Reconstruction of Paleogeography from the Boring Core Analysis during the Middle Pleistocene in the central part of Kanto Plain

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In the Kanto Plain, Oiso Hills and Boso Peninsula are standard areas of the Middle Pleistocene stratigraphy. In contrast, the stratigraphy in the interior of the Kanto plain is known very little mainly because it is buried below the Holocene. The authors analyzed two cores named as GS-FK-1 (Fukiage Core; 173.20m) and SA-GD-1 (Gyouda Core; 240.00m) drilled in the north-western part of the Kanto Plain in order to construct standard stratification during the Middle Pleistocene based on glacio-eustatic changes.

GS-FK-1 can be divided into 5 units of U1~U5 with the base of gravel layers as the sequence boundary formed during the low-stand in sea levels. Repetition of gravel layers (G1~G4) and fine-grained layers (S1~S5), including the marine deposit of S4 and S5, correspond with the regression-transgression cycles during the Marine Isotope Stage (MIS) 1~11 (Matsushima et al., 2004, Mizuno et al., 2005). SA-GD-1 can be correlated well with GS-FK-1 based on cyclical changes of the lithofacies.

The authors tried to correlate many geologic columns with GS-FK-1 to examine the distribution of marine and fluvial deposits using GIS. Marine deposits of MIS9 (S4) and MIS11 (S5) are traceable over the large areas of the central part of the Kanto plain. Lithologic composition of the fluvial deposits (G1~G4) was reflected by the geology in the Ara River basin and the Tone River basin. The fluvial deposits show that coarser gravels were transported by Ara River. The thickest fluvial gravel layer (G3) sandwiched between MIS6 gravel layer and MIS9 marine sediments is probably composed of alluvial fan gravels of MIS8~MIS7 and basal gravels of MIS8.

The paleogeography in the Middle Pleistocene is summarized as follows; in MIS9 and MIS11, sea-level reached at least the two boring sites. Transgression in MIS11 should be larger than in MIS9 because the S5 unit deposited in MIS11 is much thicker and finer than S4 unit in MIS9. In contrast S3, S2, S1 units correlated with MIS7, 5, 1 respectively are non-marine indicating that transgression in MIS11 was the largest during the last 400ka. These are consistent with the global eustacy characterized by the marine isotope changes. The thickest gravel layer (G3) suggests that the alluvial fan produced by the Ara River was larger in MIS8~MIS7 than present.