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京都盆地 KD-1/KD-2 ボーリングコアの海成粘土層の再検討
Reconsideration of the existence of marine clay beds in KD-1 and KD-2 drilling cores in Kyoto Basin

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Research programs including seismic reflection surveys and deep drillings were carried out at the Kyoto Basin between 1998 and 2002 for clarifying underground structure of the basin. Deep drilling cores taken at three sites, KD-0 in the southern part of the basin (Ogura-ike), KD-1 in the central part (Hokotate Park south of JR Kyoto station) and KD-2 in the northern part (Nijo-jo Castle), were composed of thick strata of the Osaka Group and Pleistocene terrace deposits. Marine clay beds, the key beds in the Osaka Group, were identified at five horizons in KD-0 and KD-1 cores (Ma3, Ma4, Ma5, Ma6 and Ma9 beds) and three in KD-1 core (Ma5, Ma6 and Ma9 beds) according to the color of sediments, results of fossil and pollen analyses and stratigraphic correlations of volcanic ash layers (Kyoto City, 2003). Kitani and Kamo (2010) reconsidered the stratigraphy of KD-0 core, and identified 13 marine clay beds in the Osaka Group (Ma0, Ma0.5, Ma1, Ma1.3, Ma2, Ma3, Ma4, Ma5, Ma6, Ma7, Ma8, Ma9 and Ma10 beds) and one marine clay bed in terrace deposits (Ma12 bed).

In order to reconsider the existence of marine clay beds in KD-1 and KD-2 cores, we performed measurements of electric conductivity (EC) and pH of stirred clayey sediments in water on 15 mud layers in KD-1 core and 14 layers in KD-2 core based on the method of Yokoyama and Sato (1987). In KD-1 core, samples of marine clay beds identified in Kyoto City (2003) showed high EC and low pH values, and were regarded as marine sediments based on the criteria of Yokoyama and Sato (1987). A mud layer above Ma9 bed was also found to show high EC and low pH values, and marine diatom fossils were found in the mud sample by smear slide observations. The layer may be correlated to Ma10 bed. In KD-2 core, samples of Ma5 and Ma6 beds had high EC and low pH values. Other samples including that of Ma9 bed had low EC and higher pH of 6-7, and were regarded as fresh water sediments. It may be implied that the sea water invasion occurred at the formation age of Ma10 bed (about 0.34Ma) in the central part of the Kyoto Basin, and that the northern part has been under the fresh water environment after the formation age of Ma6 bed (about 0.62Ma).

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