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From deposits to social practices: Integrated micromorphological analysis of floor sequences at Middle Bronze Age Erimi-*Laonin tou Porakou*, Cyprus☆

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ABSTRACT

Floors are a key data-set of cultural evidence in archaeological contexts as they offer potential for detecting and interpreting the spatial conventions through which economic and social relationships are represented and negotiated during the life-history of buildings and settlements. In this study, floor sequences from the Middle Bronze Age site of Erimi-*Laonin tou Porakou* (c. 1950–1650 BCE) have been analysed through an interdisciplinary approach based on integration of stratigraphic, micromorphological, spectroscopic (FTIR) and geochemical (XRF) analyses. This integrated approach is aimed at examining materials and technology in floor plaster manufacture as well as the impact of environment and activities on floor surfaces as indicators of continuity and change in use of space and related socio-cultural and economic implications. The multi-scalar data-set provided an effective framework with which to reconstruct every-day practices in the construction, use and maintenance of floor plasters within buildings. In particular, data analysed has permitted identification of the occurrence of specific recipes in floor plaster manufacture that suggest organisation of labour and production possibly at supra-household level. However, no clear evidence of pyrotechnological plasters has been recognised on the basis of data examined. Spatial and temporal changes in floor sequences reveal that floor plastering episodes represented important markers of building renovation during the life history of Erimi-*Laonin tou Porakou*. Instances were documented of the introduction of layers of new floor plaster types that corresponded to changes in activities within building, from dirtier to cleaner, and to enhancement of spatial and architectural elaboration of built space. The integrated micromorphological analysis applied to floor plaster sequences has provided new insights into the dynamic scenario of social organisation at Erimi-*Loanin tou Porakou*, contributing to delineation of a range of potential avenues for studying socio-cultural trajectories and evolutionary pathways of Bronze Age communities in Cyprus.

1. Introduction

Ethnoarchaeological and geoarchaeological approaches to household studies (e.g. Boivin, 2000; Karkanas and Efstratiou, 2009; Kramer, 1979; Matthews, 2005b; Matthews et al., 1997; Milek, 2012; Schiffer, 1987) have demonstrated that deposits, surfaces and micro-materials are powerful media through which social relationships are expressed and materialised (De Marrais et al., 1996; Hendon, 2004, 276) and embody socio-cultural and political settings, boundary and events within buildings and the life histories of the individuals, household and communities associated with them (La Motta and Schiffer, 1999; Matthews, 2005a). It has been argued that different surfaces within a building may be selected to express the hierarchy of space and community relationships (Asatekin, 2005, 389; Matthews et al., 2013, 115). In fact, the analysis of floors, surfaces and occupation deposits offers potential for detecting and interpreting the spatial conventions through which economic and social relationships are represented and negotiated during the life-history of communities and settlements (Matthews and French, 2005, 325; Parker Pearson and Richards, 1994).

Over the past decades the application of micromorphological and microstratigraphic approaches in archaeological contexts, has greatly contributed to enhance the analysis of use of space and the interpretation of individual and community practices by examination of traces of surfaces and activities at high-resolution timescales (e.g. Boivin, 2000; Matthews, 2005a, b; Matthews et al., 1997). Micromorphology's principal contribution is that it enables simultaneous high-resolution analysis of the microscopic properties of sediments, artefactual and bioarchaeological remains, within their precise depositional and post-depositional contexts in floors and occupation deposits, which are critical sources of sociocultural and environmental

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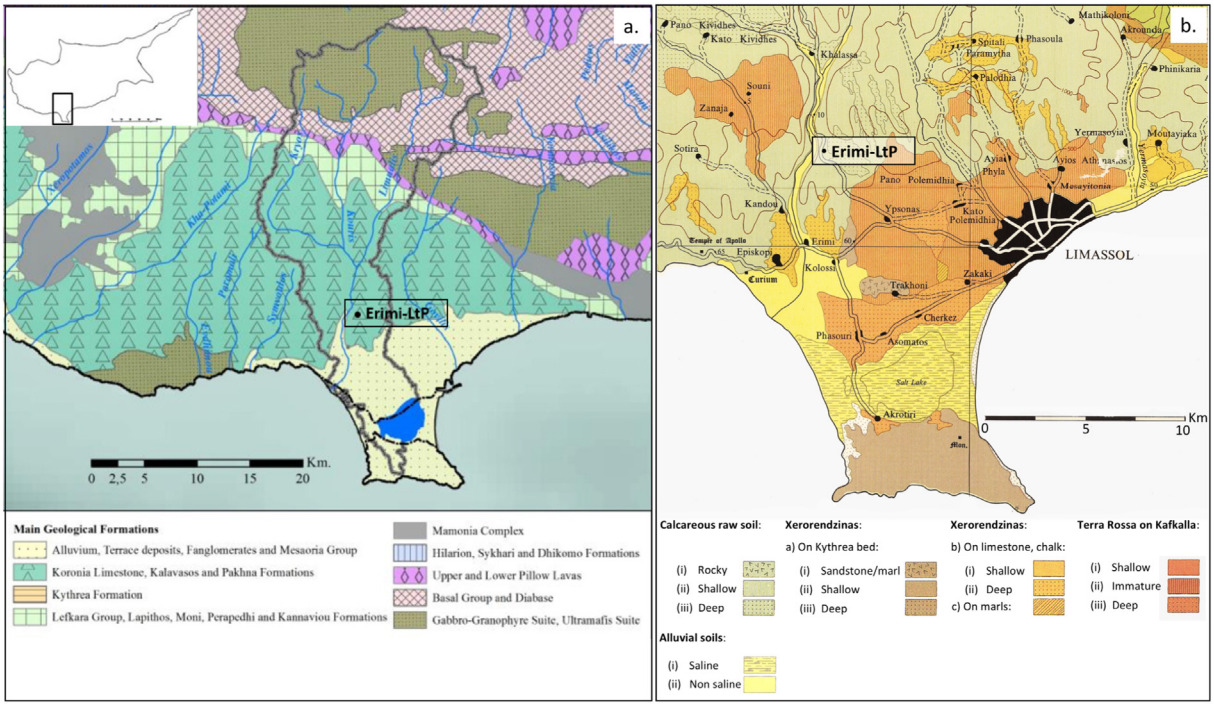

