

Late Roman cooking ware from submarine excavation at the island of Pantelleria: comparative evaluation of the efficiency of traditional methods of salt extraction.

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This paper deals with the comparative evaluation of different procedures of salts extraction designed for archaeological ceramics from submarine burial environments. The experimental work was carried out on late Roman cooking ware finds found in a shipwreck near to the shore-line of the Island of Pantelleria (Sicily).

The studied ceramic artefacts were first well studied in terms of bulk characteristics (mineralogy, petrography and chemistry). Pore-size distribution was also determined in the same fragments afterwards subjected to specific salt extraction routines. SEM-EDS observation allowed to confirm the presence of soluble salts crystals in the pore spaces and to evaluate the mineralogical changes due to the prolonged contact with seawater under oxidizing and/or reducing conditions.

After a careful assessment of the conservation state of the analysed ceramic objects, that allowed to identify the main degradation patterns, three salt extraction methods were tested. The efficiency of deionised water immersion under stationary (which is by far the most used procedure by archaeologists and/or restorers) or mechanical stirring conditions were carried out. Both the above methods of extraction are based on diffusion processes. Salt removal by means of multiple packages of sepiolite poultice was otherwise applied. In the latter case salts extraction is based on diffusive and advective mechanisms.

The obtained experimental data allowed us to identify strengths and weaknesses of the tested extraction methods in terms of efficiency, kinetics, compatibility with the ceramic substrate, costs and easiness of application. The knowledge of all these parameters is truly important for restores and archaeologists in order to determine the most suitable treatment. Considering all the above mentioned criteria, salts extraction under mechanical stirring resulted to be the most effective between the compared methods. It is thus expected to be purposely suitable for laboratory fieldwork during submarine archaeological research and for the preliminary treatments preceding the museum exhibition of the most precious findings.