

A Comparative study of Cypriote Wall Paintings from the Christ Antiphonitis's Monastery: Disclosure of two Artists

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The church of Christ Antiphonitis's monastery near Kalogrea, district of Kyrenia in Cyprus, is decorated with wall paintings that date at the last decades of fifteenth century. Two great and elaborate scenes, the Last Judgement and the Root of Jesse, survived in the church of Antiphonitis until the Turkish invasion (1974) and then they were cut in square pieces, detached and sent by looters to Germany with destination the illegal market. The German Police returned thirty-two pieces of them to the halls of the Archbishop Makarios Foundation in Nicosia. The present analytical study of ten fragments has been carried out within the frame of the InfrArtSonic project funded by the 6th FP, combining μ Raman and FTIR spectroscopies, optical microscopy (OM) and scanning electron microscopy (SEM/EDS). The palette is made up of eight pigments, identical in both scenes: calcite, carbon black, yellow ochre, red ochre, green earth, cinnabar, red lead (minium) and smalt. However, the stratigraphy and the scale of the shades, along with the plaster composition, vary significantly between the two scenes. This suggests the working of two artists, who in all probability belonged to different workshops and worked independently, possibly in different periods. Moreover, interpretation of the results allowed identification of several degradation phenomena, namely, i) smalt discolouration and loss; ii) degradation of red lead from orange Pb_3O_4 to black PbO_2 ; iii) presence of resin (restoration material) and of oxalates in the paint surface, which caused a certain impact in the aesthetic of the representations.



Figure 1 The monastery of Christ Antiphonitis, near Kalogrea Kyrenia, Cyprus.



Figure 2 The Last Judgement (left) and the Root of Jesse (right), last decades of the fifteenth century. North and south walls in the nave, church of Christ Antiphonitis, before the Turkish invasion. (Photos: A. and J. Stylianou). The locations of the ten fragments under study are indicated.

Description of the scenes

The Last Judgement covers part of the two pillars attached to the north wall and the recess formed between them (fig. 2-3, left). In the lunette, Christ is enthroned in an oval “mandorla” with golden rays emanating from His body. On His left knee rests the Book of Judgement. The Virgin Mary and St John the Baptist are depicted on either side, followed by angels. Below, on the left are painted the choirs of the saints divided into three groups: the martyrs, the prophets and the hierarchs. In the centre, below Christ’s feet, is the Preparation of the Throne. From below Christ’s feet issues the river of the fire, which encircles the personification of Hell. The seated Apostle-judges are depicted on the pillars on either side. In the last zone is represented Paradise; St Peter, with keys in hand, unlocks its gates and leads the Just into it, while the penitent thief, Abraham, and the enthroned Virgin Mary have already taken their places inside the Garden of Eden.

The Root of Jesse on the south wall (fig. 2-3, right) depicts Jesse, father of the King David, reclining on the ground, with a conventional tree springing from his body and enveloping in its foliage a multitude of figures showing the genealogical descent of Christ. Immediately above Jesse we see King David, and on the left King Solomon. At the top of the tree is shown the Virgin Mary with Christ.

Methodology

In the present work four fragments from the representation of the Last Judgement (fig. 4) and six from the Root of Jesse (fig. 5) have been examined. A representative number of samples of the most characteristic colour shades and gradations were selected for the identification of the materials and the investigation of the painting technique



Figure 3 Antiphonitis's church after the vandalism. The north (left) and south (right) walls in the nave with the Last Judgement and the Root of Jesse in the central part.



Figure 4 The four fragments from the Last Judgement.



Figure 5 The six fragments from the Root of Jesse.

Optical Microscopy

Samples were mounted in polyester transparent resin and the cross-sections were ground and polished using a Struers Planapol-V machine. Observation and photography of the samples' surface before embedding and of their cross-sections was achieved using a Zeiss Axiotech 100 HD polarizing microscope, equipped with white reflected and ultraviolet light as well as with a SPOT 2 1.4 digital cooled camera (res.: 1315x1033 pixels, 12 bits per colour).

FTIR Spectroscopy

FTIR spectra were measured with a Biorad FTS 175 FTIR spectrophotometer. The samples were ground finely with anhydrous potassium bromide (KBr) and the powder mixture was then crushed in a mechanical die press to form a translucent pellet. All spectra were collected in absorbance mode at 4 cm⁻¹ resolution, representing averages of 64 scans.

