A MULTI-ANALYTICAL STUDY FOR THE CHARACTERIZATION OF PIGMENTS FROM AN EGYPTIAN ARTIFACT OF THE LATE DYNASTIC PERIOD

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The present research aimed to investigate and recognise the colour palette utilised for decorating an ancient Egyptian artifact belonging to the period between the XXVI and XXX dynasties. The importance of these types of studies lies in achieving the complete knowledge with regard to the materials and pigments used by ancient Egyptians and their manufacturing techniques. Those information could be helpful to have clues on dating the manufacture and contextualise it geographically and historically. In this specific archaeological field, it is also important to keep in mind that every shade in ancient Egypt had a symbolic meaning.

In this study, six micro-fragments were taken from the cover of an anthropomorphic sarcophagus dated to the Late Dynastic Period and belonging to a private collection (Figure 1). White, red, green, light-blue, blue-black and black areas were analysed by a multi-analytical approach employing Raman spectroscopy, Scanning Electron Microscopy hyphenated with an Energy Dispersive X-Ray (SEM-EDX), Attenuated Total Reflection – Fourier-transformed Infrared Spectroscopy (ATR/FTIR) and Visible Induced Luminescence (VIL). The latter was especially suitable for Egyptian blue identification.

All samples showed the characteristic features of calcite and silicate minerals in their FTIR spectra; white, green, and blue-black samples also exhibited the presence of calcium sulphate. For the white and red micro-fragments, spectroscopic techniques and SEM-EDX highlighted the presence of calcite and red ochre, respectively. Unfortunately, for the other micro-fragments, no information was obtained by Raman spectroscopy because of their high luminescence signal. The green fragment analyzed by SEM-EDX highlighted the presence of green earth, which has been recognised as the minerals celadonite and glauconite thanks to the ATR-FTIR spectrum. The light blue, blue-black, and black fragments analyzed by SEM-EDX showed the presence of a copper-based pigment; furthermore, the ATR-FTIR spectrum of the light blue sample contains the characteristic bands of Egyptian blue and this result has been confirmed, also for blue-black pigment, by VIL analysis. In conclusion, this multi-technique approach allowed the identification of the colour palette of the ancient coffin and also, highlighted the possible presence of organic materials, whose characterisation is ongoing.

Fig. 1 – Upper part of the anthropomorphic sarcophagus

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