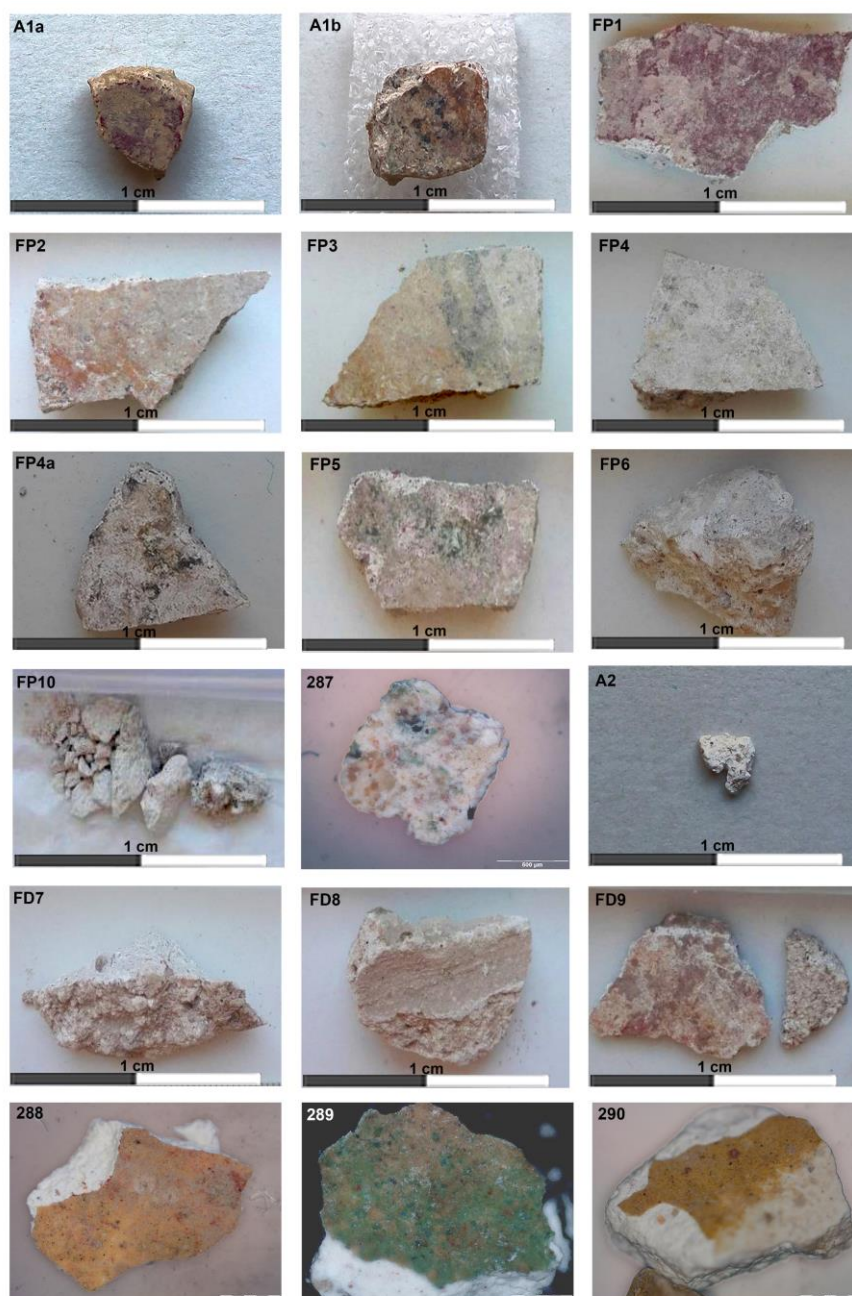
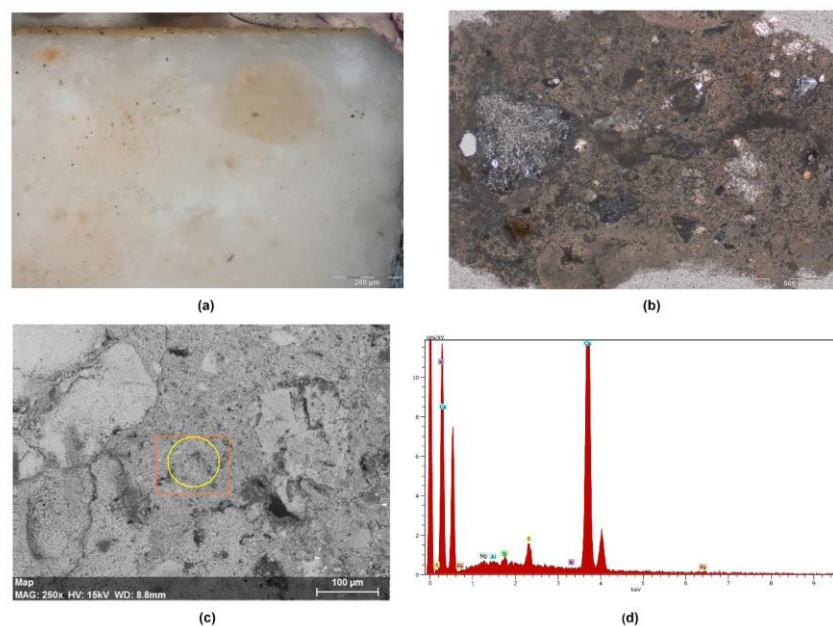


