

Variation of source rock assemblage recorded in the Tokiguchi Porcelain Clay Formation

HATANO, Nozomi¹ ; YOSHIDA, Kohki^{2*} ; SASAO, Eiji³ ; ADACHI, Yoshiko⁴ ; IWANO, Hideki⁵ ; DANHARA, Toru⁵

¹Division of Science and Technology, Graduated School of Shinshu University, ²Department of Geology, Shinshu University, ³Japan Atomic Energy Agency, ⁴Faculty of Science, Niigata University, ⁵Kyoto Fission-Track Co.Ltd

The Miocene Tokiguchi Porcelain Clay Formation consists mainly of muddy sediments, which were deposited in the tectonic controlled small inland basin in the southern part of the Gifu Prefecture, central Japan (Nakayama and Todo Collaborative Research Group, 1989). The depositional age of the formation is designated to Middle Miocene (approximately 10 Ma) on the basis of the yielding of *Penus trifolia* (Miki, 1939) and radiometric ages of tuffaceous sediments (Yoshida et al., 1997).

The sedimentological studies after 1980's revealed the depositional environments and detail of the sedimentary basin (ex. Nakayama and Todo Collaborative Research Group, 1989). Recently, paleosol horizons are reported from this formation (Hatano and Yoshida, 2014).

This research focuses the U-Pb radiometric ages of detrital zircon grains in the sandy sediments in this formation in order to clarify the provenance variations by radiometric ages. Additionally bulk rock assemblage of the hinterland was estimated by the REE chemical composition of the muddy sediments to search the source rock assemblage. The detrital zircon grains were sampled from Hishiya and Nakayama Mines, which are separated into 1 km distance, in Tajimi and Toki Cities respectively. As a result, the zircon grains sampled from the Hishiya Mine mainly indicate 70- 80 Ma, accompanied with zircons showing 200, 1700, 1900 Ma, while the zircons from the Nakayama Mine concentrate mainly 12-15 Ma with small amount of zircons in 1700, 1800 and 2900 Ma. REE composition of the muddy sediments indicates various source rocks in the hinterland including basic, intermediate and felsic rocks.

The Late Cretaceous-Early Paleogene radiometric ages were reported from the basement igneous rocks, Inagawa Granite (56-86Ma; Shibata et al., 1962; Suzuki and Adachi, 1998), Toki Granite (68-72Ma; Shibata and Ishihara, 1979; Suzuki and Adachi, 1998), Nohi Rhyolite (58-85Ma; Yamada and Koido, 2005), distributed around the sedimentary basin of the Tokiguchi Porcelain Clay Formation. Also the detrital zircons yielding Early-Middle Miocene ages are reported from the Early-Middle Miocene Mizunami Group (Sasao et al., 2006, 2011). Thus, the zircon group showing 70-80 Ma is interpreted to be originate from basement rocks. The group with 11-15 Ma zircons was possibly derived the Mizunami Group sediments. The zircon grains with Archaean - Proterozoic ages imply the derivation from the Jurassic Mino Terrane.

Though the Tokiguchi Porcelain Clay Formation in above two mines were deposited in the same sedimentary basin, the age assemblage of detrital zircons shows significant difference which implies provenance variation. Also REE geochemistry is indicative of various source rock assemblage in the hinterland. These permit an inference that the change of river catchment area and interfingering deposition by the different river discharge made the difference of provenance records.

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