

Monastery of the Ascension, Ellassona, Mount Olympus, Greece: Characterization of Late Post-Byzantine Wall Paintings



E. Patsiatzi^{1*}, L. Malletzidou¹, T.T. Zorba¹, P. Beinas², V. Touli³, K. Chrissafis¹, E. Pavlidou¹, G. Vourlias¹ and K.M. Paraskevopoulos¹



¹ Laboratory of Advanced Materials and Devices, School of Physics, Faculty of Sciences, Aristotle University of Thessaloniki, GR54124 Thessaloniki, Greece

² Painting Conservator, 'Esaiechnon' Artwork Conservation Laboratory, GR60100 Katerini, Greece

³ Ephorate of Antiquities of Larissa, GR41500 Larissa, Greece

*enpatsiat@chem.auth.gr

INTRODUCTION

The Monastery of Ascension is located in Sykea, a village of Ellassona town near Mount Olympus, with a significant charitable and cultural contribution in the area. Its catholicon was constructed and painted in the mid-17th century, while the iconographer remains unknown. This work concerns the study of 17 samples of the catholicon wall paintings –including plaster and painting layers– and its purpose is the characterization and the identification of the painting technique that was used at that period of time.

METHODS

Optical Microscopy: Zeiss STEMI DV4.

μ-FTIR Spectroscopy: i-Series Perkin Elmer microscope and Spectrum 1000 Perkin Elmer spectrometer, MIR region, transmittance mode, 32 scans, 4 cm⁻¹ resolution.

SEM-EDS Microscopy: JEOL JMS-840A with Oxford ISIS 300 detector, 20 kV accelerating voltage.

Thermogravimetry: Setaram SETSYS 16/18 system. Dynamic conditions, temperature range 25-1000 °C with a heating rate of 20 °C/min, N₂. Samples of 5-8 mg in alumina crucibles.

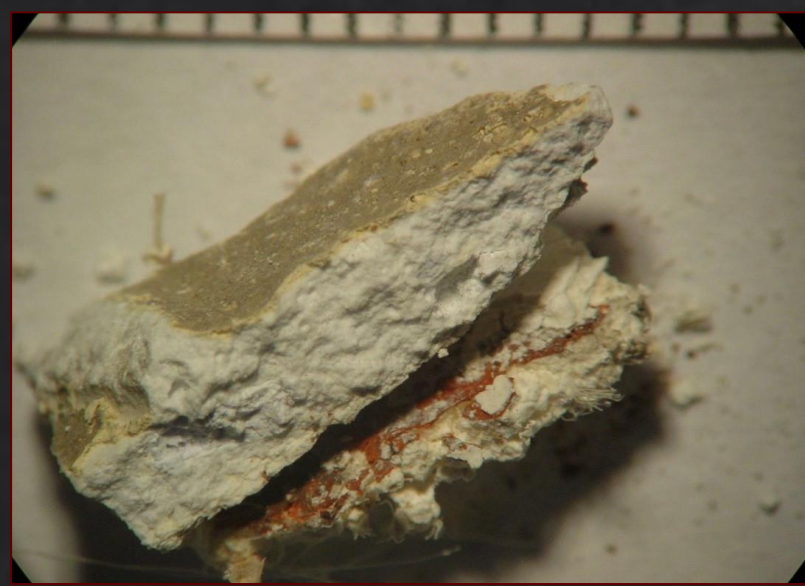
XRD: Rigaku Ultima, Bragg – Brentano, CuK_α, 40 KV, 30 mA, range (2θ): 5-90°, step size: 0.05°, count step: 1.0 s/step.