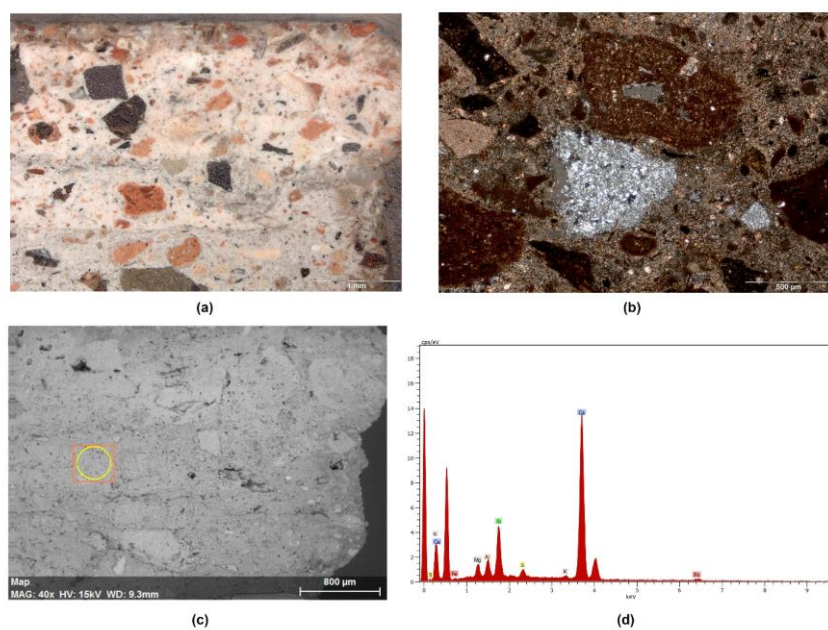
**Figure S1.** (a) Figure S1: (a) Aerial photograph of the Ardaxšīr-Xwarrah site, in the red square the location of the excavation area (photo by G. Gerster) [13]; (b) 3D model (laser scanner survey by Roberto Gabrielli of ITABC CNR for SALF) [13], in the green squares the location of the wall painting and painted floor; (c) Reconstructive hypothesis of the painted floor inside the complex [13, p. 94]; (d) Graphic elaboration of the features recognised on the wall paintings with a reconstructive hypothesis of the frames [13, p. 96].