μRaman Spectroscopy

A Renishaw System 1000 micro-Raman spectrometer comprising an Olympus BH-2 imaging microscope, a grating monochromator and a charged-coupled device (CCD) Peltier-cooled detector was employed for Raman spectra acquisition. A HeNe laser (632.8nm) served as the excitation source and the beam emitted was focused using a 50x microscope objective. Low laser power (up to 2mW) was used for spectra accumulation. A set of two notch filters with a cut-off edge of ~+100 cm⁻¹ was employed for the rejection of Rayleigh scattered light. The resolution was kept at ~5cm⁻¹.

Scanning Electron Microscopy (SEM/EDS)

SEM images by back-scattered electrons (BSE) and EDS analyses were taken by a JEOL 6300 scanning microscope equipped with an energy dispersive X-ray spectrometer (EDS) ISIS 2000 microanalytical system. The elemental composition was determined using the prepared carbon coated cross-sections, which were bombarded by a strongly accelerated and focalised electron beam in a vacuum (10⁻⁵ torr).

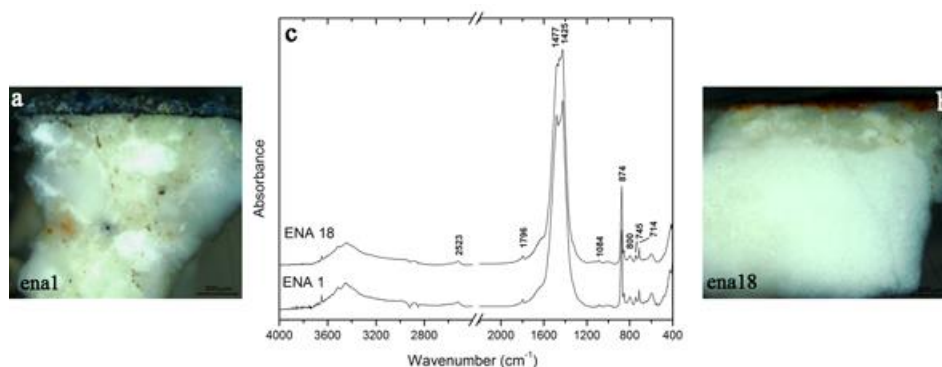


Figure 6 a, b) Cross-sections of the samples from the Last Judgement and the Root of Jesse, respectively. c) FTIR spectra of the plasters from the two samples.

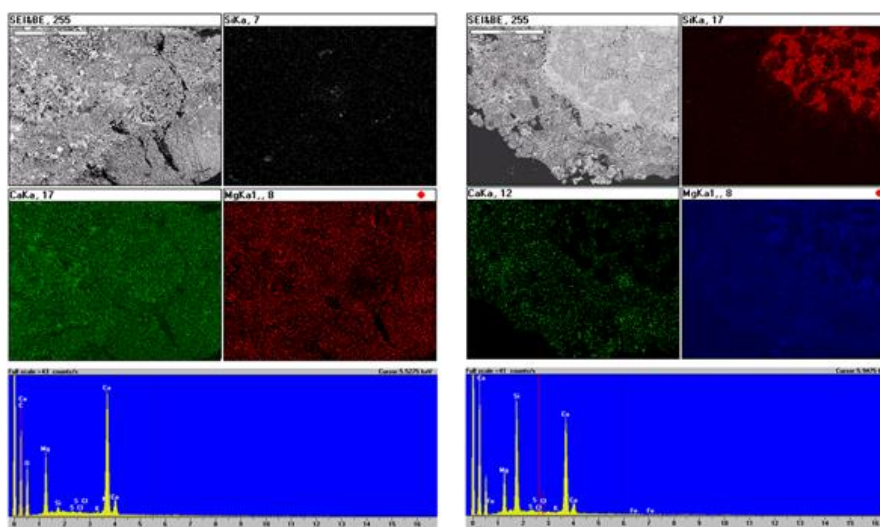


Figure 7 SEM micrographs of the samples from the Last Judgement (left) and the Root of Jesse (right), X-ray maps for Ca, Mg and Si, and the corresponding spectra.

