

Detection of the past volcanic activity using magnetostratigraphy of diatomite formation from Hiruzen-bara, Okayama Prefecture

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The Middle Pleistocene Hiruzen-bara Formation exposed in Hiruzen-bara Highland, Okayama Prefecture, includes lacustrine varved diatomite formation of about 60 m thickness. It is composed of alternation of about 2mm thick couples of light-colored and dark-colored laminae. Because light-colored lamina is made mostly of *Stephanodiscus* sp. breeding in winter season, and dark-colored lamina of *Cyclotella comta*, a single couplet of these laminae is suggested to represent an annual deposit. A fission track age was determined to be 0.52 ± 0.11 Ma for zircon from the pumice layer intercalated in the Hiruzen-bara Formation (Ishihara & Miyata, 1999). We collected the diatomite samples and investigated their magnetic property (susceptibility and remanent magnetization). Seven hundred ninety cubic samples of 8 cm³ volume were continuously collected from a outcrop about 16.7 m long, which corresponds to the duration of about 8,000 years considering the mean thickness (2mm) of the laminae. The lower part of 15 m thickness contains narrow (a few mm) to wide (several ten cm) clay layers with chocolate color, brightly white laminae of about 1 mm thickness and rust-colored bands. On the other hand, the upper part of 1.5 m thickness contains narrow (a few mm) to wide (several ten cm) clay, sand and/or gravel layers with gray color. A volcanic sand and gravel layer of 1.5 m thickness is laid over the sampled range. There are two positive correlation patterns between higher susceptibility values and higher remanent magnetization intensities. One pattern is recognized in the upper part of 1.5 m thickness and another is recognized in diatomite formation at the distance of 10 to 15 m from the top of sampled range. Acquisition curves of isothermal remanent magnetization and hysteresis loops measured suggest that the sort and size of magnetic minerals cannot be distinguished between the upper and the lower parts. Difference of correlation pattern is solely due to alignment degree of magnetic vectors of magnetic minerals. The correlation pattern of the upper part of 1.5 m thickness is identical with that of the volcanic sand and gravel layer. This means that the clay, sand and gravel layers (about ten countable layers) in the upper part are the tephra. As the sort and size of magnetic minerals of the lower part are similar to that of the upper part, the diatomite formation at the distance of 10 to 15 m from the top also contains tephra layers (about ten countable layers). The presence of tephra in the diatomite formation shown by magnetostratigraphy suggests the history of the past volcanic activities in the neighborhood.