzuka lava flow at Fuji volcano, a paleomagnetic approach

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In order to understand eruption history of Fuji volcano, we are studying the eruption ages using paleomagnetic methods. Here we report the paleomagnetic results of Futatsuzuka lava flow and Innomarubi lava flow at southeastern foot of Fuji volcano. The eruption age of Futatsuzuka lava flow has been estimated to be around 70 BCE (Takada et al.,2016) from the ^{14}C dating of organic sediments below the Futatsuzuka scoria fall deposit (FTT) (Yamamoto et al., 2005). However, the tephrochronolgical correlation has a problem that the chemical composition of FTT (Kaneko et al.,2013) is different from the Futatsuzuka lava flow. The supposed Futatsuzuka pyroclastic cone, which shall be the crater of Futatsuzuka lava flow and FTT, is covered by the scoria fall deposits of CE1707 (Hoei) eruption, and the source of Futatsuzuka lava flow is invisible. The ^{14}C date of the Futatsuzuka lava flow was not obtained, so that we try to determine the eruption age using paleomagnetic method. Samples for paleomagnetic measurements were collected from 3 sites of the Futatsuzuka lava flow. They were oriented by a sun compass to eliminate local magnetic anomalies. At each site, we collected 8 to 12 samples using an engine powered core picker. Samples were measured using a spinner magnetometer with alternating field demagnetization (AFD). The mean directions of the Futatsuzuka lava flow show the direction of D=-17˚, I=54˚. Comparing this result with the PSV curve (JRFM2K.1), the lava flow is estimated to be erupted between CE 550 and 600. The Innomarubi lava flow, also distributed at the southeastern foot of Fuji volcano, is estimated to be around CE 560 in age from our ^{14}C dating. It is very similar the eruption age of the Futatsuzuka lava paleomagnetic date, thus we compare the paleomagnetic directions of Futatsuzuka lava flow and Innomarubi lava flow. Their paleomagnetic directions are found to be essentially identical, which indicate that the eruption ages are very similar. The similarity of the petrological features of those laves also supports the paleomagnetic conclusion. Therefore, the Futatsuzuka lava flow and Innomarubi lava flow are simultaneously eruption from the northwest-southeast fissure vent around CE 560.

Keywords: Fuji volcano, Eruption age, Paleomagnetic secular variation

