

Chemostratigraphic correlation of deep-sea sediments in the western North Pacific Ocean and its implication for the origin of the extremely REY-rich mud

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A deep-sea sediment containing high concentrations of rare-earth elements and yttrium (REY), has been discovered from pelagic region of the Pacific Ocean (Kato et al., 2011). The REY-rich mud is expected to be a new resource for the critical elements. More recently, the “extremely REY-rich mud” (total REY > 5000 ppm) was discovered within the Japanese EEZ around Minamitorishima Island in the western North Pacific Ocean (Iijima et al., *in revision*). Since the discovery of the extremely REY-rich mud, seven research cruises have been conducted in the Minamitorishima EEZ over three years. Due to detailed investigation by subbottom profiling and piston core sampling, the surficial distribution of REY-rich mud within the Minamitorishima EEZ has been well understood. However, piston coring cannot obtain sediment samples from the deeper part of the sediment layer. This hampers detailed discussion of sediment stratigraphy in the Minamitorishima EEZ that is an important key to elucidate the genesis and distribution of the extremely REY-rich mud.

In order to overcome this problem, we focused on the Ocean Drilling Program (ODP) Hole 1149 located near the Izu-Bonin trench. The sediment layer of Hole 1149 was almost continuously cored from the seafloor surface to ~180 mbsf (Plank et al., 2000), so it is considered to be an ideal sediment core for stratigraphic correlation within the western North Pacific. By comparing the chemical compositions of sediments between ODP Hole 1149 and the Minamitorishima EEZ, the sediment stratigraphy including REY-rich mud in the western North Pacific Ocean has been well reconstructed. In addition, we found extremely REY-rich mud containing 7500 ppm of total REY from the hole. This is the first report of extremely REY-rich mud from outside the Minamitorishima EEZ.