**Figure S2.** Samples excavated in the Firuzabad archaeological area analysed in the present paper.

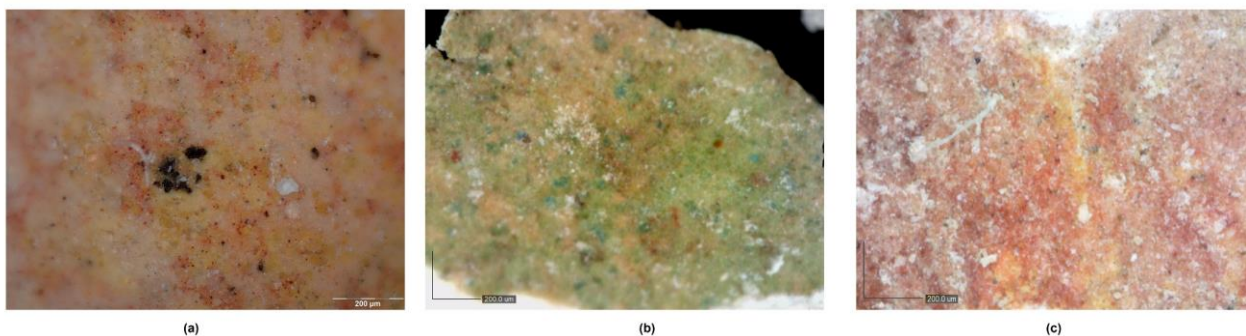


**Figure S3.** Sample 290: (a) PLM micrograph of the cross-section; (b) PLM micrograph of the thin section of microcrystalline gypsum particle; (c) SEM micrograph and (d) EDS microanalysis of the substrate.

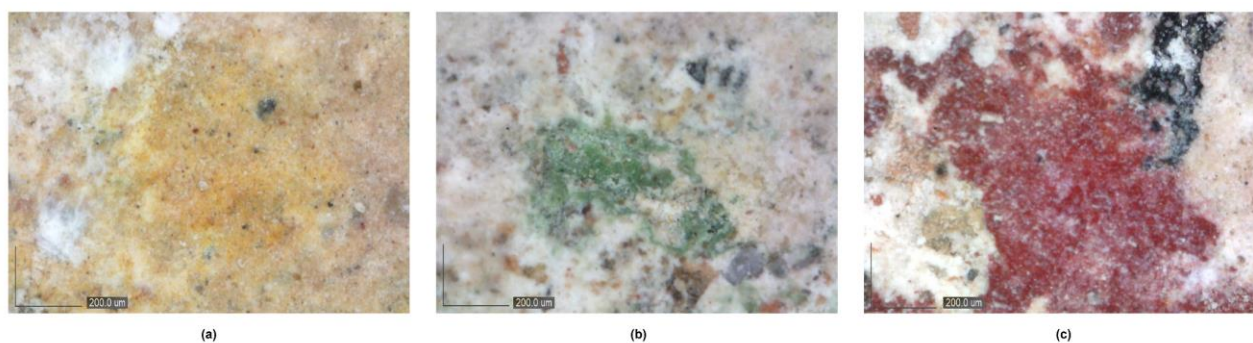


**Figure S4.** Sample FP5, cross-section: (a) PLM micrograph of the thin section of microcrystalline gypsum particle; (c) SEM micrograph and (d) EDS microanalysis of the substrate.

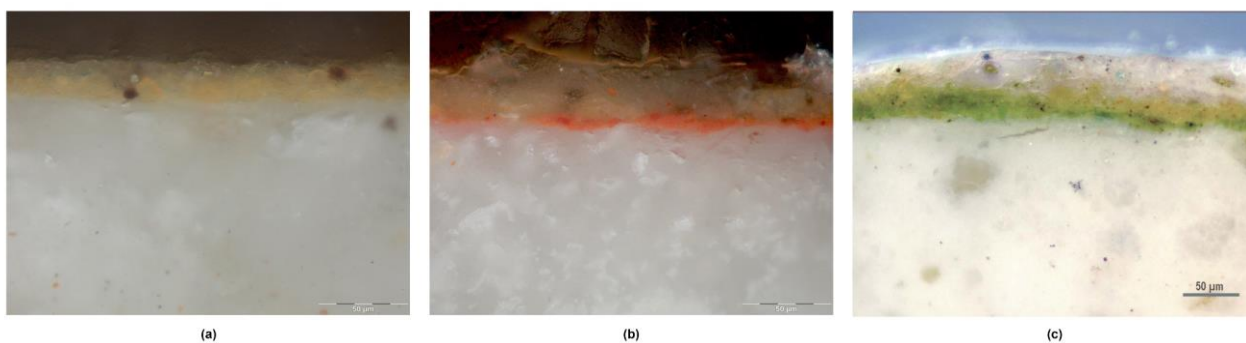




**Figure S5.** Digital micrographs of wall painting: (a) yellow hue, sample 288; (b) green hue, sample 289; (c) red hue, sample FD9.



**Figure S6.** Digital micrographs of painted floor: (a) yellow hue, sample FP2; (b) green hue, sample FP5; (c) red and black hues, sample FP1; (d) .



**Figure S7.** Cross-section of wall painting, PLM micrographs: (a) sample 290, yellow; (b) sample 288, yellow paint layer on red sinopia; (c) sample 289, green.

