

超海洋中央部起源の G-L 境界石灰岩に挟在されるクロムに富む層について A unique Cr-enriched bed across the Guadalupian-Lopingian boundary (Permian) in mid-Panthalassan paleo-atoll carbonates

石川 晃^{1*}; 磯崎 行雄¹; 小福田 大輔¹; 小豆川 勝見¹

ISHIKAWA, Akira^{1*}; ISOZAKI, Yukio¹; KOFUKUDA, Daisuke¹; SHOZUGAWA, Katsumi¹

¹ 東京大学大学院総合文化研究科

¹The University of Tokyo, Komaba

We examined in detail the chemical composition of a thin clayey bed (~1 cm) recognized at the Guadalupian-Lopingian boundary (G-LB) in the mid-oceanic paleo-atoll limestone in Japan (Kamura and Akasaka sections), to clarify whether or not the clayey bed is the product of a large-scale explosive volcanism that led to the end-Guadalupian mass extinction (Isozaki and Ota, 2001; Isozaki, 2007). Results of X-ray mapping and ICP-MS analyses revealed that the clay materials both in Kamura and Akasaka are roughly identical in compositions and are characterized by high-chromium contents (ca. 3000 ppm in anhydrous basis). This contradicts the previous notion that the bed represents rhyo-dacitic tuff brought by explosive eruption of acidic magma. Despite this, the widespread occurrence of Cr-enrichment at the G-LB horizon is inferred from the fact that the G-LB mudstones in continental shelf limestone in South China (Wangpo Bed at Chaotian and Shangsi sections) have geochemical affinity to the Cr-rich clayey bed at Kamura and Akasaka sections deposited in western Panthalassa. From these data, together with the normal platinum-group element signatures throughout the G-LB samples, we invoke a global fall-out of Cr-rich air-borne ash originated from mafic or ultramafic magma, most likely related to the mantle plume-derived large igneous provinces (LIPs). This might be possible at the initial phase of intrusion/eruption of basaltic to picritic magma that formed the Emeishan LIP in South China (~260 Ma) or other continental LIPs emplaced during the breakup of the supercontinent Pangea, if such high-temperature magmas were effectively carbonated and hydrated through the reaction with the thick sedimentary piles of limestones and shales.

キーワード: 地球化学, ICP-MS, 粘土層, ペルム紀中-後期, 大量絶滅, 峨眉山洪水玄武岩

Keywords: geochemistry, ICP-MS, clayey bed, Guadalupian-Lopingian boundary, mass extinction, Emeishan flood basalts