Journal of Archaeological Science: Reports 18 (2018) 984–999

Contents lists available at ScienceDirect

Journal of Archaeological Science: Reports

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

Clay combustion structures in early Mesolithic at Cova da Baleia (Mafra, Portugal): Approaches to their functionality

Ana Catarina Sousa[a,*], Juan Gibaja Bao[b], Niccolo Mazzuco[d], Marta Miranda[c], João Pedro Vicente Tereso[a,e], Cláudia Oliveira[e], Victor S. Gonçalves[a]

[a] UNIARQ, Center for Archaeology of the Lisbon University, Faculty of Letters, University of Lisbon, Alameda da Universidade, 1600-214 Lisboa, Portugal
[b] Institución Milà i Fontanals (MF-CSIC), C/Egipcíaques 15, Barcelona, 08001, Spain
[c] Câmara Municipal de Mafra, Praça do Municipio, 2640 Mafra, Portugal
[d] UMR 7055 'Préhistoire et Technologie', CNRS-Université Paris Ouest Nanterre la Défense, 21 Allée de l'Université, F-92023 Nanterre Cedex, France
[e] InBIO - Rede de Investigação em Biodiversidade e Biologia Evolutiva, Lab. Associado/CIBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos, Univ. Porto. Uniarq - Centro de Arqueologia da Universidade de Lisboa, Portugal

ARTICLE INFO

Keywords:
Mesolithic
clay structures
fire
Portugal

ABSTRACT

The functionality of Cova da Baleia (Mafra, Portugal) is hereby presented and discussed in this paper. In an excavated area of 500 m^2 was identified a large concentration of structures (128), of which 104 were in clay, with two phases of occupation. The absolute chronology indicates a majority occupation of the second half of the 8th millennium cal BCE (Early Mesolithic) and a second phase towards the end of the 7th millennium (Late Mesolithic). Despite the excellent state of conservation of the site, the osteological remains are practically absent, possibly due to taphonomic factors.

Cova da Baleia is clearly a distinctive site of the reference framework known of the Early Mesolithic times in Portugal, given the large size of the site (about 1 ha) and its structural complexity.

It was clear that an interdisciplinary approach was mandatory in order to fully guarantee the site interpretation, namely regarding its functionality. The results of the use-wear and archaeobotanical studies show the relevance of wood and other hard materials, whereas the need for fire for these activities remains to be understood.

1. Introduction

Today there are still only a few archaeological sites from the Early Mesolithic (Pre-Boreal and Boreal – 8200-6200 cal BCE) in Portugal (Fig. 1). They're mostly concentrated in Estremadura, integrating three functional categories: 1. shell middens; 2. terrestrial open-air sites; 3. shelters and caves (Araújo, 2011). These three types occur in distinct geographic areas: the shell middens, on the Atlantic coast; the open-air sites and caves in the Estremadura Limestone Massif. The available information is fragmented, with excavations of reduced and unequal context preservation. The shell middens constitute the more frequent and most intensely researched sites. The terrestrial open-air sites are very scarce, which can be explained by their difficult detection.

Given this scenario, was proposed a model that advocates high levels of mobility in Estremadura (Araújo et al., 2014, p. 32), with logistic sites (shell middens and shelters) and residential sites, in lower areas. Until now, the only identified sites that might be residential have been found in the region of Rio Maior: Cabeço de Porto Marinho 5 (Zilhão, 1997), Areeiro 3 (Bicho, 2000) and Fonte Pinheiro (Bicho, 1994).

Therefore, the site at Cova da Baleia assumes great importance. Within the framework of preventive archaeology, the 2007 excavation allowed the identification of a new site typology with a high number of clay structures, completely different from those known until then for the Early Mesolithic in Estremadura (Sousa and Gonçalves, 2015).

Sites with numerous clay structures, concentrated in nuclei, were identified in the South of Portugal, namely in the area of Baixa do Xarez, where the interventions in Xarez 12 and Carraça 1 (Gonçalves, 2003; Gonçalves et al., 2008; Gonçalves et al., 2013) took place. Subsequent interventions were later carried out in other contexts in the area of Évora (Gaspar et al., 2009; Santos and Carvalho, 2008). Radiocarbon dating was not possible in any of these sites, but the material culture seems to indicate a chronology of the Late Mesolithic and Early Neolithic.

The present paper seeks to distinguish the functionality of Cova da Baleia based on structures, materials and absolute chronologies, using use-wear analysis and anthracology as supplementary tools.

* Corresponding author.
E-mail address: sousa@campus.ul.pt (A.C. Sousa).

https://doi.org/10.1016/j.jasrep.2017.10.049
Received 2 August 2017; Received in revised form 26 October 2017; Accepted 31 October 2017
Available online 23 November 2017