Fig. 1. a) Geological Map of the Kouris valley region indicating the position of Erimi-*Laonin tou Porakou* (after Scirè-Calabrisotto et al., 2017a). The site is located in the sedimentary complex of Miocene Pachna formation (green triangles); b) Soil Map of the Kouris Valley region, showing the site area characterised by alluvial and calcareous soil types (European Soil data Centre https://esdac.jrc.ec.europa.eu/content/general-soil-map-map-cyprus). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

information (Matthews, 2005b, 356).

In this study, micromorphology is incorporated into a well-integrated interdisciplinary research programme, in order to examine and compare results and interpretations from stratigraphic sequence of field deposits with those from microscopic and geochemical analyses of microstratigraphic sequences. Micromorphology is coupled with FTIR and XRF analyses, as high-resolution analytical tools to examine floor-plaster sequences within buildings, and to analyse materials and technology in floor-plaster manufacture and identify spatial and temporal variation in use and concept of space at the Middle Bronze Age Cypriot settlement of Erimi-*Laonin tou Porakou*. The integration of higher resolution analyses with macro-stratigraphic analysis in the field provides an efficient analytic tool to address some of the sampling limitations of micro-analyses by linking the results with larger scale field-observations (Amadio, 2017a; Bombardieri, 2017a, b). This approach enables greater evaluation of the strengths and weakness of each data-set, the different temporal resolutions that they represent and the potential for integrating and combining them in interdisciplinary multi-scalar analyses of the micro-histories of early settlements in Cyprus.

Despite the long-established application of integrated micromorphological analysis in the study of Prehistoric and Protohistoric Near-Eastern and Aegean contexts (e.g. Matthews, 1995, 2000, 2012; Karkanas and Efstratiou, 2009; Karkanas and Van de Moortel, 2014; Shahack-Gross et al., 2005) the use of this analytical approach in the study of Cypriot settlements is still limited. The French expedition at the Pre-Pottery Neolithic site of Klimonas is producing interesting data about formation processes and use of space at this site by combining standard field examinations with micromorphological analysis (Mylona et al., 2017; Mylona, 2018; Vigne et al., 2011); however, the results await final publications. Micromphological analyses have been also conducted at the Chalcolithic site of Souskiou-*Laona* (Dalton, in press; Peltenburg, 2011; Peltenburg et al., 2006) and the main publication of the site is in preparation. Micromorphology has been also applied at the Late Bronze Age rural site of Arediou-*Vouppes* (Steel, 2016; Steel and McCartney, 2008; Steel and Thomas, 2008) to respond to specific questions concerning formation processes and architectural material provenance (Macphail, 2008). Given the limited availability of micromorphological data in Cyprus, one of the purposes of the application of integrated micromorphological analysis at Middle Bronze Age Erimi-*Laonin tou Porakou* is to create a reference data-set of components and deposit-types as well as of pedofeatures and post-depositional processes that may be used as comparative materials for possible future micromorphological applications in the analysis of other Cypriot contexts.

The methodological framework applied in this study is aimed at generating an interdisciplinary data-set with which to analyse the study context at different spatial and temporal scales in order to investigate the socio-cultural and economic transformations at Erimi-*Laonin tou Porakou* during Middle Bronze Age Cyprus by analysis of:

- source materials, properties and technologies in the manufacture of floors as indicators of ecology and material engagement, labour organisation and technological specialisation;
- impact of environment, activities and events on floor surfaces as indicators of continuity and change in use of space.

The overall aim is to provide new, significant evidence in the analysis of Middle Bronze Age Cyprus, as this represents a crucial period for studying the social dynamics which contributed to define the passage from a village-based organisation to an urban, multi-cultural society. In fact, Bronze Age Cyprus (ca. 2500–1050 BCE) marks a clear break with the previous period of Cypriot prehistory. This is evident in the appearance of renovated forms of material culture and in the social and economic changes associated with household and community structure, labour organisation, intensification and specialisation of production and exchange (e.g. Knapp, 2013a, b). Transformations in the nature of Cypriot society became more evident during the Middle Cypriot period (ca. 1950–1650 BCE) and especially during its latest phase. New social identities, roles and relationships were formed, gradually transforming the household-based society of Chalcolithic and Early Bronze Age Cypriot communities into a more complex social system that is typical of

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