

Controlling factor on evolution of late Pleistocene to Holocene sequences in Nara Basin

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Many researches on late Pleistocene to Holocene sequences (Chuseki-so) have been carried out in coastal lowlands. In contrast, stratigraphy and evolution of alluvial plain located above the coastal lowlands is less well known. We focus on Nara Basin to clarify stratigraphy and evolution of alluvial plain.

Two borehole cores (MK1, MK2) were taken at Matsukasa, Yamatokoriyama city located in the middle part of the basin. Sedimentary facies analysis and AMS radiocarbon dating were performed. Stratigraphy of late Pleistocene and Holocene deposits was built by analyzing existing borehole columns and radiocarbon ages. Additionally, an incised valley formed beneath the Kawachi Plain located near the Old Yamato river mouth during the sea-level lowstand was reconstructed by analyzing existing borehole logs. Sediment accumulation rate of the basin mainly during the last two millennia was estimated from depth of remains shown in archaeological reports published by Archaeological Institute of Kashihara, Nara prefecture.

Radiocarbon ages obtained from the cores suggest that thickness of Holocene deposits is less than approximately 3 m and they have mainly accumulated after 2,000 cal BP. The timing is not related to sea-level change of Osaka Bay. Sea-level change would affect change of river-bed gradient at Kawachi Plain near the river mouth. However, Kamenose narrow segment in Ikoma Mountain is located between Kawachi Plain and Nara Basin and is composed of Cretaceous and Neogene igneous rock. Rock hardness may have resulted in small incision rate of the river bed at the segment, and influence of the sea-level change above the segment was little.

Geological section of Nara Basin shows thickness of Holocene deposits on south area is larger than that of north area. Discharge and drainage area of south district are ca. 2.3 times larger than those of north district. This may be related to the difference in thickness of Holocene deposits.

Depth of remains during the era of Yayoi to Kamakura suggests that increase in sedimentation rate occurred after Asuka era. Existing pollen analysis results indicate that second growth forest probably influenced by human activity had already occurred in and around the basin at Kofun era. Therefore, it is possible that artificial effects in the basin caused increase in sediment production and influenced formation of late Pleistocene to Holocene sequences in Nara Basin.

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