

KEEPING ORGANIC COMPOUNDS IN ANCIENT POTTERY: A PRELIMINARY INVESTIGATION ON THE EFFECT OF CLAY MATRIX

Jan-Michael C. Cayme¹, Peeter Somelar², Rasmus Palm¹, Ester Oras^{1,3}, Signe Vahur¹, Ivo Leito¹

¹*Institute of Chemistry, University of Tartu, Ravila 14a, 50411 Tartu, Estonia*

²*Department of Geology, University of Tartu, Ravila 14a, 50411 Tartu, Estonia*

³*Department of Archaeology, University of Tartu, Jakobi 2, 51014 Tartu, Estonia*

e-mail of presenting author: jan-michael.cayme@ut.ee

Extraction of lipids from archaeological pot-sherds is a widespread technique [1,2]. The identity of these residues can be correlated to the possible consumption of certain food types, which provides information about the eating patterns and utilization of food in ancient communities. The role of clay - its physical and chemical properties - in the retention of organic residues are not fully understood. This research is a preliminary attempt to describe these processes by investigating the composition of model clay samples patterned after Estonian archaeological pottery types. The current focus is set on the impact of porosity of different ceramic mixtures on the preservation of lipids.

A mixture of red clay obtained from SE-Estonia and sand with different proportions of 15%, 20%, 25%, 50%, and 100% clay were made. Two batches of samples were prepared and fired separately in a furnace at 600°C and 800°C. X-ray diffraction (XRD) results show that the red clay is a type of mica/ illite/ illite-smectite mineral. The sand is mainly composed of quartz, potassium feldspar, and plagioclase. Hematite is also present in both clay samples.

Since the ceramic's porosity is speculated to have a significant role in the absorption of organic residues [3], a nitrogen (N₂) porosimeter was utilized to evaluate the pore width of the samples. Results show an increase in the material's porosity as the amount of clay increases and the pore width are within 2.0 to 3.0 nm. The preliminary correlations between ceramic clay content type and related porosity with lipid absorption will also be presented.

References

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