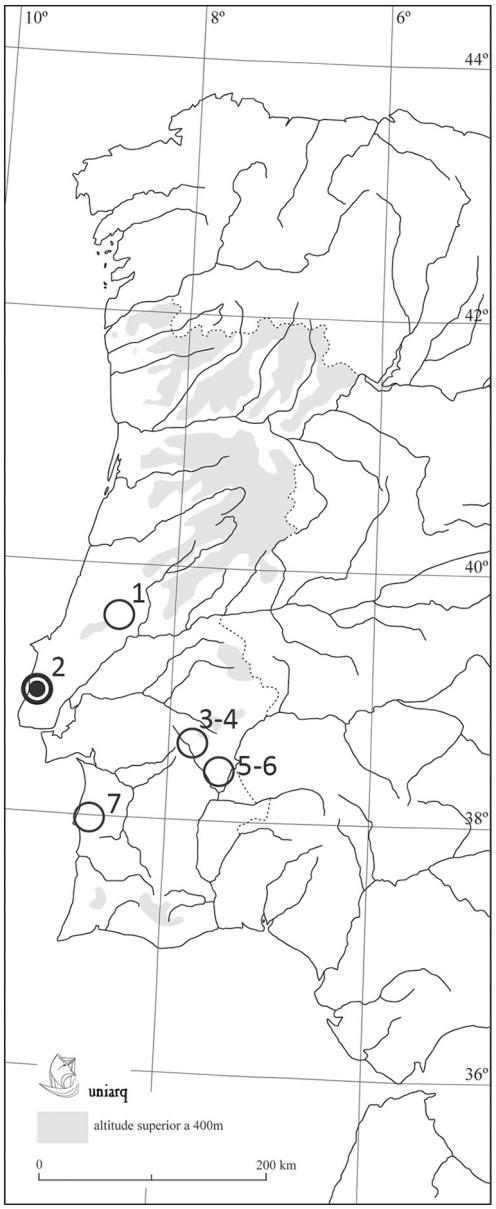

Fig. 1. Location of Cova da Baleia and other contexts with clay combustion structures in central and southern Portugal: 1-Fonte; 2-Cova da Baleia; 3-Defesa de Cima; 4-Lajinha 8; 5-Carraça 1; 6-Xarez 12; 7 – Salema.

2. Cova da Baleia: the data

The archaeological work in Cova da Baleia was part of a preventive archaeological intervention performed in 2007, with a total excavated area of 500 m^2. The prehistoric occupation is located on a soft slope (170–150 m), covering an area of about 1 ha in two contiguous valleys (Figs. 2, 3).

Cova da Baleia is located in the Lisbon Peninsula, in the county of Mafra, at 9°20′311″ latitude; 38°58′434″ longitude (geographic coordinates) and − 104,271,666 (X), − 76,275,678 (Y), 170 m (Z) (Gauss coordinates; *Datum* Lisboa).

The site is on the left bank of the Ribeira do Cuco tributary, a stream that drains into the Atlantic Ocean. Presently, Cova da Baleia is located about 9 km from the ocean, but the coastline may have been further inland during the prehistoric occupation of the location (Dias, 2004).

2.1. Stratigraphy

The occupation of Cova da Baleia is situated on a gentle slope (ranging from 170 to 150 m), with an occupied area of about 1 ha. Its implantation in a slope would have potentiated the deposition of colluvium, with a thick stratigraphic deposition, following the slope.

In an area of intense agricultural work, the conservation of the Cova da Baleia contexts was only possible due to the existence of very specific depositional circumstances: a recent water line that possibly prevented the use of agricultural machinery in the adjacent area.

The water line (S.U. 3) created a deep trench, which cut many archaeological contexts (clay combustion structures and other structures (see Fig. 4). The orientation of this trench follows the North-South direction, positioned at the juncture of coordinates 8 and 9. The width of this trench is variable, on average it registers 0.3 m wide, although in some sections it can reach 1 m. The depth of this trench is also variable, accompanying the slope, which affects more deeply the structures were preserved in lower slope (see Fig. 5).

The excavation uncovered a number of archaeological vestiges including 128 structures, of which 104 correspond to burnt clay structures, with distinct typologies (Fig. 4).

Three large sedimentary horizons were identified (Figs. 6, 7):

1. Superficial humus layer, mechanically excavated during land clearance (U.E. 0).
2. Very compact deposit (U.E. 1), with a thickness varying between 2 m and 0.5 m, along the slope. The sediment presents scarce archaeological materials and reduced stone blocks, as well as some mid-level structures. This extremely homogeneous deposit resulting from a process of pedogenesis may include several phases of the occupation.
3. Palaeosol (U.E. 7), from which a very high number of clay structures (73) and pits (Bicho, 1994) were excavated, corresponding to 80% of the identified structures. The structures were organized in nuclei, possibly corresponding to a horizontal stratigraphy.

The conjugation of stratigraphic data, positioning of structures and dating materials seems to indicate the existence of the following stages of occupation, from the oldest to the most recent (Fig. 8):

Phase 1: occupation of the slope and successive construction of structures upon the palaeosol. Integrates all the clay oven-type structures, pits and stone pavements, associated with an occupation layer containing a considerable number of archaeological materials;

Phase 2: occupation of the slope, with the presence of clay structures (thermal slabs), stone pavements and postholes;

Phase 3: A burial deposit (NMI 2 and 52 theet);

Phase 4: Recent rural use of the soil.

2.2. Features

Generically, three main types of structures can be identified: 1) clay structures; 2) stone structures; 3) pits (Table 1).

2.2.1. Clay structures (1)

The structures that integrate burnt clay correspond to the most numerous group (total of 104), highlighting the importance of this resource for the construction of structures during the full diachrony of occupation. Two different types of structure were identified.

- Clay pits or kilns (1.1.), excavated in the palaeosol and with signs of combustion (abundant charcoal, stone thermal slabs or thermally altered stones). Most of the structures (58%) were excavated, while the remaining structures were only defined at the surface. They present subcircular or oval shapes, with different typologies: domed (1.1.1), tronco-conical (1.1.2), and structures that integrate a clay-stone mixture (1.13). Their state of conservation was excellent,