

Magnetic characterization of marine sediments across a probable Cretaceous–Paleogene boundary in the Nemuro Group

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Previous and ongoing studies have suggested that a Cretaceous–Paleogene (K–Pg) boundary is present in a muddy sequence of the Nemuro Group in the Shiranuka Hill area in eastern Hokkaido. An interdisciplinary approach, including detailed mapping, radiometric dating, geochemical analyses, and biostratigraphic and magnetostratigraphic investigations, is needed to locate a K–Pg horizon in the group. For this purpose, we have investigated stratigraphic variations in rock magnetic properties of marine sediments across the probable K–Pg boundary. Samples were collected along a tributary of the Kwaruppu River, where a muddy sequence of the upper Kwaruppu Formation is exposed, and the presence of the K–Pg boundary is suggested from a preliminary geochemical investigation. The S-ratio, which is a measure of the relative contribution of high- and low-coercivities to the saturation isothermal remanent magnetization (SIRM), and the ‘hard’ IRM (HIRM), which is a measure of the absolute contribution of high-coercivity minerals to the remanent magnetization, both imply a broadly coarsening-upward trend across the probable K–Pg boundary. On the other hand, the pattern of the stratigraphic variation in the low-field magnetic susceptibility (MS) appears to be different between the upper and lower parts across the probable K–Pg boundary; the MS data show a cyclic variation of 50–60-m wavelength below and a steady decrease above. This change's cause is unclear, but this change may be related to paleoenvironmental changes at the K–Pg boundary.

Keywords: Nemuro Group, Shiranuka Hill, K–Pg boundary, Rock magnetism, Magnetic susceptibility