

Secular change in provenance of Early Cretaceous Japan arc: detrital zircon geochronology of fore-arc sandstones

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The orogenic edifice of the Cretaceous Japan arc-trench system is relatively well preserved, particularly with the Ryoke granite belt (magmatic arc) and Sanbagawa blueschist belt (deeper Wadati-Benioff zone). For reconstructing the distributary pattern of terrigenous clastics within the ancient arc-trench system, U-Pb dating of detrital zircon is effective; e.g., the differentiation of fore-arc, intra-arc, and back-arc basins was demonstrated clearly (Nakahata et al., 2015, 2016a, 2016b). This study further investigated detrital zircon chronology of the latest Jurassic-Early Cretaceous sandstones in SW Japan, for constraining the onset of sedimentation in major arc-related basins and their differentiation. The result shows that late Paleozoic to mid-Mesozoic granitoids, particularly early Jurassic one, exposed in the Late Jurassic to Early Cretaceous Japan arc to feed fore-arc basins, although these older granitoids are extremely rare in Japan at present and that continent-derived or recycled Proterozoic clastics, mostly from North and South China blocks, were supplied steadily to the fore-arc domain until the Hauterivian (E. Cretaceous), but were almost totally shut down after the Barremian. This likely reflected the emergence of a major topographic relief within the arc that behaved as a significant barrier to prohibit continental sediment flux to the fore-arc domain. The intensified arc magmatism during the Cretaceous likely emplaced a large volume of new arc-granitoids to form a batholith belt in deeper crust and to uplift older crustal rocks on the surface.

Keywords: Cretaceous, arc-trench system, detrital zircon, U-Pb age, SW Japan, provenance