

Environmental magnetism of brackish-water sediments on the Japan Sea coast

Akira Hayashida[1], Susumu Inoue[2], Megumi Kato[3], Hitoshi Fukusawa[4], Yoshinori Yasuda[5]

[1] SERI, Doshisha Univ., [2] Division of Science of Environment and Mathematical Modeling, Doshisha University, [3] Geography, Sci., Tokyo Metropolitan Univ., [4] Dept. of Geography, Tokyo Metropolitan Univ., [5] International Research Center for Japanese Studies

We made rock magnetic measurements of core sediments from two brackish-water lakes on the Japan Sea coast, Lake Togo-ike and Lake Suigetsu. Magnetic-concentration parameters show clear correlation with lithology of the sediments, while coercivity parameters significantly increase corresponding intercalations of thin mud layers. Our data indicate that magnetic characters of the brackish-water sediments reflect environmental changes such as sea-water invasion and flood events in the Holocene.

We made rock magnetic measurements of core sediments from two brackish-water lakes on the Japan Sea coast, Lake Togo-ike in Tottori Prefecture and Lake Suigetsu in Fukui Prefecture. The core samples from Togo-ike mostly consist of non-glacial varved sediments and massive clay and silt partly including volcanic ash layers. We measured low-field magnetic susceptibility, anhysteretic remanent magnetization (ARM) and isothermal remanent magnetization (IRM) of discrete samples at about 10 cm interval. These magnetic-concentration parameters show clear correlation with lithology of the sediments. In particular, sandy parts of the non-glacial varve are suggested to contain greater amount of coarse-grained magnetite. We found that several horizons within the non-glacial varve are characterized with significantly high values of coercivity parameters, corresponding intercalations of thin mud layers. Thermal demagnetization experiments of three component IRMs and measurements of hysteresis parameters indicate presence of hematite at these horizons. Factor analysis of the magnetic parameters combined with mineral magnetic data revealed a characteristic component contributed by the magnetic-concentration parameters and the feldspar content, which is interpreted as representing detrital input of volcanoclastic materials. We also made the same rock magnetic analysis of a piston-core sample from Lake Suigetsu in Fukui Prefecture and obtained similar results. Our data indicate that rock magnetic parameters of the brackish-water sediments reflect environmental changes such as sea-water invasion and flood events in the Holocene. It is suggested that coercivity parameters would be particularly useful for detecting detrital inputs and estimation of their origin.