

Continuous analysis of pit-filling deposits in Kaman-Kalehöyük archaeological site using ITRAX: Toward high-resolution reconstruction of the history of human activity and technological evolution

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Midden deposits that fill the pits in archaeological sites have been studied as a medium that records human activity of the past. However, most of the studies focus on artifacts and remains found from the midden deposits, and not so much attention was paid to the sediment itself. Estimation of their ages are either based on stratigraphy of cultured layers and building layers that bear the pits, and detailed stratigraphy of the midden deposits is rarely examined.

In Kaman-Kalehöyük archaeological site in Central Anatolia, average duration of the cultured layers and building layers is approximately 1000 years and a few hundred years, respectively. Pits in Kaman are circular in shape with ca. 1 m in diameter and several tens of cm to 1 m in depth with flat bottom. They were originally used as grain storage and later became dumpsites.

As a feasibility study, we examined on approximately 2m-thick stratigraphic interval between two fire event layers of Bronze age exposed in the lowest part of the trench wall. The stratigraphy of pit-filling midden deposits within this interval is established by Tada T. et al. (this session). The result revealed that the total thickness of the pit-filled midden deposits reaches to ca. 8.5m that is more than four times thicker compared to the thickness of the stratigraphic interval between the two fire event layers.

Consequently, if we can continuously recover the midden sediment sequence and analyze the sequence continuously with high-resolution, it will become possible to trace the history of human activity, metal processing and pottery producing technologies with high-time resolution.

Based on this idea, we logged the midden sequence and took columnar samples of 5x5x50cm in size. We selected one of those columnar samples and analyzed its chemical composition semi-quantitatively with 1mm resolution using XRF core scanner (ITRAX) at Geological Survey in Turkey (MTA) in Ankara. We compare the ITRAX chemical composition analyses result with the high-resolution photograph of the sample to chemically characterize each lithology. We also subsampled the column sample with every 2.5cm-thick interval, and selected several of them to conducted WD-XRF and XRD analyses at MTA to compare with ITRAX analysis result.

We will present the result of our preliminary analyses of a selected column sample of the midden sequence in Kaman-Kalehöyük and discuss what kind of information on human activity and technology we can extract from the pit-filling midden sequence in Kaman-Kalehöyük.

Keywords: midden, human activity, technological evolution, Kaman-Kalehöyük, ITRAX, high-resolution reconstruction