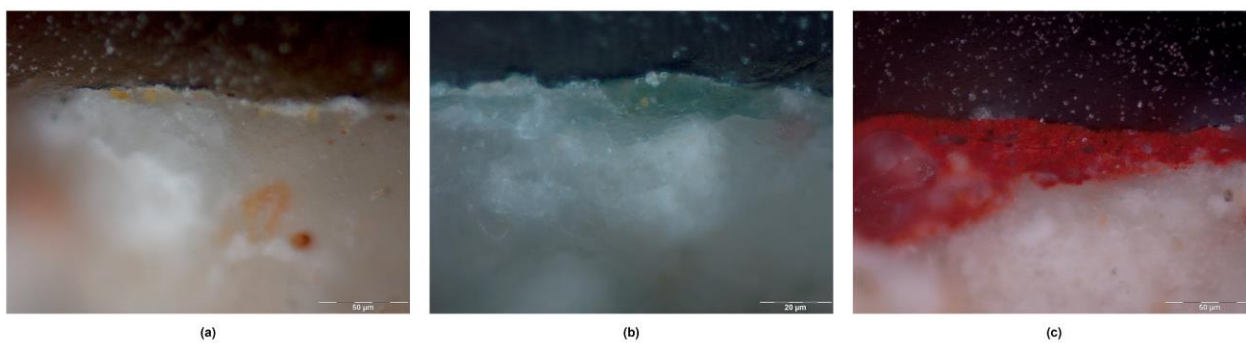
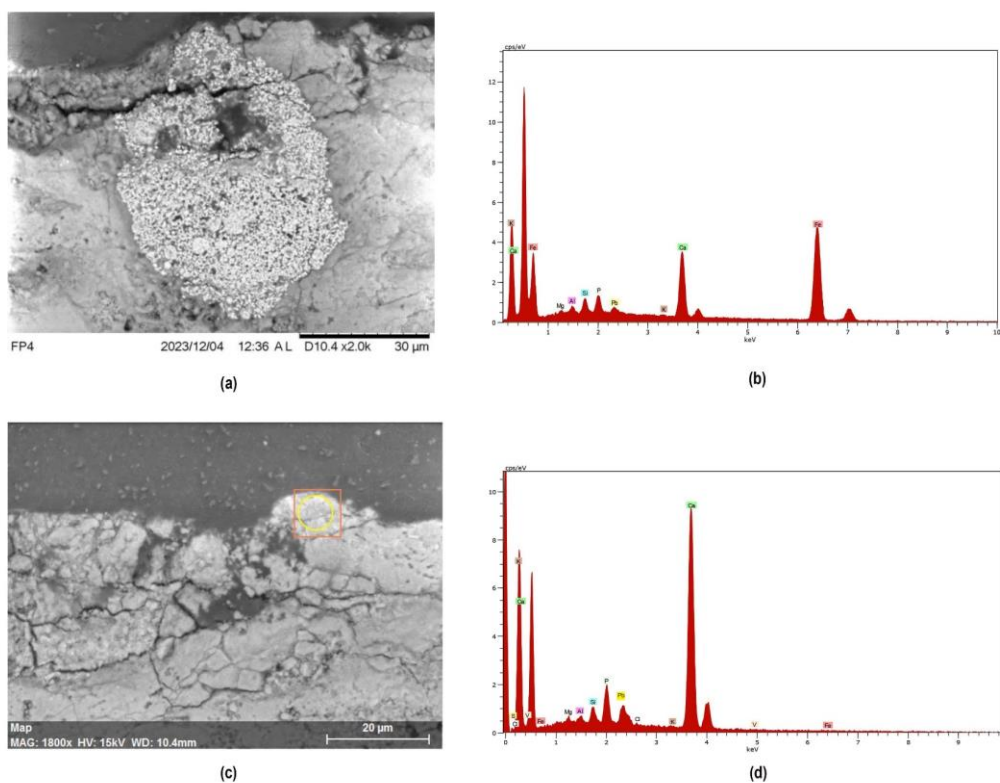
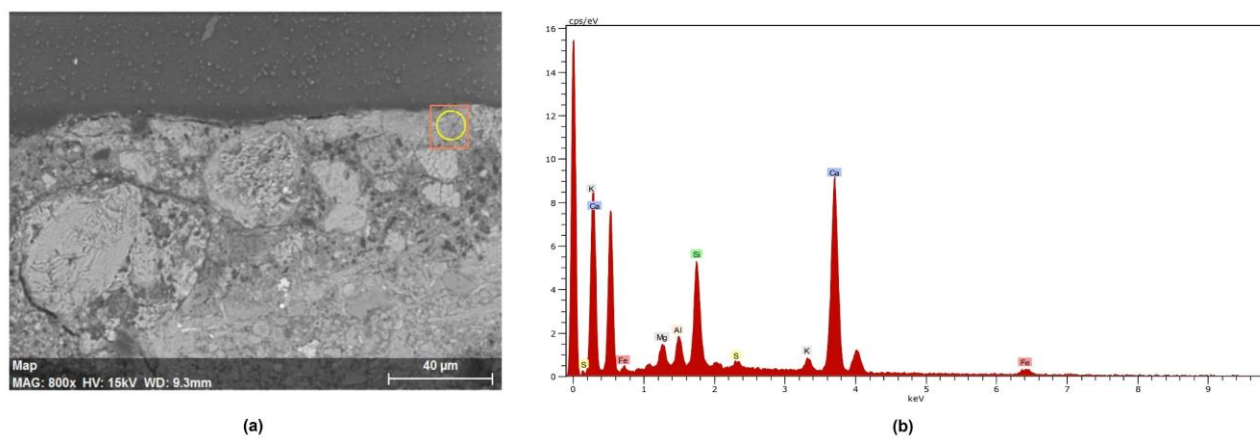


