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Preliminary multi-analytical investigation of Late Etruscan ceramics from Pyrgi (Latium, Central Italy): insights into production processes and decorative technologies

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This study presents preliminary results from a multi-analytical investigation of ceramic fragments recovered from a 4th-century BCE votive deposit at Pyrgi (Central Italy). The research aims to reconstruct production processes, with a focus on the compositional and microstructural features of decorative layers displaying diverse polychromies and motifs. An integrated analytical approach was adopted, combining petrographic microscopy (OM), quantitative grain-size analysis (ImageJ), XRPD, SEM-EDS, colourimetry, micro-Raman spectroscopy, and electrochemical impedance spectroscopy (EIS) with Mott-Schottky analysis. Petrographic and grain-size data reveal a homogeneous, fine-grained texture across all samples, with well-sorted silt-sized inclusions, indicating standardized raw material selection and processing. XRPD identified quartz, alkali feldspars, plagioclase, and clinopyroxene in the ceramic bodies, consistent with the local volcanic-sedimentary geological setting and firing conditions [1]. The presence of hematite confirms an oxidising firing atmosphere for the ceramic bodies. Gloss coatings consist of refined, highly sintered clayey suspensions enriched in Fe- and K-oxides, the latter likely acting as a fluxing agent. These coatings were subjected to oxidizing or reducing conditions, as demonstrated by the presence of hematite in the red glosses, and of magnetite and charcoal in black glosses, respectively (Fig. 1). Red and black overpainted motifs were produced using hematite- or carbon-based pigments applied over the gloss layer. Variations in the composition and thickness of the coating, as well as in electrochemical surface response, do not reflect different production centers, but rather stylistic variants within a shared technological tradition. These preliminary results highlight the importance of integrated geochemical, mineralogical, and microstructural approaches for reconstructing ceramic production practices and workshop organization in late Etruscan contexts.

References

[1] Borgers, B. et al. (2023). Archaeological and Anthropological Sciences, 15, 180

Figure 1

Micro-Raman analysis of samples PYC1a, PYC2, PYC6, and PYC8. The ceramic fragments are shown with the analyzed locations (red arrows).