Wall painting under study, Catholicon, Unknown artist, Mid-17th century

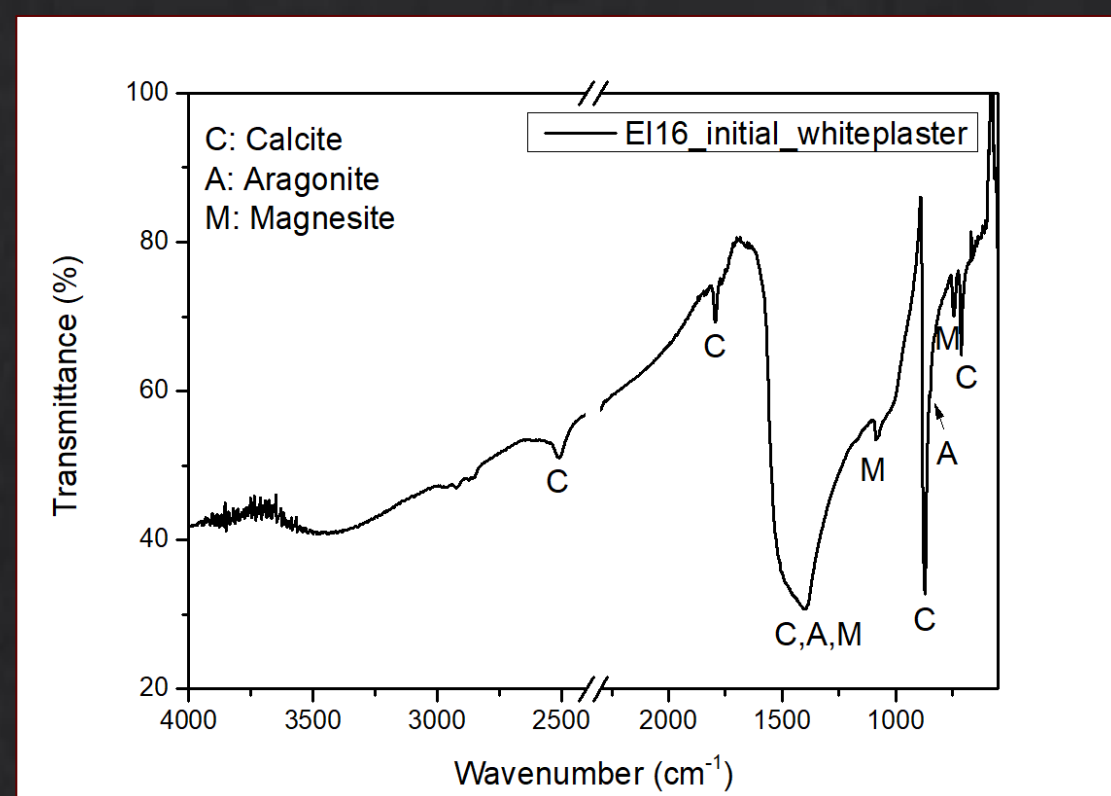
RESULTS

Optical Microscopy

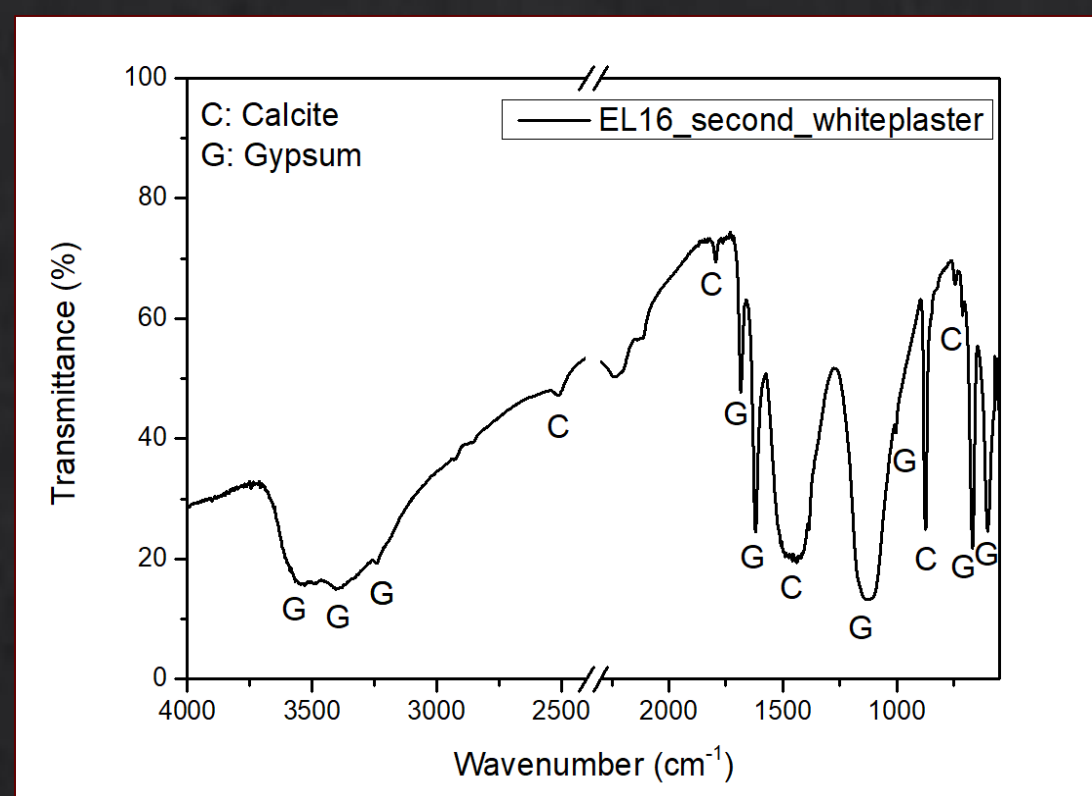


OM image of Sample E16. The presence of a second