

Preliminary analyses on the characterisation of pigments from cosmetic shells from SE Arabia

Chiara Andrea Lombardi, Valeria Comite, Michele Degli Esposti, Andrea Zerboni, Paola Fermo

Malacofauna, both marine and terrestrial, found in archaeological and geological excavations is considered a cultural heritage to be preserved and studied. Such findings can often be analysed in different fields, such as geology and chemistry. In these cases, the fruitful collaboration of different areas of research also provides useful information for historians and archaeologists.

The present study is focusing on the marine shells found in burial contexts and containing greenish or blackish pigments and interpreted as eye make-up, which are quite common findings from pre-Islamic archaeological contexts (mostly dating to the Iron Age, ca. 300-400 BC) from Southeast Arabia.

The set of samples consists of 37 shells, both bivalves and gastropods, the latter being much less abundant; some of them contains abundant pigments, others show only a thin patina of pigment on the surface. The pigments observed have a predominantly green colouration, other shells, although fewer in number, show a black-brown colouration.

The aim of the investigation is to study pigments found inside shells to characterize their mineralogical composition and to identify the occurrence of organic binders.

The samples are investigated using micro-invasive techniques to find out the nature of the pigments. In particular, SEM-EDX analyses have been performed on micro-samples taken from the shells with the highest pigment content (9 specimen) to observe the morphology of shells' infilling and inform on their elemental composition. ATR/FTIR analysis carried out on the same micro-samples will inform on the molecular composition of pigments, thus detecting the possible presence of organic material subsequently analysed by GC-MS.

The project will also apply other techniques such as the use of XRD will allow information on the crystalline phases contained in the samples to be obtained.

It will also be interesting to apply LIBS analysis to obtain not only elementary pigment information but also stratigraphic information to make an in-depth study. In particular, the LIBS technique, which does not require sampling, will be applied on those samples (which are the most numerous, i.e. 28) that only have pellicular remains of pigments.