

Raman characterization of clay masks at Archaeological Museum of Lipari

V. MOLLIKA NARDO ^(A), D. GIUFFRIDA ^(A), V. RENDA ^(A) M. A. MASTELLONI ^(B) & R. C. PONTERIO ^(A)

^{A)} IPCF – CNR Messina Viale F. Stagno d'Alcontres, 98158

^{B)} Former Director of Polo, Parco Archeologico Lipari L. Barbabò Brea

The Archaeological Museum of Lipari "L. Bernabò Brea" is located on the rocks of the "Castle" of Lipari, an imposing dome of volcanic formation with characteristics of natural fortress. The museum of Lipari preserves a large collection of masks and statuette of the Greek world that allows visitors to learn about the civilization theater from the era of the great tragic Aeschylus, Sophocles, Euripides and Aristophanes to Menander. ^[1] The numerous statuettes and masks referable to theatrical genres (tragedy, satirical drama, comedy) in use at the time mostly come from the funerary equipment of the tombs of the "contrada Diana" and from votive pits or from dumps located in the area of the necropolis. These are miniature reproductions of the masks that the actors wore on their faces during acting to interpret the different roles assigned to them, including female ones. The poster deals with the study of pigments on some clay masks by Raman spectroscopy. The analysis of pigments on artworks is of major significance in art conservation as it leads to detailed characterisation of materials. To this purpose we used Raman spectroscopy, a non-destructive technique capable of analyze dyes and pigments in the cultural heritage field. The technique is able to investigate materials used on works of art because it is very reliable, sensitive, specific, non-destructive and can be applied *in situ*, therefore avoiding any sampling and consequently any damage to the object under examination.

The clay masks and statuette have been analysed by portable Bruker – BRAVO Handheld Raman Spectrometer (Fig. 2) equipped with licensed DuoLaser system and an algorithm able to mitigate the fluorescence, providing reliable and quality spectra on both inorganic and organic substances. (SSETM, Sequentially Shifted Excitation). The Raman spectra are acquired in 300-3000 cm⁻¹ spectral range and processed with OPUS software; identification of the collected signals is made by comparison with a spectral database ^[2] of reference materials.



