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Pottery production and distribution in prehistoric Bronze Age Cyprus. An application of pXRF analysis

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ABSTRACT

Portable X-ray Fluorescence (pXRF) analysis of over 400 samples of Early and Middle Bronze Age Cypriot pottery from four widely separated sites identifies both local and non-local products at each. A series of analyses of sub-sets of the data highlights differences in the clays used at each site and for some distinctive types and wares. When assessed in the context of general typological, technological and stylistic factors these variations provide the basis for considering patterns of local production and inter-regional relationships across the island. Although the great majority of pots were locally made, particular wares and shapes were brought in from elsewhere. For some sites finer, more highly decorated vessels are mostly imports, but at others both simpler and more complex vessels were made of the same local clays. While small juglets or flasks may have been containers for transporting small quantities of rare substances, larger vessels are likely to have held less precious material. Open vessels, especially small bowls – some of which are plain, utilitarian items – represent another aspect of social behaviour and inter-regional relationships.

1. Introduction

1.1. Context

The Bronze Age cultural system in Cyprus was initiated by a movement of people to the island in the late 3rd millennium BC. For the first few generations (the Philia phase of the Early Bronze Age) it was characterised by a uniformity of material culture indicating close connections between different parts of the island (Webb and Frankel, 1999). The social and economic networks involved the distribution of pottery of very similar fabrics and shapes from the north to other areas of the island (Dikomitou, 2010) and of copper from production areas in the foothills of the Troodos Range to sites on the north coast which were in turn linked into a broader eastern Mediterranean interaction sphere (Webb et al., 2006). By about 2200, during the succeeding Early Cypriot I–II period (hereafter EC I–II), this cohesive system broke down, perhaps because of a general collapse of the overseas economic systems and a reduced external demand for copper. In place of earlier ceramic uniformity regional technological and aesthetic styles developed, with increased local pottery production. During Early Cypriot III (EC III) and the first part of the Middle Cypriot Bronze Age (MC I–II) (about 2100–1800 BC) different patterns of social interaction emerged (papers in Hein, 2009) which can be traced by both general stylistic analyses and by the movement of small quantities of particular wares (e.g. Dikomitou, 2007). Copper is likely to have remained a key commodity in establishing and maintaining these connections. The degree of variability in site-types and material culture across the island is slowly beginning to emerge with increased evidence from new, or newly published, sites. The four sites used here represent some of this variability (Fig. 1).

Local or regional production of pottery during this period can be argued for on general archaeological grounds, including inter-site differences in utilitarian vessels, technological and decorative styles, specific evidence of pottery manufacture (e.g. tools and wasters) and analyses of clays. While some more comprehensive studies of Cypriot ceramics integrate several approaches (e.g. Dikomitou, 2007, 2010), portable X-ray Fluorescence (pXRF) has also been employed (e.g. Mantzourani and Liritzis, 2006). In a previous study of Early Bronze Age pottery using pXRF we were able to differentiate clays which matched general models of regional style zones and the movement of specific items (Eccleston et al., 2011). In this paper we build on that initial work to explore these and related issues further. We have again exploited the well-known advantages of pXRF to analyse large samples in order to more clearly demonstrate which types of pottery were brought in to the sites. Our primary aim is not to locate specific sources or production centres but to identify the extent and nature of non-local pottery in contexts where most vessels were locally produced.

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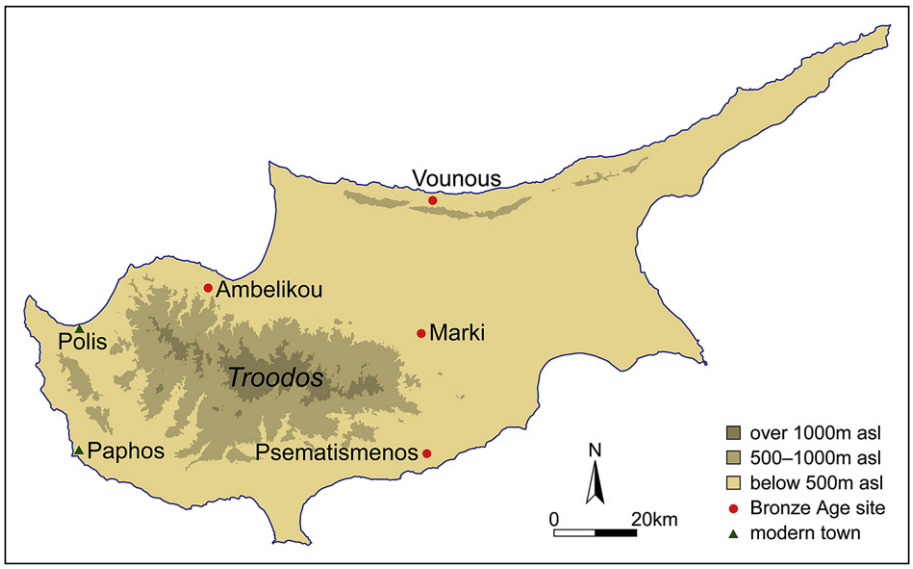

