



A study of materials used in the production of wall mosaics from early Christian Cypriot basilicas (preliminary results)



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Introduction

A number of monuments in Cyprus are well known for their magnificent floor mosaics. Indeed Paphos is listed among the UNESCO World Heritage Sites primarily because of its mosaics. Wall mosaics are fewer to have survived and are often less impressive because most of them are only fragmentary. Therefore, wall mosaics in Cyprus have received far less attention than floor mosaics, in spite of their rarity and fragility.

A multidisciplinary research on the materials used in the production of mosaics for the early Christian Cypriot basilicas is under way at the University of Cyprus, as part of the NARNIA* project. The poster will present the first results of this study. The preparatory layers as well as the materials used in the production of tesserae will be described and characterized by means of a range of physical and chemical methods.

*New Archaeological Research Network for Integrating Approaches to ancient material studies

Samples

Samples studied come from different sites in Cyprus, and range from late Roman (4th c AD) to early Byzantine (7th c AD) to give an overview of the technologies used.

The samples discussed in this poster come from two sites:

- Kourion sea-side basilica (5th c -early 7th c AD)¹: fragments of mortar (with and without tesserae) + loose tesserae.



photo: PhryniHadjichristophi

- Polis Chrysochous (late 5th c AD)²: loose tesserae

Methods

- **mortar**: SEM-EDS (for elemental composition) and XRD (for mineralogical composition) were used.
- **glass**: SEM-EDS (for elemental composition), spectrophotometry (for color analysis) and Raman spectroscopy (for identification of colorants and opacifiers).

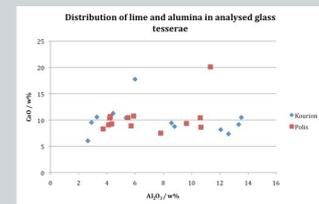
Mortar



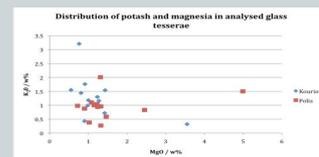
Mineral	Average content (from 16 samples)
Calcite	98.00 ± 0.98 %
Quartz	0.825 ± 0.52 %
Hematite	0.114 ± 0.039 %
Dolomite	1.48 ± 0.31 %

Almost pure calcite: lime mortar with quartz as aggregates and some hematite.

Glass tesserae: glass source



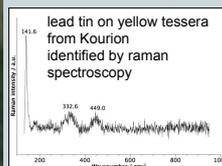
Mostly "natron based" soda-lime silica glass, but also some "mixed source" glass.



The high variety of Alumina concentration and could indicate the use of glass tesserae from different technologies³.

Glass tesserae: colorants and opacifiers

For both sites, opacifiers detected seem to be lead tin, which is compatible with the period of interest (late 5th c – early 7th c AD).



Colorants identified are:

Green colours: Cu & PbSn

Blue colours: Cu & Fe as colouring agents, + probably Co (below detection limits) in some cases

Red: Cu⁺ or Cu nano-clusters are responsible for the colour⁴

Yellow: Lead tin⁵

Prospects:

Other sites will be studied: Amathous, Kalavassos, Yeroskipou.

Glass tesserae analyses will be complemented with ICP (for more precise elemental composition). Portable XRF and Raman will be used to compare with what can be achieved with non destructive, portable techniques. Results with the spectrophotometer will be compared with the elemental analysis to try to develop it as a non invasive portable technique.

Mortar analyses will be complemented with XRF (for more precise elemental composition) and Hg porosimetry analysis.

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