



Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

journal homepage: www.elsevier.com/locate/jasrep

Clay preparation and function of the first ceramics in north-west Anatolia: A case study from Neolithic Barcın Höyük

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ARTICLE INFO

Keywords:

Neolithic pottery
Anatolia
Petrography
Technology
Innovations
Function

ABSTRACT

This article investigates the process of Neolithisation of the eastern Marmara region of north-west Anatolia by discussing the results of a pilot study to define the development of the clay preparation methods of the first ceramics at Barcın Höyük. We used petrographic analysis on a sample of sherds ($n = 34$) from Neolithic levels (c. 6600–6200 cal. BC) at the site, and compared our findings with the ceramic technology of Neolithic settlements in neighbouring regions. The results suggested that the composition of the clays used changed over time, moving from the use of heterogeneous metamorphic clays in the first phase of the settlement, to the extensive use of crushed calcite temper in later phases. The development in clay recipes may have involved changes in the strength, toughness and thermal behaviour of the ceramic vessels when used for cooking or boiling over fire. Although the development of cooking ware is seen in Central Anatolia at about the same time as the beginning of the settlement at Barcın Höyük, the use of crushed calcite temper may be specific to the eastern Marmara region and adjacent inland areas. The use of crushed calcite temper may therefore represent a local innovation, although future petrographic studies of early ceramics in Anatolia are necessary to support this interpretation.

1. Introduction

The Neolithisation of south-eastern Europe can be viewed as a heterogeneous process that emerged from the interplay between migrating groups of people, spreading and developing material cultural styles and technologies, and the adaptation of Neolithic life-ways and domesticated plants and animals, resulting in a ‘mosaic’ of material cultural assemblages (e.g. Arbuckle et al., 2014; Conolly et al., 2011; Coward et al., 2008; Horejs et al., 2015; Özdoğan, 2011, 2015; Scheu et al., 2015; Tringham, 2000; Whittle, 1996). Since the discovery of Neolithic settlements in western Anatolia, it has transpired that there are regional differences in “typological variants of tools and non-utilitarian objects, technological features, architectural employments, organization of settlements, and subsistence patterns” (Özdoğan, 2011, 29). This heterogeneity in the use of elements of the ‘Neolithic package’ in southeastern Europe and western Anatolia (e.g. Çilingiroğlu, 2005) has been variously interpreted as the result of ethnic diversity among the first farming groups (e.g. Todorova, 2007), the influence of indigenous hunter-gatherer communities (e.g. Özdoğan, 2011; Pavúk, 2007) and different dispersal routes from the core area of farming expansion (e.g. Horejs et al., 2015). However, the extent to which the

innovative behaviour of the first westward moving farmers has contributed to the observed heterogeneity in the archaeological record has been less frequently discussed.

This article will focus on the adoption of new ideas and technologies during the Neolithisation of north-west Anatolia by addressing the clay preparation methods and functional properties of the earliest pottery assemblages from Barcın Höyük, the earliest Neolithic settlement known in the eastern Marmara region of Anatolia to date (Fig. 1). Barcın Höyük is commonly considered to have been founded by a community of pioneer migrants (Gerritsen et al., 2013b), who may have moved into the eastern Marmara region from an unidentified core area or from an intermediary settlement that had originated in this core area. The observed conceptual similarities between the pottery assemblages of Barcın Höyük and Çatalhöyük in Central Anatolia, especially in the second half of the seventh millennium BC (Gerritsen et al., 2013b, 73–74), have often been regarded in the context of an overland expansion model, which has also been proposed for Ulucak on the Aegean coast of Anatolia (Çilingiroğlu and Çakırlar, 2013; Horejs et al., 2015). However, both the architectural style and the composition of the faunal packages differ between these regions, challenging the interpretation of similarities between the pottery assemblages.

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<http://dx.doi.org/10.1016/j.jasrep.2017.06.028>

Received 13 July 2016; Received in revised form 25 January 2017; Accepted 16 June 2017
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Fig. 1. Location of Barcın Höyük and neighbouring sites with Neolithic occupation phases.

This article investigates the development of the clay preparation methods in phases VIe, VI d1, VI d2 and VI c at Barcın Höyük, and discusses these developments by focusing on the performance characteristics of the non-plastic inclusions in their fabrics, and comparing these to contemporary clay recipes from Central Anatolia. The combination of raw materials that creates a clay paste, also referred to as the recipe, allows potters to control the functional properties and workability of the clay, resulting in the desired end-product (Quinn, 2013, 156). Apart from having a functional role, the use of certain tempers may be specific to ceramic traditions without a clear functional advantage (e.g. Gosselain, 1992). Instead of providing a clear adaptive advantage, clay recipes may instead reflect an ‘isochrestic’ choice (Sackett, 1986), part of the technological repertoire of a social group. Technological behaviour, understood here as “integrated webs weaving skill, knowledge, dexterity, values, functional needs and goals, attitudes, traditions, power relations, material constraints, and end-products together with the agency, artifice, and social relations of technicians” (Dobres, 1999, 128), is, with regards specifically to ceramics, usually transmitted during extended periods of training and observation (Dietler and Herbich, 1994; Gosselain, 1992; Wallaert-Pître, 2001). Clay preparation, as one of the initial steps in the chaîne opératoire of ceramic production, may therefore represent the ‘technological style’ (Dobres, 1999; Hegmon et al., 2000; Lemonnier, 1993; Leroi-Gourhan, 1943) of a social group.

Furthermore, although ideas in relation to clay preparation methods can be transmitted between peers during post-learning interactions, they may play a different role in the production sequence than the “technically malleable, highly visible” (Gokey, 2014) aspects of ceramics. In contrast to pottery styles, which, because they are “likely to be ascribed aesthetic, economic, or symbolic values”, may be “consciously borrowed and manipulated” (Gokey, 2014; Gosselain, 1992, 191), the relative invisibility of clay preparation methods in the end-product ensures that transmissions are likely to occur among a more restricted group of individuals, integrated in local or regional learning networks (Gosselain, 2000, 192). Therefore, a detailed understanding of the distribution of technological habits and skills relating to the clay preparation carried out by the earliest potters in Anatolia can provide a counterpoint to arguments about the relationship between sites made on the basis of stylistic or functional similarities alone. Contributing to the emerging body of work on Neolithic ceramic technology in Anatolia, we reflect on the probable relationships between Central Anatolian ceramic technology and the production methods of the first farmers in eastern Marmara. We also discuss the changes in the raw materials used for making the ceramics to try and understand whether it is likely that they were inspired by a functional advantage in relation to the strength, toughness and thermal behaviour of the pottery vessels.

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