



Fuel uses in Cabeço da Amoreira shellmidden: An insight from charcoal analyses



Patrícia Diogo Monteiro ^{a,*}, Lydia Zapata ^b, Nuno Bicho ^a

^a Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, FCHS, Universidade do Algarve, Campus de Gambelas, 8005-139 Faro, Portugal

^b Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain

ARTICLE INFO

Article history:
Available online 10 February 2016

Keywords:
Wood charcoal
Fuelwood
Mesolithic
Cabeço da Amoreira
Portugal
Pinus

ABSTRACT

Wood charcoal is an important tool for inferring human use of fire and exploitation of woodland resources. Using Cabeço da Amoreira shellmidden as study case, this paper aims to understand fuelwood use in the site, identifying patterns of wood exploitation and combustion related to different activities. Pine wood and presence of oak are the most common and are present in almost every context. Minor taxa is present, but the relation with specific activities in the site is not conclusive. However, data seem to indicate a usage of deadwood and exploitation of the most abundant taxa in the Muge valley.

© 2016 Elsevier Ltd and INQUA. All rights reserved.

1. Introduction

The use of fire could be considered one of the main technologies developed by humans. Fire had a profound impact on the development of human cognition, economy and society (Wrangham, 2009; Roebroeks and Villa, 2011). Fire technology has been an important research field to understand human evolution and complexity of past societies (Théry-Parisot, 2002a; Corty et al., 2012; Mentzer, 2014; Mallol et al., 2013; Stahlschmidt et al., 2015). The management of fire is linked to the management of woodland resources by the hunters and gatherers (Caruso et al., 2013) but also with its use, control and production as an indicator of human complexity and technological achievements (Courty et al., 2012; Mentzer, 2014; Shahack-Gross et al., 2014; Stahlschmidt et al., 2015).

The relationship between human societies and their environment is an important issue for understanding their economy and exploitation of wild resources. During Mesolithic this is particularly important for understanding the transition between the mobile hunter and gatherers to the sedentary agricultural societies and the impact that climatic events and environmental changes during

these cultural transitions (Price, 1987; Champion et al., 2009; Straus, 2009; Gutierrez-Zugasti et al., 2011).

A charcoal analysis allows the identification of species used for fire and is an important tool to achieve insights both on past vegetation and human behaviour (Vernet, 1976; Chabal, 1992; Zapata and Figueiral, 2003).

Here we present anthracological data from a Portuguese Mesolithic site, Cabeço da Amoreira that integrates the Muge shellmiddens complex. Cabeço da Amoreira is a shellmidden from the Atlantic façade and one of the main references for Portuguese Mesolithic (Figs. 1 and 2). New investigations and excavation on the site have provided the identification of horizons of occupation in the settlement as well as different structures (human burials and hearths) that might indicate specific activities within the site. The current investigation project in the site intends to solve some problems and questions concerning stratigraphy, chronology (Table 1), human burials and recovery of faunal and botanical remains. Charcoal here presented came from recently excavated and dated contexts (Umbelino, 2006; Detry, 2007; Bicho et al., 2010, 2011, 2012; Figueiredo, 2012; Monteiro, 2012).

The presentation and discussion of charcoal analyses of samples recovered from several horizons and contexts of Cabeço da Amoreira aim to understand the pattern use of fuel in the site and the firewood practices within the site during its occupation and on different activities and the relationship of humans with Muge landscape.

* Corresponding author. Interdisciplinary Center for Archaeology and Evolution of Human Behaviour, FCHS, Universidade do Algarve, Campus de Gambelas, 8005-139 Faro, Portugal.

E-mail address: pamonteiro@ualg.pt (P.D. Monteiro).

Table 1
Radiocarbon dates of Cabeço da Amoreira.

Provenience		Radiocarbon date	Material	Reference
North Profile (Jean Roche area)	Level 2	7406 ± 32 BP	<i>Scrobicularia plana</i>	Bicho et al. (2011)
	Level 22	7356 ± 33 BP	<i>Scrobicularia plana</i>	Bicho et al. (2011)
West Profile (Mendes Corrêa area)	Shellmidden layer	7273 ± 34 BP	<i>Scrobicularia plana</i>	Bicho et al. (2011)
	Structure 1	7450 ± 30 BP	<i>Scrobicularia plana</i>	Bicho et al. (2011)
	Hearth 1	6990 ± 30 BP	Charcoal	Bicho et al. (2011)
	Lower level	7370 ± 48 BP	<i>Scrobicularia plana</i>	Bicho et al. (2011)
Shellmidden área	Burial 2	6910 ± 40 BP	<i>Homo sapiens</i> (rib)	Bicho et al. (2012)
	Burial 3	7056 ± 34 BP	<i>Homo sapiens</i>	Bicho et al. (2012)
	Layer 2	6910 ± 40 BP	<i>Homo sapiens</i> (rib)	Bicho et al. (2012)
	Layer Z	7197 ± 25 BP	Charcoal	This paper

2. Cabeço da Amoreira

Cabeço da Amoreira is a Mesolithic site part of the Muge shell-middens complex (Bicho, 1994; Bicho et al., 2010; Gonçalves, 2014). It is located 60 km northeast from Lisbon in the Tagus valley, in the Muge river valley (Figs. 1 and 2). The site is dated from c. 8000 to 7000 cal BP, corresponding to the Atlantic period (Table 1) (Bicho et al., 2010, 2011, 2012). The climate changes from Pleistocene to Holocene transformed the Muge valley into an estuarine basin important for exploitation of both marine and woodland resources (Wollstonecroft et al., 2006; Schriek et al., 2008; Bicho et al., 2010). Several teams have been investigating in Cabeço da Amoreira since its discovery in 1863 (Ribeiro, 1884; Corrêa, 1933; Cardoso and Rolão, 1999/2000). Due to its dimensions, number of burials (more than 300), abundance of artefacts and preservation, Cabeço da Amoreira always has been one of the main references for a Mesolithic shellmidden in Portugal. The consequent interventions in the site through 20th century might have been responsible for the amount of discovers, but, unfortunately, the information lack on stratigraphy rigour, recovery of faunal and botanic remains and chronology control, biasing the understanding of the complexity of the site formation.

