

Geotectonic identities of dismembered ancient fore-arc clastics: U-Pb dating of detrital zircons in Cretaceous-Paleogene shallow marine/fluvial sandstones sporadically found in Kanto, central Japan

*Ryo Hasegawa¹, Yukio Isozaki¹, Yukiyasu Tsutsumi²

1. Department of Earth Science and Astronomy, The University of Tokyo, 2. Department of Geology and Paleontology, National Museum of Nature and Science

For reconstructing the fore-arc basin of Cretaceous arc-trench system in Japan, provenance analysis for sandstones has been carried out by U-Pb dating of detrital zircons, particularly for the “Cretaceous-Paleogene” sandstone-bearing units sporadically occurred in 5 distinct areas in the Kanto Mountains and northern Kanto/southern Tohoku region, i.e. the Shoya Formation in Saku, the Kanohara conglomerate in Shimonita, the Yorii Formation in Yorii (Kanto Mountains), the Nakaminato Group (northern Kanto), and the Futaba Group (southern Tohoku), of which geotectonic identities are ambiguous. The U-Pb dating of detrital zircons from these units constrained the depositional ages of 10 sandstone samples to the Late Cretaceous and early Paleocene, and also their provenance. These results confirmed that 1) the Shoya Fm and the lower-middle Nakaminato Gr are of the Maastrichtian age, which are correlated with the Izumi Group on the Late Cretaceous Ryoke granitoids in SW Japan, 2) the Kanohara conglomerate, Yorii Fm, and Oarai Fm are of the Danian (early Paleogene) age, which were deposited on the Ryoke belt as well as the Izumi Gr., 3) the Futaba Gr is of the Coniasian age, which is correlated not with the Izumi Gr. but with the coeval units in western Kyushu, i.e., basal Himenoura Group, Kumamoto Gr, and upper Mifune Gr, which were deposited unconformably on a slightly older (Early Cretaceous) granitoids in the same fore-arc domain. These new age data provide new clues in reconstructing paleogeography of Cretaceous arc-trench system in Japan, before the Miocene opening of the Japan Sea. The expected discontinuity between pre-Miocene SW and NE Japan crusts in central Japan is currently buried beneath thick Quaternary sediments of the Kanto plain; nonetheless, the present data suggests two candidates, i.e., the seismologically detected major break of the pre-Cenozoic basement along the River Tone and the conventional Tanagura tectonic line to the north.

Keywords: fore-arc basin, detrital zircon, U-Pb age, Cretaceous, Paleocene, Kanto