Fig. 1. Map of Cyprus showing archaeological sites and other places mentioned in the text.

1.2. Pottery wares and types

1.2.1. Red Polished ware

The broad tradition of Red Polished (hereafter RP) ware is characteristic of EC and MC sites in most parts of Cyprus. A general chronological evolution can be defined, which follows the broad groupings into RP I to RP IV defined 50 years ago by Stewart (1962). It is, however, becoming increasingly clear that there were significant regional and local variations in both form and techniques of production. The history, nature and extent of these differences are an important focus of research. During EC I–II, for example, RP from the central lowlands and south coast developed along different lines from that of the north. In the former areas a hard, gritty fabric was produced, with a characteristic surface appearance with deliberate (although unpredictable) mottled effects (Frankel and Webb, 2006: 104–105; Georgiou et al., 2011: 280–288). Fine incised decoration was rarely used. On the north coast vessels were made of softer clays with fewer inclusions, well suited to the fine incision which was the preferred mode of decoration (Stewart and Stewart, 1950). As well as chronological and regional differences, the quality of fabrics and surface treatment within the RP tradition also vary from one functional form to another. Although larger vessels may have had some simple incised decoration, finer and more complex patterns are generally only found on juglets, flasks and small bowls made of finer (often more calcareous) clays. In the northern areas, in particular, small bowls were also commonly fired black on the interior and on the upper exterior surface.

In the analyses presented below the RP material is divided into several sub-sets:

RP I–II: Earlier forms of RP with softer, finer fabric and a red-slipped well burnished surface, generally best known from sites on the central north coast.
RPm I–II: Earlier forms of RP with a harder, grittier fabric and distinctive, deliberately produced black patches or mottling of the surface, characteristic of the central and southern areas of the island.
RP III: Later forms of RP dated to EC III and MC I–II and found in most areas.
RP III (black top): Smaller vessels, primarily bowls, with a lustrous black interior which extends over the rim to the exterior, with oxidised red lower exterior body.
RP III (black top, fine incised): Similar to RP III (black top) but with finely incised decoration.
RP III (fine incised): Generally smaller vessels differentiated from other RP vessels by the use of finely incised decoration.
Pithos: RP III very large storage jars.
Cooking pot: A variety of RP III with a characteristic shape and fabric, used as a cooking vessel.

1.2.2. Drab Polished ware

Drab Polished ware (hereafter DP) is less well known than the more widespread and abundant RP. It is the most common EC and MC ware in western Cyprus but is found in small quantities elsewhere. DP is characterised by a fine, hard, orange-brown fabric, often with a distinctive blue core, and an orange-brown surface with relatively simple incised, impressed or relief decoration. The shapes differ from those of most RP vessels and previous analyses have also noted the distinctive nature of its clays (Summerhayes et al., 1996: 179; cf Knapp and Cherry, 1994: 77–78).

1.2.3. Devices

Within a general category of 'devices' we include spindle whorls, hobs, Coarse ware mealing bins or basins, mudbricks, a bellow's nozzle and similar items. While there is every reason to assume that hobs (semicircular hearth-surrounds or pot-stands), mudbricks and mealing bins were locally made, this need not have been the case with whorls. Although whorls can often be classified within ceramic ware types, their context of production may have been significantly different and they may have moved between villages with their (probably female) owners, particularly in patrilocal marriage systems.

1.3. The sites and samples

The short-lived settlement at Ambelikou-Aletri, occupied during the first phase of the Middle Bronze Age, provides an ideal starting point for this investigation, not least because it has provided evidence for on-site pottery production. Although best known for some 70 years as a copper-mining site (Merrillees, 1984), the finds include more than four dozen complete jugs of very similar shape and several wasters from the catastrophic abandonment of a pottery workshop (Dikaios, 1945, 1946). These jugs and wasters — and by extension other vessels of similar fabric — were obviously made at the site. However, other pottery differs significantly in shape,