The newly discovered 18th century wall paintings in Aci Sant'Antonio

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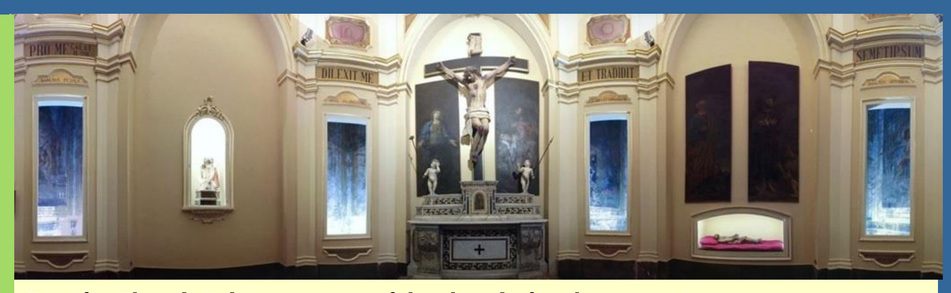
The diagnostics campaign.

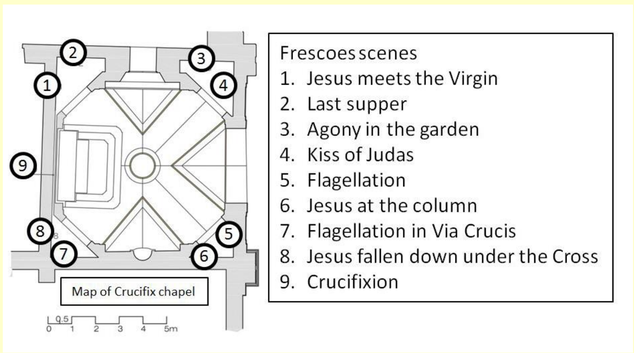
The mural paintings were first documented by CHSOS with technical photography (visible, raking light, infrared, ultraviolet fluorescence and infrared false color). Then analytical examination was performed both on-site (with pXRF) by UCSD (USA) and on 7 paint fragments collected from the floor near the murals by the Hercules laboratory (Portugal). The analytical setup comprised optical microscopy, electronic microscopy with x-ray spectrometry (SEM-EDS), X-Ray diffraction (XRD) and µFT-IR.



Crucifix Chapel. Split panorama of the chapel after the renovation.

The Crucifix Chapel.

A cycle of 18th century mural paintings was revealed in 2012 during maintenance works in the Crucifix Chapel of the Mother Church in Aci Sant'Antonio. The paintings have survived along the corners of the originally square chapel that was altered in the early 20th century, acquiring the current octagonal-shaped construction. All of the murals except the scenes on the corners have been destroyed and irremediably lost. The murals are in need of immediate conservation treatment and thanks to international academic collaborations promoted by CHSOS diagnostic documentation and conservation assessment have been performed in order to inform the planning and elaboration of the conservation project.