pictorial phase –including a plaster layer– is noted

μ-FTIR

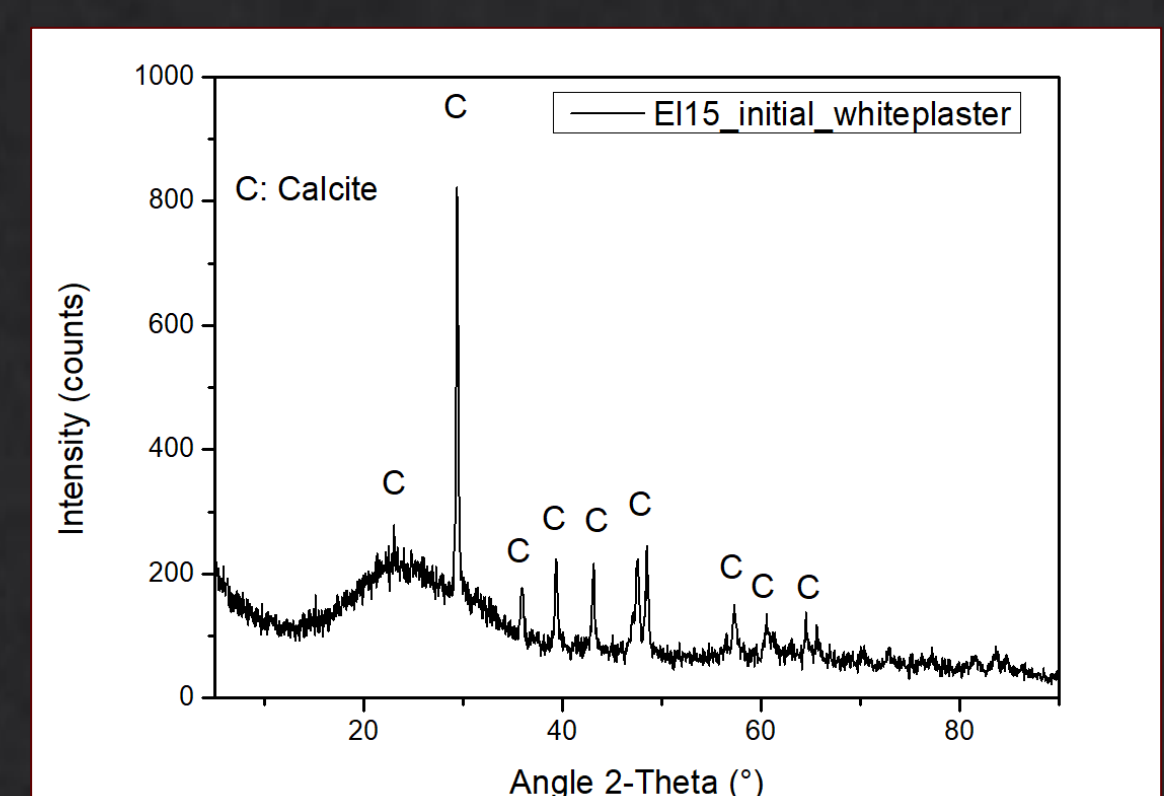


μ-FTIR spectrum of the E16 white plaster, attributed to the initial pictorial phase. Calcite, Aragonite, Magnesite, Silicates



