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Emplacement process of oceanic seamount origin limestone in the Northern Chichibu Belt

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Limestone blocks in the accretionary complex can be regarded as accreted fragments of seamount capping atoll carbonate in origin. To discuss emplacement process of such limestone blocks into the accretionary complex is significant for understanding subduction zone tectonics, but it has not been fully discussed except for some works. This study examines Kano-yama limestone in the Jurassic accretionary complex, the Kanto Mountains, central Japan and documents imbricate structure developed in the gigantic limestone block.

Kano-yama limestone and other adjacent limestone blocks such as Tatoro-yama, Futago-yama, and Hakuseki-san are embedded in the strongly sheared zone along the boundary of the Northern Chichibu Belt and the Sanchu “Graben” . This sheared zone comprises two formations: the Sumaizuku in the north and Hebiki formations in the south. The Sumaizuku Formation contains mainly chert and greenstone blocks whereas Hebiki Formation contains mainly sandstone blocks. Matsuoka et al. (1998) estimated accretion ages of the two formations to be Early to Middle Jurassic. Kano-yama limestone is accompanied by greenstones and volcanoclastic rocks. They are hyaloclastite and pillow lava, and according to chemical composition and petrology, they are N-MORB type basalt, except for one E-MORB. Thus, these greenstones are interpreted to have co-occurred tectonically with limestone, and almost all parts of volcanic body of a seamount seems to have subducted deeper.

Kano-yama limestone trends from WNW to ESE and is a limestone block 1 km $\times$ 200 m in size. The SW dipping bedding planes are observed in Kano-yama limestone, and on the basis of geopetal fabrics in boundstones, they represent normal sequence. Depositional facies of Kano-yama limestone are interpreted to be sand shoal and lagoon environment. Late Carboniferous to middle Permian fusulinacean genera are identified in Kano-yama limestone. Based on the fusulinacean age and lithology, Kano-yama limestone is divided into at least three units: Units 1, 2, and 3 in the seemingly descending order. Unit 1 contains components of sand shoal facies, and on the other hand, Units 2 and 3 contain both back reef and lagoon facies components. Fusulinacean age is younging upward within a single unit, but the older limestone overlies the younger limestone in a fault contact. They show totally imbricate structure. Limestone breccia is generally absent in Kano-yama limestone.

A lack of limestone breccia suggests that Kano-yama limestone is not an aggregate of redeposited collisional collapse products of oceanic reef complex at trench. Compared with sandbox experiment by Dominguez et al. (2000), a formative process of imbricate structure in the capping carbonate is rather explained by off-scrape of superficial part of a seamount. In conclusion, Kano-yama limestone was probably formed by off-scraping of back reef to lagoon deposits of cap carbonate, forming imbricate structure.

Keywords: seamount accretion, the Northern Chichibu belt, the Kanto Mountains, limestone, greenstone