

Rock magnetic study of the topmost sediments from Lake Biwa

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We are performing rock magnetic analyses on the topmost sediments in Lake Biwa cored at three sites, where shows differences in the amount of dissolved oxygen (DO) of the bottom water and its seasonal change. The aim of this study is to clarify magnetic properties of the sediments and reveal changes of the properties related to variation of the redox environment in the bottom water.

The three sites are as follows; off Ohmimaiko (Ie-1, 73 m depth) and Ohmi-imazu (N4, 91 m depth) in the northern lake, and a dragged area in the southern lake (Sd, 13 m depth). During the stratification period of the water, minimum values of DO are observed in Oct.-Nov. at Sites Ie-1 and N4. The minimum DO value is lower in Site N4 than Site Ie-1. At Site Sd, the disappearance of DO occurs in July-Aug.

We will present results from the Ie-1 cores mainly in this time. Sediment cores of 10 to 40 cm in length were collected using gravity corers in Apr, May, July, and Nov, 2008. We obtained discrete samples continuously using plastic cubes of 7-cc and 1-cc and plastic straws of ca. 5 mm in diameter. The samples were freeze-dried. Using the cube and powder samples, we measured low-field susceptibility and hysteresis parameters, and performed acquisition experiments of anhysteretic and isothermal remanent magnetizations.

Rock magnetic results indicate a principal magnetic mineral in the topmost sediments is magnetite. The increase of magnetite concentration and smaller contribution of super-paramagnetic grain are implied in the sediments below 5 cmblf when the complete anoxic condition occurs in the bottom water.