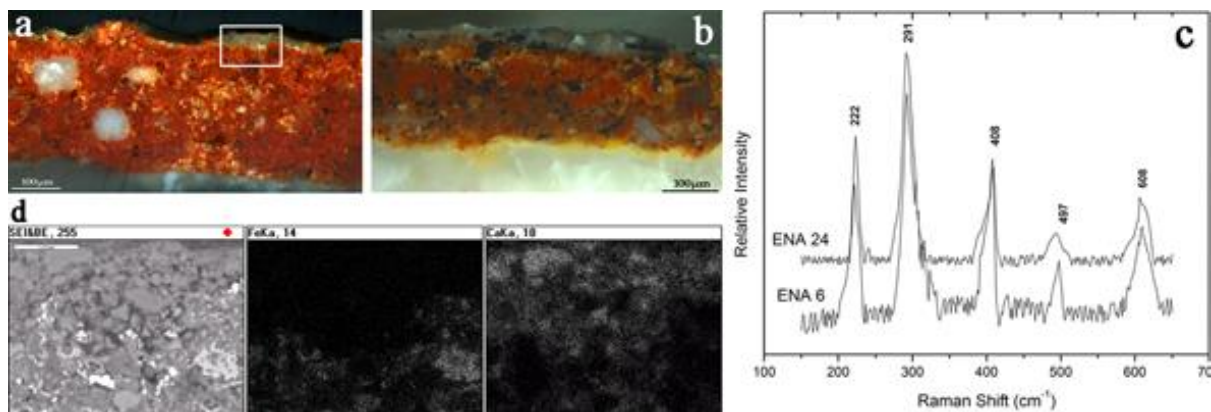


Figure 8 a, b) Cross-sections of lights in chestnut garments from the Last Judgement and the Root of Jesse, respectively. c) μ Raman spectra of red ochre from the two cross-sections. d) X-ray maps for Fe and Ca in the demarcated area of the cross-section (a).

Conclusions

Comparative examination of the Last Judgement and the Root of Jesse has verified that, despite manifest stylistic similarities, there are recognizable differences not only in the painting technique, as much in the garments as in the faces, but also in the composition and structure of the plaster layers.

Even though the ingredients of the mortars are the same (calcite, magnesite and silicates; earths were added only in the plaster of the first scene) their proportion and the final porosity differ significantly. This suggests the working of two artists, who most probably belonged to different workshops and worked independently, possibly in different periods.

The pigments of the two artists are the same and include: yellow ochre ($\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$), red ochre (Fe_2O_3), green earth ($\text{K}[(\text{AlIII}, \text{FeIII})(\text{FeII}, \text{MgII})]_2(\text{AlSi}_3\text{Si}_4\text{O}_{10}(\text{OH})_2)$), cinnabar (HgS), red lead (Pb_3O_4), smalt ($\text{CoO} \cdot \text{SiO}_2 \cdot \text{K}_2\text{O}$), carbon black (C), and calcite (CaCO_3). The two artists employed the fresco-secco technique combining lime water and protein (egg) as binders. While the stratigraphy in both works follows a similar structure, most pigment mixtures, ensuing hues and colour combinations vary significantly. It is worth mentioning that the thickness of most of the paint layers in the second scene is markedly greater from that in the first scene. By and large, the Last Judgement's colour palette embraces a greater number of saturated colours as well as certain tones, both of which are absent from the Root of Jesse. In the first scene, the modelling of the faces and of the garment folds were achieved with soft gradations, while in the second scene the rendition of the drawing is more linear. To conclude, all features in the painting of the Last Judgment bear witness to an abler and more experienced artist, who probably preceded the second one in painting this elaborate scene in the nave of Antiphonitis's church.

In the present preservation state the fragments of the scenes are subjected to several degradation phenomena: i) smalt discolouration and loss; ii) degradation of orange red lead (Pb_3O_4) to black plattnerite (PbO_2); iii) presence of resin (restoration material) and of oxalates in the paint surface. Their impact in the aesthetic of the representations is obvious and calls for an appropriate conservation treatment in order for the fragments to remain in a good state as museum objects.

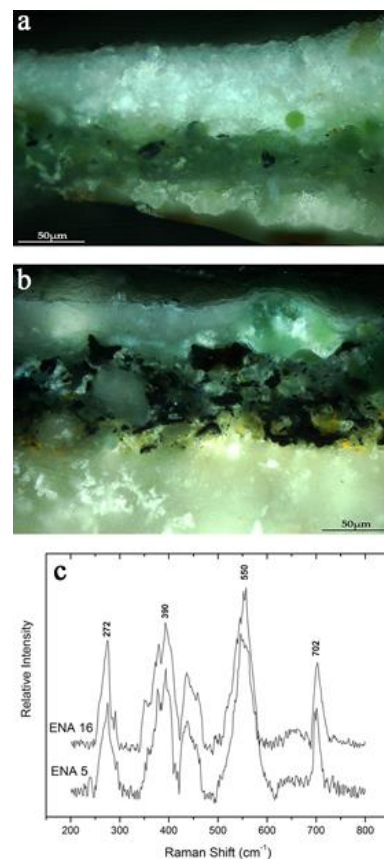


Figure 9 a, b) Cross-sections of a highlight in a green garment of the Last Judgement, and in floral decoration of the Root of Jesse. c) μ Raman spectra of green earth from the two cross-sections.