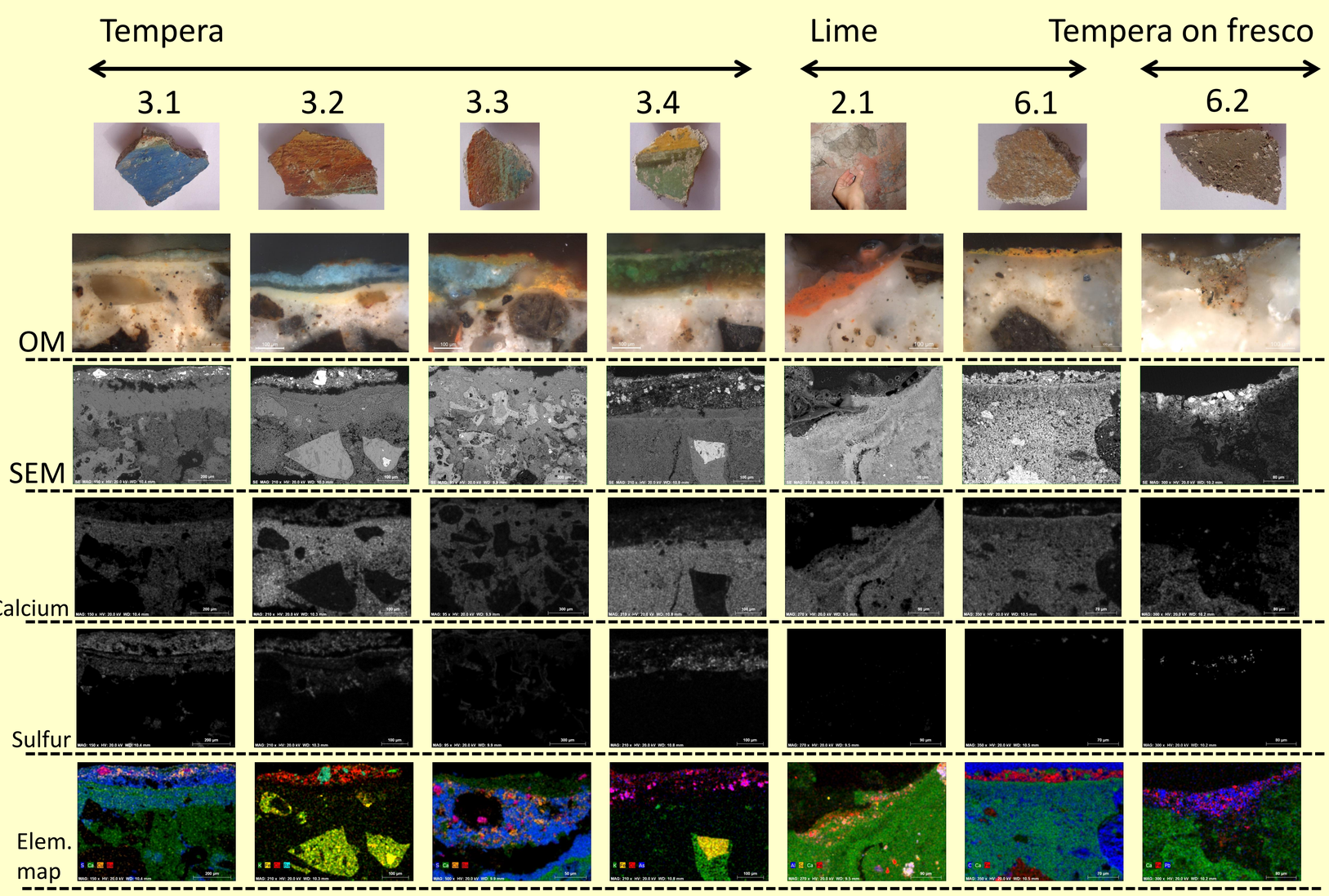


Crucifix Chapel. Floor plan with the description of the scenes.

Technical Photography

Crucifix Chapel. The 8 surviving scene of the 18th century mural paintings cycle.

Materials Characterization



Results and Conclusions

Painting technique

None of the 7 fragments analyzed showed a true a fresco techniques but different a secco methods.

Tempera painting

The analysis on samples 3.2, 3.3 and 3.4 suggests that the mortar was partially or already dry when the following layers were applied. A thin layer calcium carbonate precipitation it's observed in all these samples. Then a layer of gypsum mixed with yellow ochre was apparently laid as a ground layer. The paint was applied with a protein binder (FT-IR bands around 2961,2926,2854, 1638, 1276 cm^{-1}). Samples 3.2 and 3.3 show a much more diffused S in the mortar which could be attributed to salts. On the other hand, sample 3.1 doesn't feature the carbonation crust but show the same preparation which should have been applied on a still fresh mortar.

Lime painting

Sample 2.1 and 6.1 shows that the mortar was dry before the paint layers were laid down. A thin layer of precipitation of calcium carbonate is present in both samples. The pigments are bounded by calcite which means that they were intentionally mixed with lime (lime painting).

Tempera on Fresco

Sample 6.2 shows that the mortar was wet when the paint layer was laid down. The small amount of Ca and the presence of an oil and protein material within the paint layers suggest a tempera on fresco (wet mortar) technique.

Pigment palette

The palette was investigated with portable XRF and analytical examination on the 7 fragments. The paintings have been heavily retouched with application of new paint and consequently have been found pigments ranging from the 18th until the late 19th century.

Original	Retouches / Over painting
Azurite	Prussian Blue
Red /Yellow Ochre Green Earth	Emerald Green
Lead White	Chrome Yellow
Vermilion	Chrome Green

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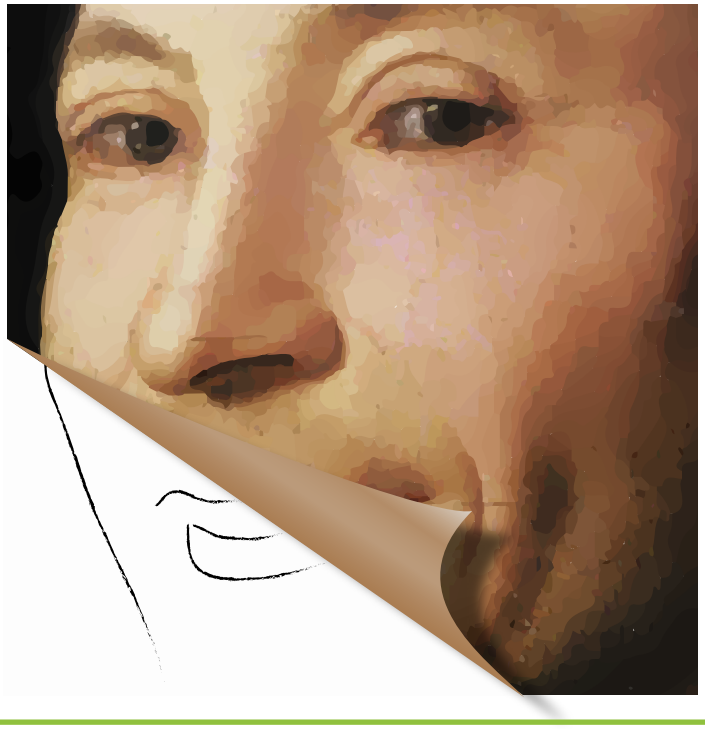

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