Figure 1 consists of five panels labeled (a) through (e). Panel (a) is a scanning electron micrograph (SEM) showing a dark, granular surface with a lighter, irregularly shaped region in the center. A scale bar in the bottom right corner indicates 50 μm. Panel (b) is an energy-dispersive X-ray (EDS) map of the same region, showing a complex pattern of light and dark areas. A scale bar in the bottom right corner indicates 20 μm. Panel (c) is an EDS spectrum showing intensity (cps/eV) versus energy (keV). The spectrum displays several peaks, with the most prominent ones labeled as Fe, Cu, and Ca. Other smaller peaks are labeled for P, S, K, Ti, Mn, Si, Cl, and Br. Panel (d) is an EDS map showing the distribution of phosphorus (P-KA) in the sample. The map shows a bright, irregularly shaped region against a dark background. Panel (e) is an EDS map showing the distribution of calcium (Ca-KA) in the sample. The map shows a bright, irregularly shaped region against a dark background.

**Figure S10.** Sample FP4, cross-section: (a) PLM micrograph; (b) SEM micrograph; (c) EDS microanalysis of whitish area; element distribution map of (d) phosphorous and (e) calcium.

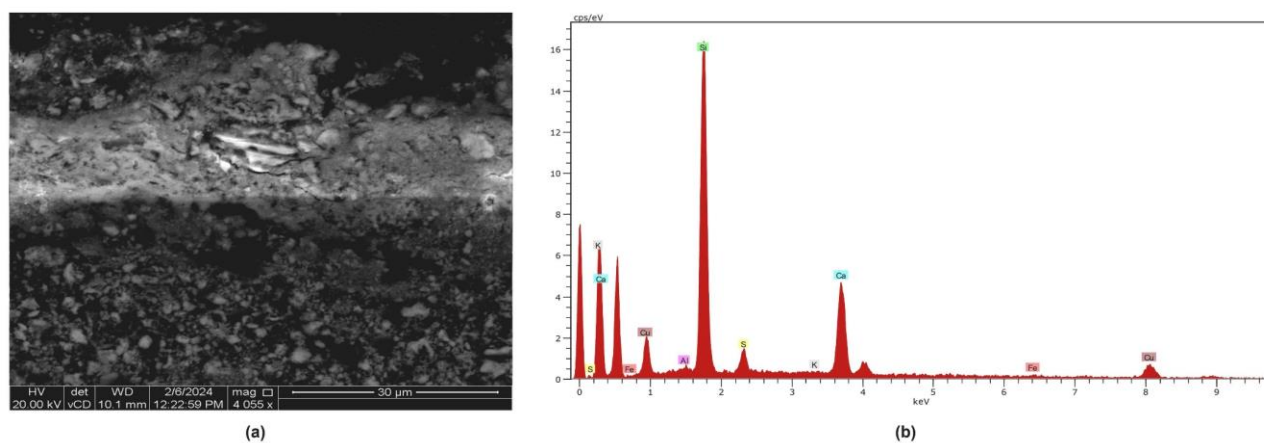


**Figure S11.** Sample FP4, cross section: (a) SEM micrograph; (b) EDS microanalysis of the Fe-rich crystals in whitish paint; (c) SEM micrograph, cross-section and (d) EDS microanalysis of the Pb-P-V-Cl rich crystals in whitish paint.

