Conserving Cultural Heritage

Editors
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Technological characterization of polychromies on a Balearic medieval stone altarpiece of the 15th century

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ABSTRACT: The objective of this research is to increase the historical, artistic, and material knowledge of the polychrome finishes in a medieval stone altarpiece within the context of the island of Mallorca. There are many examples of Gothic art introducing polychrome finishes on stone sculpture, both in the religious and civil sphere in the Iberian Peninsula. In the Balearics, with the Christian conquest, this practice was also extended. The Passio Imaginis Altarpiece (1448–1453), located at San Salvador Sanctuary in Felanitx (Mallorca) has been studied. The characterization of the polychromies began with an organoleptic examination and photograph of general visible light and flush, assessed by digital image analysis (DIA). DIA allowed to reveal traces of polychromies that had not been detected by naked eye in order to carry out the proper sampling. The samples were analyzed by optical microscopy (OM), scan electron microscopy (SEM-EDX), and the study of organic binders. The results obtained in the stratigraphic studies revealed the application of a sequence of layers with pigments that do not provide data on the chronology but coincide with medieval symbolism of colour and pigments employed in Iberian Peninsula. Binders detected are egg or animal glue. Data indicates that it is most likely an original finish. Colour study contributes through the knowledge of the Passio Imaginis altarpiece and the awareness of its remains, to avoid the interpretation and/or destruction of the pictorial strata present in stone carvings.

1 INTRODUCTION

The Passio Imaginis Altarpiece is currently situated at San Salvador Sanctuary in Felanitx (Mallorca) (Fig. 1) but initially it was created to decorate the chapel of the Passio in the church of San Miquel, in Felanitx.

The Altarpiece is constituted by a structure of 2.70 × 2.40 m formed by three bodies and three stories that divide the space into 8 panels and a predella. Its iconography is dedicated to the Crucifixion, the resurrection, the Christ of Beirut and the Holy Supper.

Although there is controversy about the authorship of the sculpture, it seems that the most accepted theory points to胡安·巴尔纳 as the sculptor of the altarpiece, carved between 1448–1453 on a sedimentary stone with a unique iconography in Europe about the Christ of Beirut.

The name of the painter, Joan Mural, is revealed through a legal document of 1453, in which Bartomeu Rabassa, heir of the painter Joan Mural, claims to the judges a debt that Jordi Sabet (patron of the altarpiece), would have left to duty to his predecessor.

2 METHODOLOGY

The characterization of the polychromies began with an organoleptic examination and photograph with visible light and flush, assessed by digital image analysis (DIA) to decide sampling (Fig. 3). This technique is based on the use of image processing software (GIMP), which allows us to modify the lighting, contrast and saturation values.

Figure 1. St. Salvador is located in Felanitx.
The samples were embedded in resin and studied first using an optical microscope LEICA DM 4000M, with digital colour camera Scion model CFW 1300C coupled to a PC with Scion VisiCapturing V2.0 management software from Scion Corporation.

After that, the samples were studied using a Scanning electron Microscopy SEM JEOL microscope model JSM-5600 LV, equipped with an INCA X-ray X-ray dispersive energy sensor for the determination of the elemental composition of the pigments and inorganic loads.

Finally, a study has been carried out with the study of organic binders for the qualitative identification of the binders by specific reagents for functional groups: Fuchsin and Lugol. The reagent is applied for a few minutes, followed by washing and confirmation of any change under OM. The acidic fuchsin reacts with the functional group of the proteins; stains the animal’s tail with a strong red and with a soft red the other proteins. Lugol, on the other hand, reacts with the polysaccharides; staining the preparations to the grey with violet; amylose blue, red or violet amylpectin, and red or violet dextrin.

### 3 RESULTS

#### 3.1 Stratigraphic structure

DIA reveal the traces of conserved polychromy, characterizing its colour (Table 1) and guide the sampling process. In addition, it has made it possible to identify flesh, to locate different shades and to highlight detail of the surface texture.

The sampling points indicate that the altarpiece was probably entirely polychrome in origin.

Thirty-five samples were analyzed. The results obtained in the stratigraphic studies revealed the application of a sequence of layers whose initial thickness is between 120–230 microns and decreasing in thickness as the exterior to approximately 30–40 microns, composed of calcite and/or white lead preparation.

#### 3.2 Pigments composition and binders

The pigments identified (Table 2) not provide conclusive data about their chronology. They are some of
those used since antiquity. Even so, we know from J. Rivas that are materials also used in other examples of equal chronology and typology of the Peninsula Iberica. Binders detected are egg or animal glue.

The preparation of the pigments is done by manual grinding and without the selection of grains, giving the heterogeneity of the size of the grains. The application seems to have been done using flat colors, giving the lack of pigment mixtures.

4 CONCLUSIONS

It conserves scarcely 10% of the polychrome, although in origin it must have been totally polychrome. The pigments identified do not provide data on the chronology but coincide with medieval symbolism of colour and pigments employed and with other examples of the same chronology, documented in Iberian Peninsula. Binders detected are egg or animal glue, materials that we find detailed in the inventories of certain medieval painters of the island. The layers are applied with flat colors made with pigments and loads, which results in manual grinding without grain selection. All this indicates that it is probably an original polychrome finish.

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