

Paleoweathering environments recorded in the Pliocene-Pleistocene Kobiwako Group, southwest Japan

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The Kobiwako Group, which is distributed around southern part of Lake Biwa and northern part of Mie prefecture, provides important paleoweathering records during Pliocene and Pleistocene periods. This research aims to clarify the relationship between paleoweathering and source rocks in the Kobiwako Group, using sedimentary facies analysis, major and trace elemental geochemistry. The Iga and Kitamata formations, in the lower part of the Kobiwako Group, are examined in this research.

The Iga formation, in northern part of Mie prefecture mainly consists of mudstone and claystone with thin sand layers, suggests the deposition in the floodplain and short-lived lake environments with meander river system. The Kitamata Formation is composed from sand and boulder bearing conglomerate beds, indicating the deposition in coarse grained braided river environment.

The chemical analysis of the mudstones in the Iga and Kitamata formations represents varied weathering intensity. The discrimination using REE composition, the sediments in the Iga Formation were supplied from wide variety of igneous rock types between differentiated to not-differentiated. The sediments derived from differentiated rock type display high weathering index showing the intense chemical weathering environments in hinterland. Meanwhile, the sediments supplied from not-differentiated rock type, prevailing in the Kitamata Formation and the upper part of the Iga Formation, indicate the derivation under weak chemical weathering environments.

The paleoweathering degree estimated with provenance analysis represents the reality of paleoweathering environments even in the sediments derived from mixed source rocks.

This study could be utilized as a basis for understanding of past change of geological environment, because weathering zone is located at the top of the environment.

This study was carried out under a contract with METI (Ministry of Economy, Trade and Industry) as part of its R&D supporting program for developing geological disposal technology.

Keywords: paleoweathering, hinterland, provenance