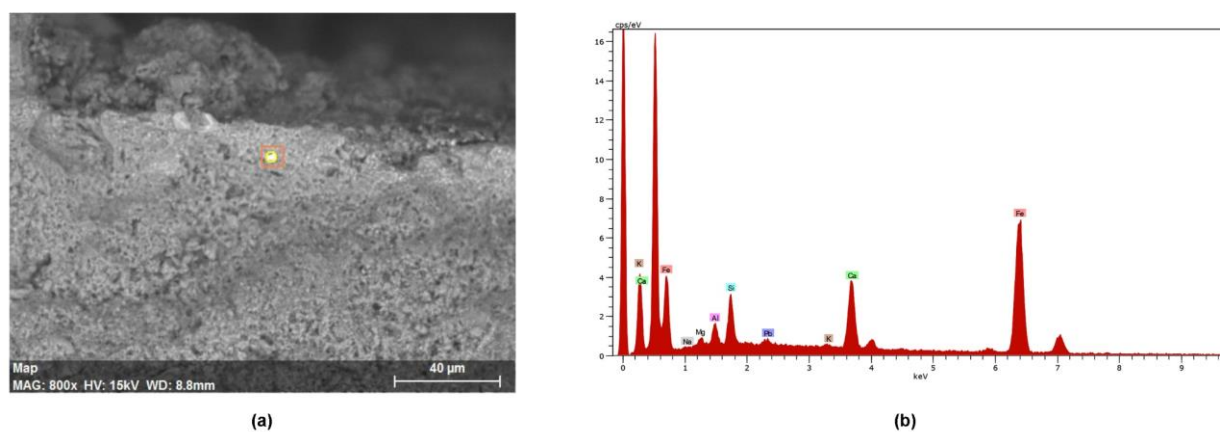


**Figure S12.** Sample FP5, cross section: (a) SEM micrograph and (b) EDS microanalysis of the green paint.

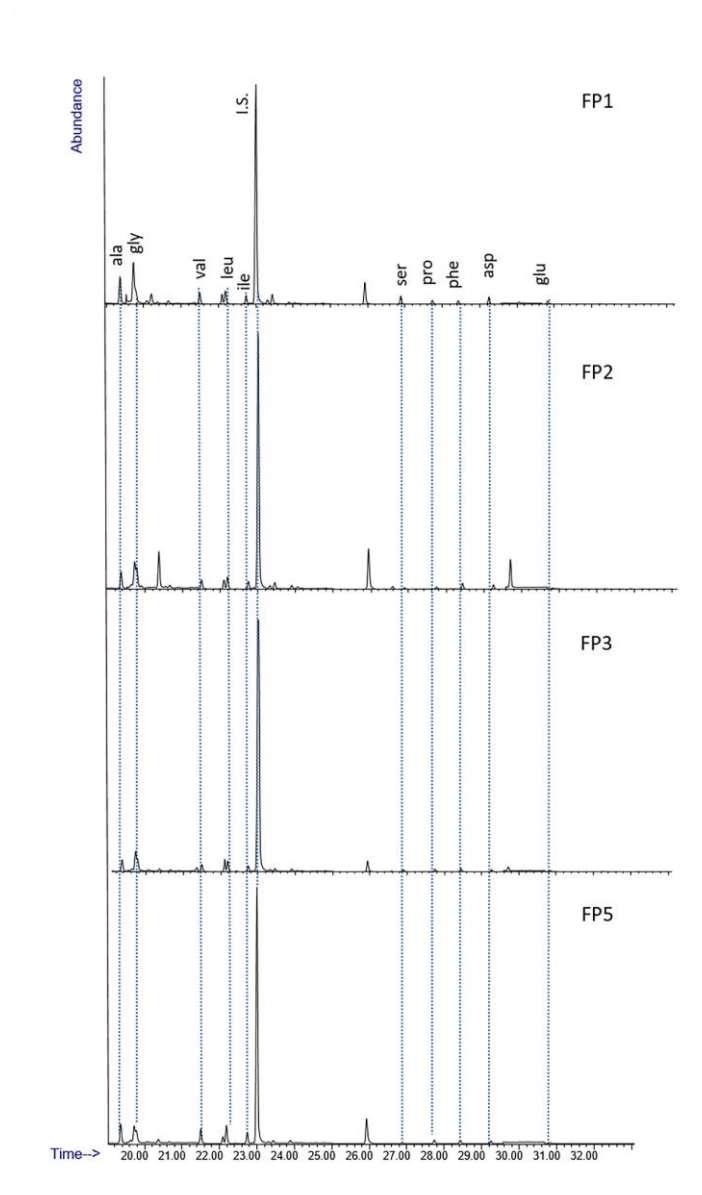




**Figure S13.** Sample 289, cross-section: (a) SEM