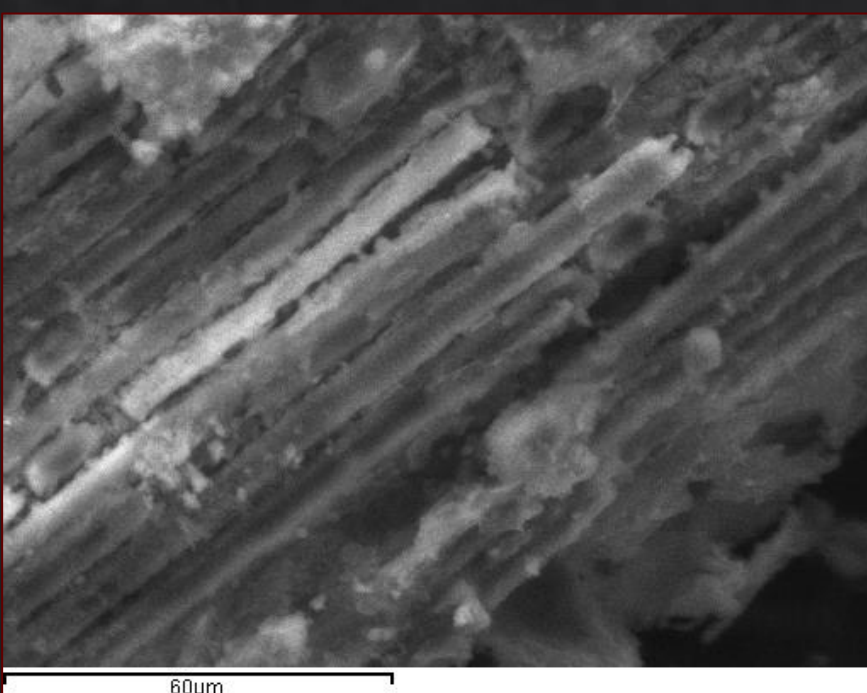
μ-FTIR spectrum of the E16 second white plaster, attributed to overpainting or to a second pictorial phase. Gypsum, Calcite, Silicates

XRD

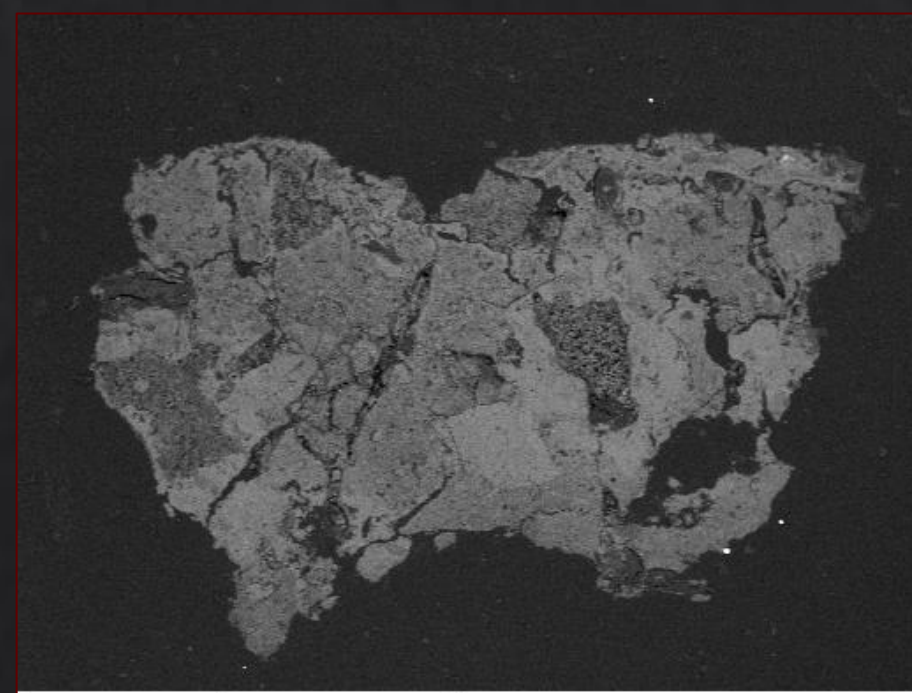


XRD pattern of the E15 white plaster, attributed to the initial pictorial phase. Calcite