Fig. 2 Bruker Bravo – Handheld Raman Spectrometer



Fig. 3 C) Statuette N° 3033

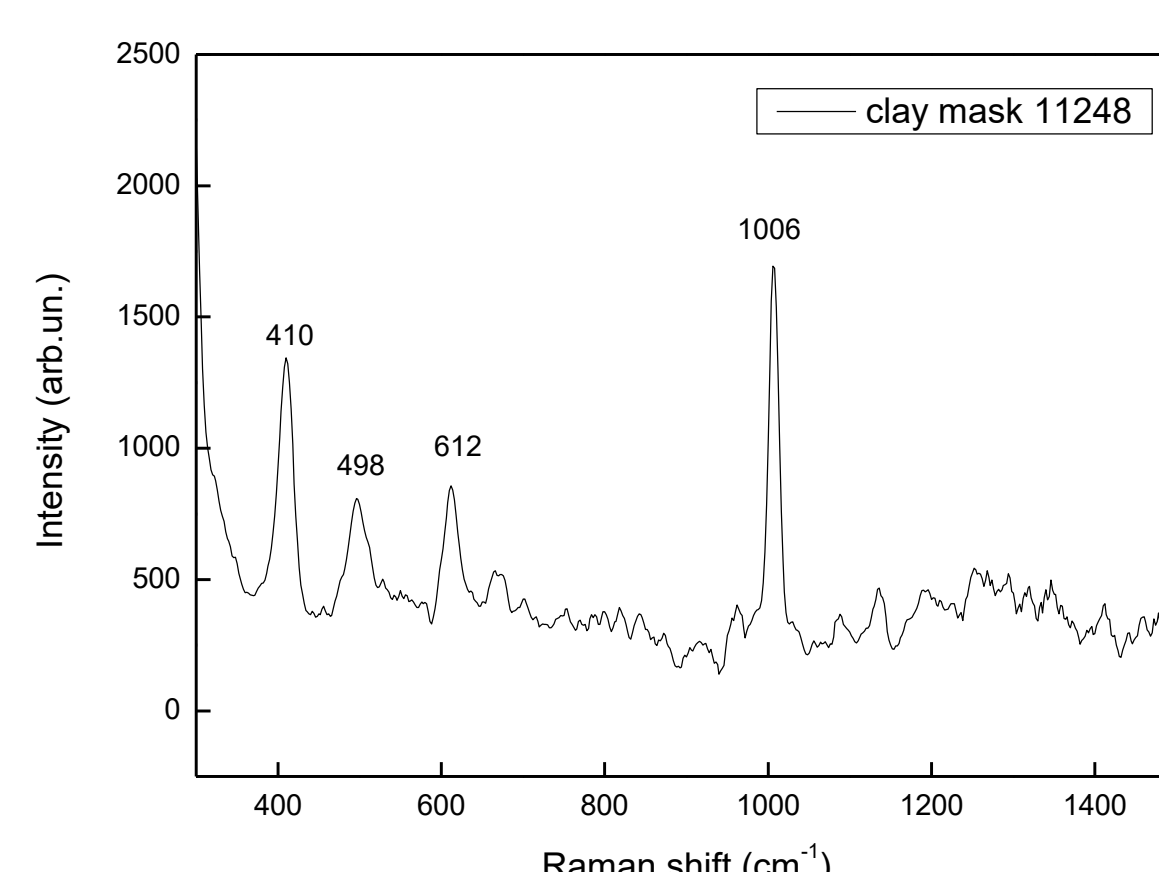
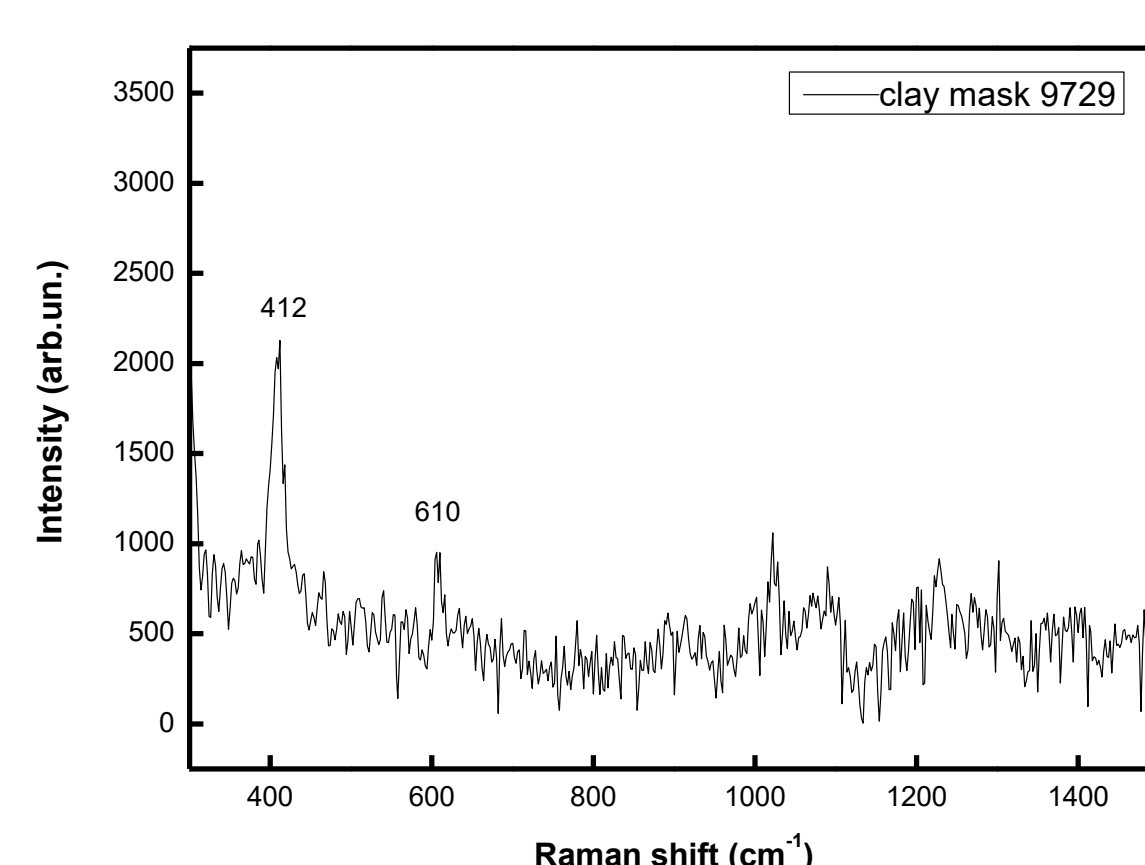
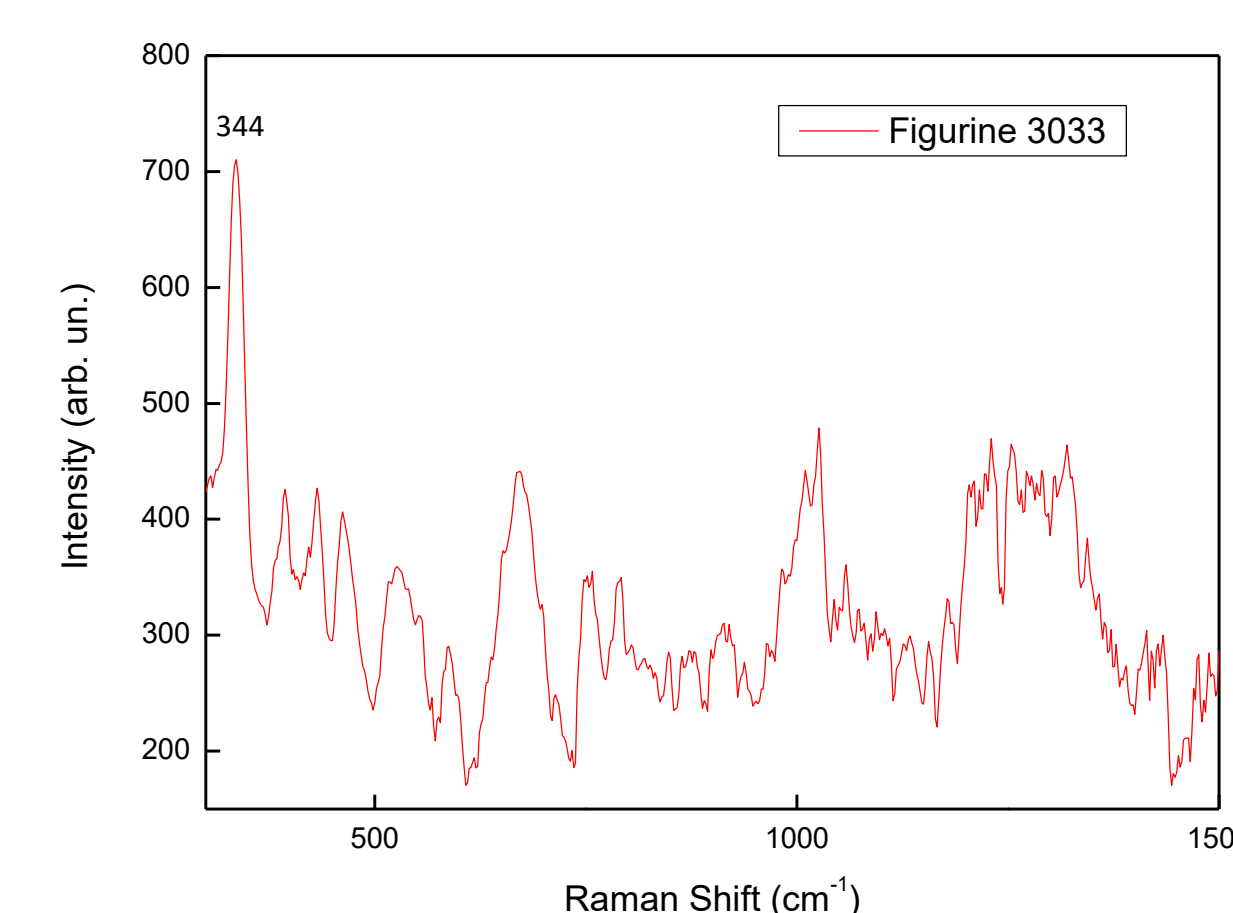


Fig. 1 A) Lenone – N° 9729 and B) N° 11248 – Giovane dalla chioma ondulata

In Fig. 1 we report the mask N° 9729 representing "Lenone" and N° 11248 representing a "Giovane dalla chioma ondulata" and Raman spectra acquired on red pigment. Both spectrum shown the bands at 412 and 610 cm⁻¹ attributable to hematite pigment.

In Fig. 3 we report the figurine N° 3033 and the Raman spectrum of red line. The spectrum show a band at 344 cm⁻¹ attributable to cinnabar pigment.

The pigments are consistent with historical period of production.

References

- [1] Le maschere fittili di Lipari: nuove riflessioni sulle espressioni artigianali liparesi di IV e III sec. a.C., M.A Mastelloni, in *Dialoghi sull'Archeologia della Magna Grecia e del Mediterraneo*, II, M. Cipriani, A. Pontrandolfo, M. Scafuro, Paestum 2017, Paestum 2018 pp. 709-720
- [2] Burgio L., Clark R.J.H., *Spectrochimica Acta Part A*, 57, 1491 – 1521, (2001)