micrograph and (b) EDS microanalysis of Egyptian Blue particle in the green paint.



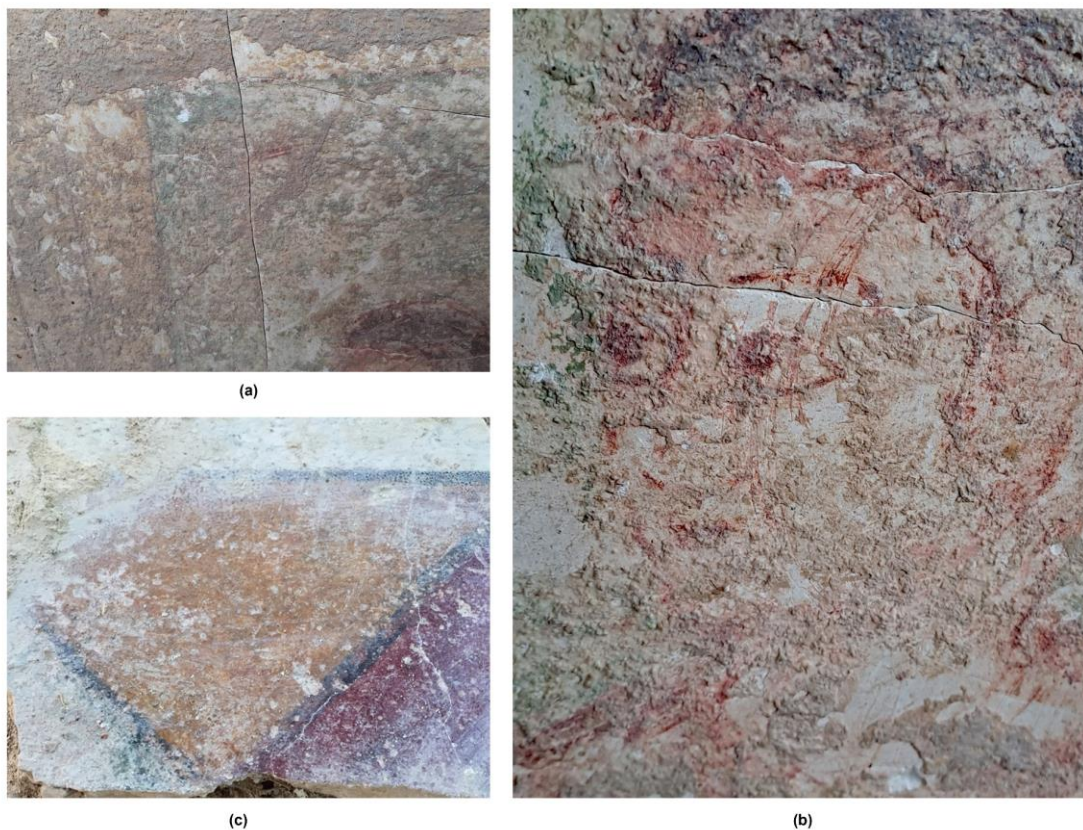
**Figure S14.** Sample FP1, cross-section: (a) SEM micrograph and (b) EDS microanalysis of Fe-based particle in the red paint.