SEM-EDS

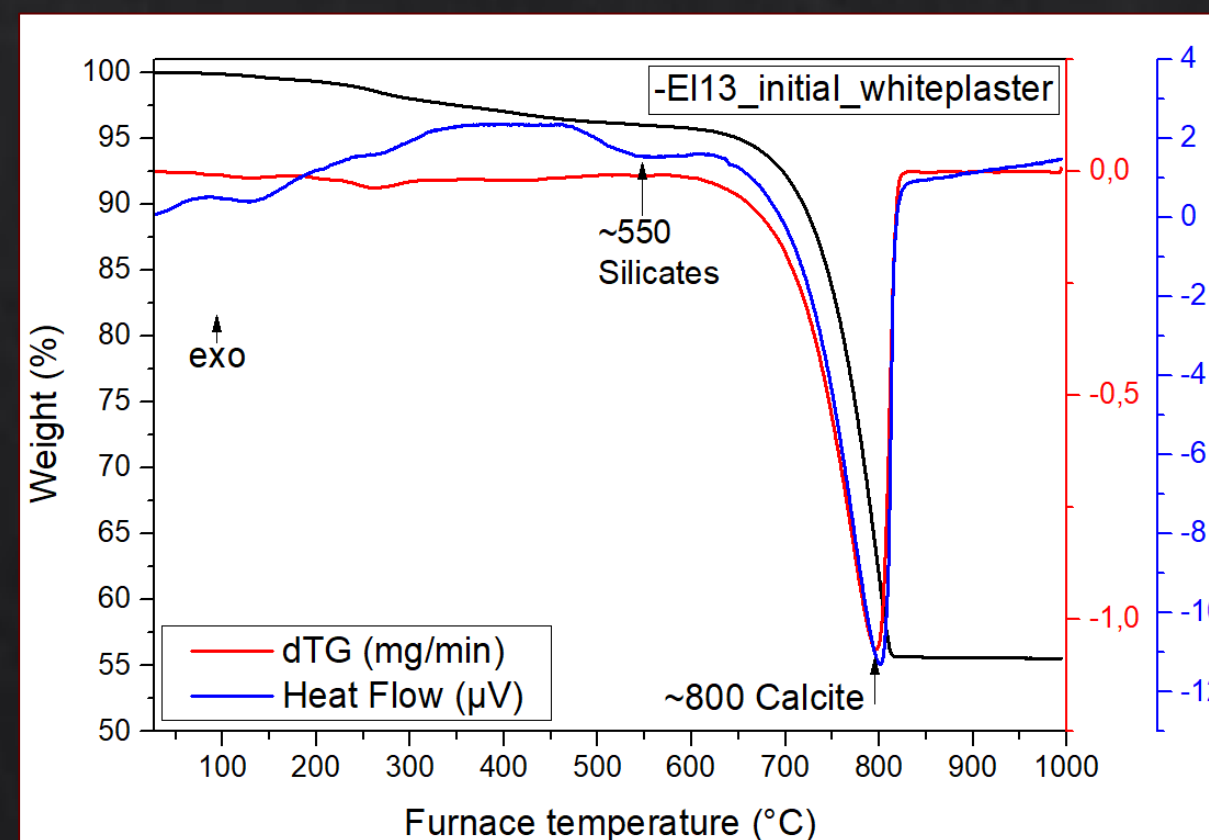


SEM image of the E12 of a wooden fiber, characteristic of the white plaster layer.