Cabeço da Amoreira is ~60 m in diameter and has been considered by Jean Roche one of the three residential settlements (along with Cabeço da Arruda and Moita do Sebastião), other shellmiddens had logistical functions (Roche and Ferreira, 1967). This assumption was based mainly on the dimensions of the site. The previous excavations of Mendes Corrêa (on 1930's) and Jean Roche (on 1960's) showed a first habitat occupation on Cabeço da Amoreira on the basin sand layers where structures like layers, pits and burials were identified. In a shell layer (approx. 1 m, mainly *Cerastoderma edule* and *Scrobicularia plana*), several skeletons were excavated in both campaigns in different areas of the site (Fig. 3). In order to understand the occupation of the site, a new interdisciplinary project lead by Nuno Bicho "The last hunters and gatherers of the Tagus Valley" is aiming to understand the economy, subsistence and define the social complexity of the Muge society, by excavating a new area in Cabeço da Amoreira (Area 1), applying methodologies that allow to control the stratigraphy and the spatial distribution of material. Systematic flotation method, sediment micromorphology, GIS, zooarchaeology, isotopes, shell, use-wear and lithic analyses and radiocarbon datation were applied (Umbelino, 2006; Detry, 2007; Bicho et al., 2010, 2011, 2012; Figueiredo, 2012; Dias et al., 2012; Bicho and Gonçalves, 2016; Marreiros et al., 2016). Also, profiles from Jean Roche and Mendes Corrêa excavation areas (Fig. 3) were cleaned, dated and sampled in order to correlate data and stratigraphy. So far, layers 1, 2, 3, 4 and Z were identified in Area 1

and several structures (Burial 2, Burial 3, Comb. 1, Pit. 1) were also identified.

Although the first references on charcoal were made by Jean Roche (Roche and Ferreira, 1967), there were no analyses applied. Charcoal analyses were first carried out in Cabeço da Amoreira since 2000, whilst José Rolão fieldwork (Fig. 3). *Pinus* sp. and *Quercus* sp. were the identified taxa of charcoal recovered on José Rolão area (Fig. 3) (Wollstonecroft et al., 2006).

Charcoal is the most abundant plant macroremains present in the site. Charcoal recovered in recent excavations in Area 1, West profile from Mendes Corrêa area and North profile from Jean Roche area is the main focus of this study. Here we present some of the ongoing research and present the data from Area 1: concentrated charcoal from Burial 2, Burial 3, Pit. 1, Comb. 1 and scattered charcoal from Layer 2, Layer 3 and Layer Z.

3. Materials and methods

Charcoal has been systematically recovered by flotation (0.5 mm, 0.25 mm), dry-sieving (3 mm, 1 mm) and hand-picked in Cabeço da Amoreira. Almost 4000 charcoal fragments have been analysed in recent studies for different levels of occupation in the shellmidden. The data here presented constitute the totality of the recovered charcoal (2–4 mm fraction) from Burial 2, Burial 3, Pit. 1 and Hearth 1, randomly sampled (up to 400 charcoal fragments) from scattered charcoal from Layer 2, 3 and Z, and the totality of the recovered charcoal from flotation of West profile (Mendes Corrêa area) and North profile (Jean Roche area). The data presented in this paper is based on the following contexts (Table 2):

Burial 2 (6910 ± 40 BP) – this is a burial of a young female skeleton that was identified in Area 1, deposited in Layer 2. The skeleton was deposited in a "bed" of stones/firecracks and covered with layers of shells, mammals (*Cervus elaphus*), crab claws and shells beads. The burial was easily identified by the shell matrix that differs from the rest of the Layer 2 and has 4 m² size; approx. 900 L of sediment were retrieved for flotation (Monteiro et al., 2014; Figueiredo et al., 2016). 726 charcoal fragments were recovered and analysed.

Burial 3 (7056 ± 34 BP) – this is a burial of an old male skeleton that was identified in Area 1, deposited in Layer 2. Unlike the Burial 2, this was not abundant in shells and had a different preparation, no shell layers or faunal remains were deposited. The burial had c. 2 m² of area. Presence of clay, charcoal and bone artefact were associated with the burial. 452 charcoal fragments were recovered and analysed from this context.

Pit. 1 – this structure (2 × 5 m; 930 L of sediment) was identified in Area 1 bellow Layer 2 and is composed by dark soil that distinguish from the shell layers (Layer 3). Charcoal, fauna remains, lithics

Download English Version:

<https://daneshyari.com/en/article/5113819>

Download Persian Version:

<https://daneshyari.com/article/5113819>

[Daneshyari.com](https://daneshyari.com)