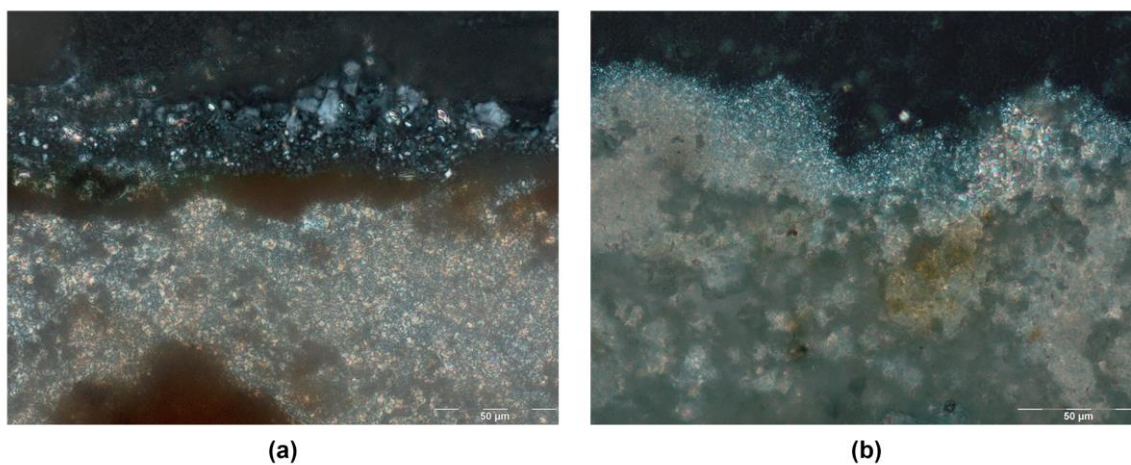
**Figure S15.** SIM chromatograms the amino acid fraction of samples from the floor\*.

\*I.S. internal standard of derivatisation (Norleucine). ala=alanine; gly=glycine; val =valine; leu=leucine; ile=isoleucine; pro=proline; ser=serine; phe=phenylalanine; asp= aspartic acid; glu= glutammic acid.

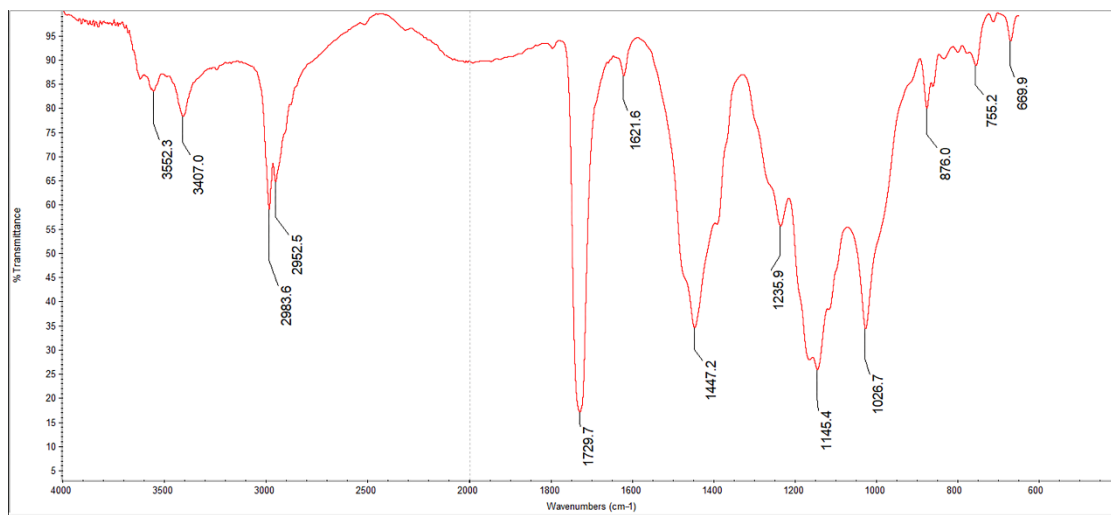




**Figure S16.** (a) Fractures, soil residues and encrustations are visible on the wall painting surface; (b) red sinopia; (c) Abrasions, fractures and paint detachments on the painted floor, detail.



**Figure S17.** PLM micrographs of the thin section of calcium carbonate and gypsum encrustation: (a) sample A1a (b) sample A2.



**Figure S18.** micro-FTIR spectrum: acrylic resin in the wall painting.