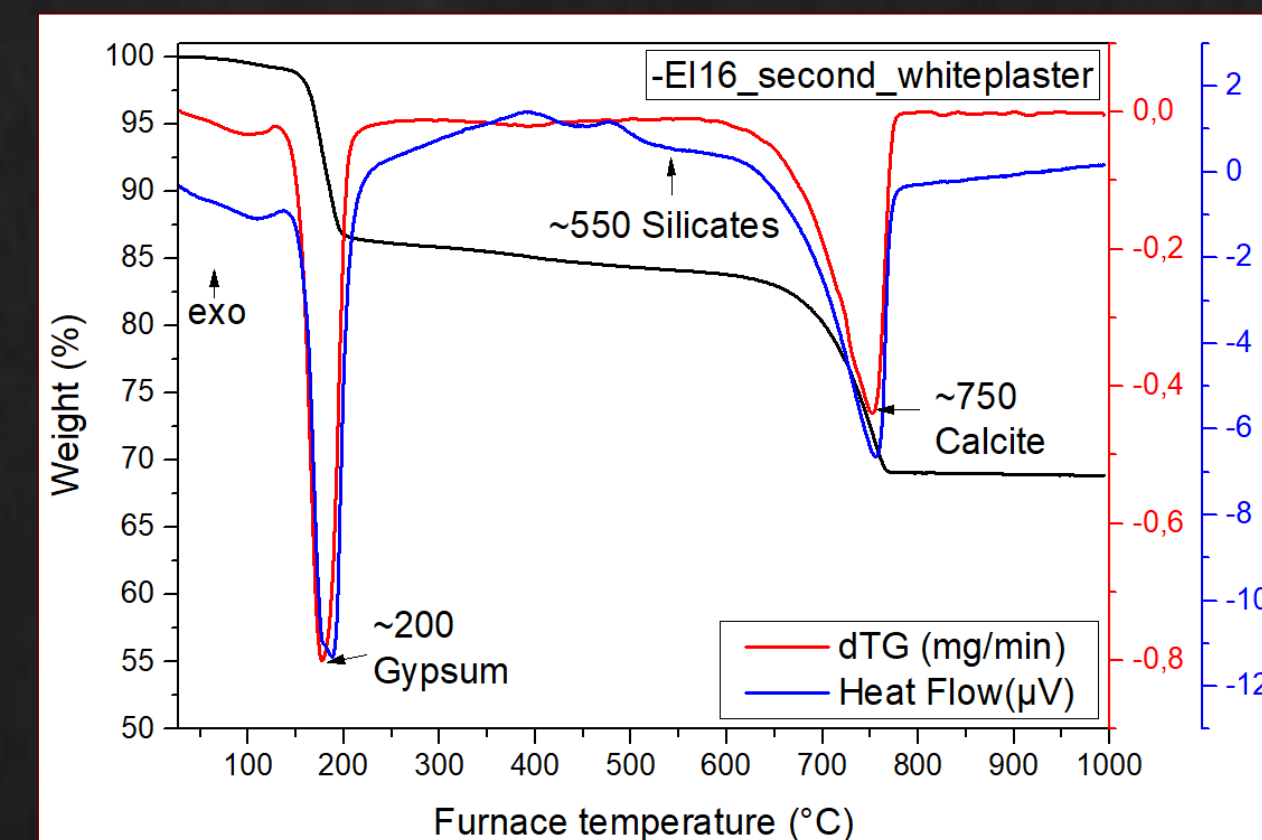


SEM image of the E16 white plaster, attributed to the initial pictorial phase. The presence of aggregates is noted.

TG



TGA thermograph of the E13 white plaster, attributed to the initial pictorial phase. Calcite and silicates



TGA thermograph of the E16 second white plaster, attributed to overpainting or to a second pictorial phase. Gypsum, Calcite and silicates

CONCLUSIONS

The combined spectroscopic and microstratigraphic results indicate the use of fresco technique; calcite with quartz and wooden fibers were used for the initial white plaster layer, with a small participation of aragonite, while –in some cases– magnesite was also identified. No organic binder was detected, the painting layers have irregular thickness – below 100 μm–, and no Ca-interface layer was detected. Overpainting was spotted in one of the samples under study, in sample E16, in the form of a second pictorial phase containing a plaster layer also of calcite, gypsum and silicates. In addition, the collected FTIR spectra of the painting layers showed the presence of Primal, which is attributed to previous works of restoration, while the sporadic presence of calcium oxalates and nitrate radicals are attributed to degradation phenomena. To sum up, the artist's palette is quite simple, as the painting layers consist of red, yellow and brown colors, while ferrous pigments (ochres), malachite and carbon black were the identified pigments, with indications of the use of lazurite.

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