

## Results of preliminary petrographic studies of Langobard age ceramics from Balatonlelle and Szólád (Hungary)

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During our work we carried out petrographic studies on ceramics of two archaeological sites, the settlement from Balatonlelle, Felső Gamász and the cemetery from Szólád from the Langobard age near the southern part of Lake Balaton.

The Langobard people were staying in Pannonia province around 526-568. In Balatonlelle mostly hand-built household ceramics, swab pots (Kumpf) and wheel-thrown, late antique featured vessels were excavated, and occasionally some biconic cup-vessels (Schalengefäß) and a pear-shaped vessel were found as well. In Szólád biconic cup-vessels and swab cups were also dominant, besides only a Thuringian cup and a wheel-thrown jar with a pouring lip were found.

Generally coarse-grained rock fragments and their mineral constituents are present as non-plastic components in the ceramics of Balatonlelle. Among them basalt and sandstone can be found near the sites, unlike marble and andesite fragments. The fine-grained ceramics without any non-plastic components are rare. Dominantly carbonate and quartz were the non-plastic components of the ceramics from Szólád, but there were some ceramics with sandstone and marble fragments. The jar from Szólád does not contain any non-plastic components either. The cathodoluminescence microscopy studies showed different luminescence colours for the marble fragments of Balatonlelle and Szólád samples. Moreover further study is needed to decide whether the samples from Balatonlelle contain different types of marble fragments.

## Mineralogical composition of ceramics from Garvao iron age votive deposit (Portugal)

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In 1982, a votive deposit was discovered in Garvão (SW Portugal) revealing an important Iron Age II holy site. The pottery recovered shows that during Iron Age this archeological site was a merging geostrategic point of the Iberian societies with strong influences of the Mediterranean world and the Iberia celtic influences.

Raw materials used by these communities provide essential information to understand specific historical periods, particularly concerning the relationship of the societies with surrounding environment, eventual existence of trade routes and available technology. The geological resources are particularly useful for this purpose because even processed they can figure out identifiable signatures of provenance or technology used. Moreover, their intermittent occurrence and human necessity justify the existence of trade routes.

Special emphasis will be given to the provenance of the pottery, the technological aspects and the relationship between populations and Garvão holy site. The study of geological raw materials applying and combining modern techniques of earth materials sciences and the principles of physical sciences ( e.g. geology and chemistry) can provide answers and a better understanding of the Garvão importance in this area of the Iberian Peninsula. A multi-analytical methodology was setup using optical and electron microscopy, infrared spectroscopy and X-ray diffraction.