CHARACTERIZATION OF PREHISTORIC ROCK ART
PIGMENTS FROM THE MEDITERRANEAN CENTRAL
REGION OF SPAIN


* Università ‘Sapienza’ di Roma (Italy)
** Universitat de València (Spain)
Correspondence: novellifrancesca@gmail.com

ABSTRACT

The aim of this research was to characterize the pigments used in the mobilized and parietal rock art from the Parpalló cave and Calicanto shelter (Valencia, Spain). Parpalló is considered a key reference site in the Mediterranean Spain because of its enormous slate collection that covers all levels of the Upper Paleolithic Age. Calicanto shelter has instead parietal figures dated to Neolithic period and catalogued as Levantine and Schematic artistic style. Energy Dispersive X-Ray Fluorescence (EDXRF), Total-Reflection X-Ray Fluorescence (TXRF), and Spectroscopy were the techniques used to analyze the pigments. Furthermore, a mineralogical study to characterize the Parpalló’s rock support was carried out using Reflective/Transmitted Light Microscopy, Micro-Raman, X-Ray Diffraction (XRD) and Electron Microprobe Analysis (EMPA). Iron oxides/hydroxides, manganese oxides/hydroxides and carbon black based pigments were detected in red, yellow and black paints. All the samples presented a quite uniform mineralogical composition and they were classified as sandstones with a matrix of carbonate cement.

AIMS OF THE RESEARCH

• Characterize the black and yellow pigments used in the Parpalló’s (Fig.3) slabs collection;
• Characterize the red pigments used in the Calicanto’s (Fig.4) paintings;
• Try to distinguish the anthropic or geologic origin of some red coloured areas onto the rock surface;
• Evaluate the efficiency of the spectroscopic techniques (portable and non-portable, non-destructive and micro-destructive) for the analysis of rock art paintings.

ANALYTICAL TECHNIQUES

PIGMENTS CHARACTERIZATION

- Energy Dispersive X-Ray Fluorescence (EDXRF)
- Total-Reflection X-Ray Fluorescence (TXRF)
- Spectroscopy

SUPPORT CHARACTERIZATION

- Reflective/Transmitted Light Microscopy
- Micro-Raman
- X-Ray Diffraction (XRD)
- Electron Microprobe Analysis (EMPA)

CONCLUSION AND FURTHER INVESTIGATION

- It was possible differentiate the black pigments in two groups: manganese based pigments and carbon based pigments;
- Iron oxides/hydroxides is the main component of red and yellow pigments;
- In some cases it was possible to distinguish a coloured anthropic spot from a natural spot valuating the correlation between the intensity of the Fe and Ca Fluorescence peaks related to the colored area and those related to the rock support;
- The colometric analyses helped us to distinguish the black painted areas from the unpainted ones (rock support) on the Parpalló’s slabs;
- A mineralogical study on the rock support was made using Micro-Raman, XRD and EMPA. Were detected Calcite, Dolomita and Lepidocrocite as main compounds.
- Further investigation will concern the application of the Micro-Raman on the pigment grains adhered on the cotton tips used to take samples and in-situ, directly on the paints.