9th European Meeting on Ancient Ceramics

- VESSELS: INSIDE AND OUTSIDE –
EMAC'07

24 - 27 October 2007, Hungarian National Museum, Budapest, Hungary

ROMAN THIN-WALLED WARE FROM ERCOLANO : AN ARCHAEOMETRICAL INVESTIGATION

Annarosa Mangone [a], Lorena Carla Giannossa [a]*, Rocco Laviano [b], Luigia Sabbatini [a], Angela Traini [a]

[a] Department of Chemistry, University of Bari, via Orabona 4, 70126 Bari, Italy; [b] Department of Geomineralogy, University of Bari, via Orabona 4, 70126 Bari, Italy

*giannossa@chimica.uniba.it

INTRODUCTION

Samples of Roman thin-walled ware from Ercolano, classified by the archaeologists as campanian production, were studied by Optical Microscopy (OM) and Scanning Electron Microscopy (SEM) with Energy Dispersive Spectrometry (EDS) with the aim of validating , on the basis of unambiguous elements, the archaeological hypothesis of local production. Thin-walled ceramic forms a widespread class in Roman Mediterranean area between 2th cent. BC and 3th AD. Traditionally, production centres are hypothesized on the basis of quantity and homogeneity of recovered material in the different archaeological sites, or on the comparison with other objects of certain provenance. The production indicators are few and, up to now, this class of Roman fine table ware has only occasionally been evaluated archaeometrically. In the Vesuvian area a production centre of these ceramics has been supposed on the basis of macroscopic observations and morphologic peculiarities of the pastes [1-3] .

Fragments are characterized (Figg. 1-3) by:
- fine texture paste;
- large degree of sintering;
- presence of pyroxenes, feldspars, volcanic rocks and opaque minerals - mainly made up by Mg, Si and Fe- as tempering materials.

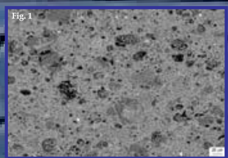


Fig. 1 SEM-BSE photomicrograph of the thin section of sample 1728, highlighting the large degree of sintering in the ceramic body.

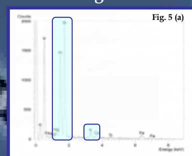
Figg. 2, 3 Polars optical microscopy of the thin section of sample 1728 (Fig. 2) and SEM-BSE photomicrograph of the thin section of sample 2892 (Fig. 3) showing the different minerals presnt in the body: 1- piroxenes, 2- fragments of volcanic rocks, 3- opaque minerals.

On most samples an engobe layer was applied.

It is characterised by:
- 100-200 μm in thickness (Fig. 4);
- different chemistry with respect to the ceramic body (Figg. 5, 6).

Fig. 4 SEM-BSE photomicrograph of the thin section of sample 1727. The engobe (upper) and the ceramic body (lower) are visible.

ED spectra suggest the employment of the same clay used for the ceramic body but refined -slightly higher Al/Si and K/Ca values in engobe with respect to the ceramic body-. Parallel fractures in the engobe and perpendicular in the ceramic body with respect to the surface suggest an application of the engobe on vessels after drying.



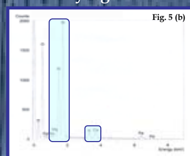


Fig. 5 ED spectra of sample 1727: the engobe (a) and the ceramic body (b).

As concern coloured surfaces, red in some samples, black in others, the analysis have shown two different productive technologies:

an evident morphological and compositional continuity between the coloured (red or black) surface and the bulk was found (Fig. 6).
ED spectra (Fig. 7) have revealed minor compositional differences -slightly higher Al/Si value, lower quantity of Ca and slightly higher of K and Fe in surface with respect to ceramic body- that allow to exclude an intentional addition of pigments: Fe as impurity was responsible.

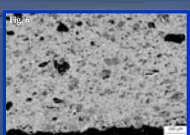


Fig. 6 SEM-BSE photomicrograph of the thin section of sample 1728.

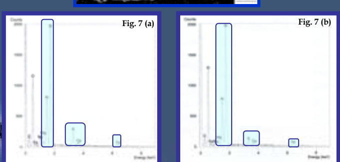


Fig. 7 ED spectra of the sample 1728: surface (a) and ceramic body (b).

a very sinterized layer (Fig. 8) on the ceramic body was revealed. It is characterised by:
- average thickness of about 20 μm;
- very compact structure with no voids and large degree of sintering.

ED spectra (Fig. 9) have revealed larger quantities of Al, Fe, K and lower quantities of Si and Ca in surface with respect to ceramic body. This indicate that a finer clay was used in the production of black and red layers than that utilized for the ceramic body [4].

Some samples red on the internal surface and black on the external one have shown the presence of a slip different in thickness. Since minor thickness is connected with red colour , it is reasonable to suppose that slip does not keep oxygen-resistant below a defined thickness.

Fig. 8 SEM-BSE photomicrograph of the thin section of sample 2964. In (a): ceramic clay (lower) and black layer (upper). In (b): ceramic clay (upper) and red layer (lower).

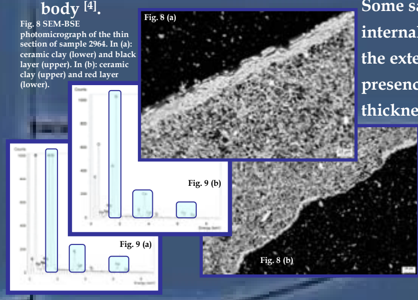


Fig. 9 ED spectra of the sample 2964: surface (a) and ceramic body (b).

The results indicate the existence of two different production technologies with regard to the Roman thin-walled ware from Ercolano and request a more careful study of archaeological data that classify this production as homogeneus. The presence of volcanic minerals comparable with eruptive products from Vesuvio-Monte Somma complex prove a local production for this typology [5].

REFERENCES

1. Gervasini L., "La ceramica a pareti sottili"; *La ceramica e i materiali di età romana. Classi, produzioni, commerci e consumi,* (2005)
2. Carandini A., "La ceramica a pareti sottili"; *L'instrumentum domesticum di Ercolano e Pompei nella prima età imperiale,* (1977)
3. Montagna G. et al., "The petrography and chemistry of thin walled ware from Hellenistic-Roman site at segesta"; *Arhaeometry* 45, (2003)
4. Maggetti M. et al., "Campanian pottery: the nature of the black coating"; *Archaeometry* 23, (1981)
5. Giannossa L. et al., "Ceramiche a pareti sottili dell'area vesuviana: indagine archeometrica Domus Herculenensis Rationes I, Dal museo allo scavo, Vesuviana, Antequem, (in press)