Clastic rocks in Triassic chert and disconformity in Triassic limestone found in Jurassic accretionary complex of Southwest Japan

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During the late Paleozoic to early Mesozoic time, the Pangea continent and the Panthalassa ocean occupied the whole area of the Earth. In order to clarify the paleogeography and paleoenvironment of the ocean, we must examine the accreted oceanic materials in the circum-Pacific orogenic belts. In this presentation we discuss the relationship and age correlation between the clastic rocks embedded in the Triassic chert of the Mino terrane and the disconformity found in the Triassic pelagic limestone of the Chichibu terrane.

Some of the Triassic chert in the Mino terrane, Southwest Japan, are interbedded with the clastic rocks (Kojima et al., 1999). Several clastic formations 2-7 cm in thickness are observed in the middle Ladinian to early Carnian chert in the eastern part of Gifu City. The clasts are 2 mm-2 cm in diameter; sedimentary structures like graded bedding are observed in the clastic formations. In the Hisuikyo area along the Hida River, sandy laminae in the 14 chert beds are observed within the totally 10 m-thick chert sequence. The clasts in both areas are composed of chert, siliceous shale, volcanic rocks, volcanic glass, quartz, apatite, dolomite, and fossil fragments of radiolarians and conodonts; ages of the fossils range from Permian to Triassic. Although similar clastic rocks were found from the Triassic chert in the Jurassic accretionary complex of Far East Russia (Kojima et al., 1997), we could not find them from the exceptionally well-exposed Triassic chert in the Unuma area along the Kiso River.

Present day analogue of the clastic rocks in Triassic chert was found around the Hawaii Islands. The Hawaii Islands are the largest volcanic edifice on the Earth, and are surrounded by the huge amounts of submarine landslide and debris flow deposits. Turbidite sandstone beds accompanied by the landslide phenomena were found to be embedded within the pelagic sediments about 300 km apart from the islands (Garcia and Hull, 1994; Naka et al., 2000). The sand clasts consist mainly of volcanic glass and radiolarian remains ranging in age from Eocene to Quaternary. On the basis of similarities of clastic composition, fossil age and occurrence, the clastic rocks of the Mino terrane and Far East Russia are also considered to be transported from the sea mounts in the Panthalassa ocean by turbidity current associated with landslides.

The Triassic pelagic limestone in the Taho and Kamura areas, Chichibu terrane, have several disconformity horizons during the Anisian to Carnian. Limestone breccias just above the disconformities have conodont assemblages with wide range of age before the unconformities (Koike, 1979). Now we consider that the disconformities represent solution of limestone forming the cap of sea mounts by the sea level drops. Similar phenomena were reported by Schlanger and Premoli Silva (1986) from the atoll of Line and Marshall Islands in the mid-Pacific.

Above-mentioned rocks in the Jurassic accretionary complexes in Japan provide important evidence to clarify the sea-level change and paleogeography of the Triassic Panthalassa ocean. The depositional site of the Triassic chert was the equatorial regions on the basis of the paleomagnetic data (Ando et al., 2001). We are planing to study similar rocks in more detail in future.