

West end of fore-arc basin and provenance in Cretaceous SW Japan: Detrital zircon U-Pb age of Cretaceous-Paleogene sandstones in Western Kyushu

*Satoshi Yoshida¹, Yukio Isozaki¹, Yukiyasu Tsutsumi²

1. Graduate School of Arts and Sciences, The University of Tokyo, 2. Department of Geology and Paleontology, National Museum of Nature and Science

The shallow marine Upper Cretaceous strata in SW Japan (e.g., Izumi Group) represent fore-arc basin sediments of Cretaceous East Asia, which occur discontinuously for more than 1,300 km from Kyushu to the northern Kanto. From the previously called “Paleogene strata” in west Kyushu, sporadic occurrence of Late Cretaceous bivalve, ammonite, and dinosaur fossils were reported, and a new stratigraphical unit was named Mitsuzi Formation. However, the distribution, stratigraphy, chronology, and its geological relationship with the Eocene-Oligocene strata were not clearly documented. We determined U-Pb ages of detrital zircons from seven so-called Paleogene sandstones from the Nagasaki and Nishi-sonogi Peninsula. We confirmed the depositional age of the Campanian or younger for four sandstones (KYG8, ISA4, NSH1, and NSH2) and the Maastrichtian or younger for one sandstone (KYG10). Two sandstones (KYG1 and 3) are confirmed the Ypresian-Lutetian or younger in age. These ages are consistent with the previously reported fossil ages, except for the newly dated one sample from Fukabori. The age spectra of detrital zircons from the Campanian and Maastrichtian sandstones share the same pattern, which have an age peak around the Turonian. Judging from the dominance of Middle Cretaceous zircon grains, the main provenance of the Upper Cretaceous sandstones were probably the Ryoke/San-yo and San-in granite belts in SW Japan. The age spectra of detrital zircons in the Campanian-Maastrichtian sandstones are almost identical to the coeval unit in central Kyushu, Shikoku, and western Kii Peninsula. As all of these units were deposited unconformably over the Ryoke granitoids, over 1,300 km long arc-trench system from western Kyushu to northern Kanto, the Cretaceous sandstones in West Kyushu mark the known western end of the large-scale Upper Cretaceous fore-arc basin in Japan.

Keywords: detrital zircon, U-Pb age, Cretaceous, Paleogene, sandstone