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From Sado Valley to Europe: Mesolithic dietary practices through different geographic distributions

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ABSTRACT

This study presents new stable isotope (carbon and nitrogen) data from human and faunal remains from three Mesolithic shell middens (Cabeço das Amoreiras, Arapouco and Cabeço do Pez), located on the estuary of the Sado River, Portugal. The results have revealed a diet composed mainly of terrestrial C3 resources (from terrestrial animals and a small contribution from vegetable sources) and a proportion of marine resources close to 20%. These groups followed a subsistence pattern characterized by a variable settlement regime promoted by the availability of the resources in each region, and social and demographic factors that would induce human dietary diversification.

The Sado Valley results were compared with other European Mesolithic groups in order to provide a general view of the subsistence patterns of some of the last hunter-gatherer groups. The high degree of regionalization observed with the comparisons shows that it is impossible to characterise a single subsistence pattern for all European Mesolithic groups. In this sense, environmental characteristics, the geomorphology, the effectiveness of communities' adaptation, and the influence of social and demographic factors probably influenced Mesolithic subsistence patterns in Europe.

1. Introduction

The Mesolithic period is of particular interest in archaeology because it represents the last communities whose subsistence was based exclusively on hunting, fishing and gathering. This period saw the end of the general hunter–gatherer economic pattern in Europe, although there were some communities that followed this subsistence economy throughout the Neolithic period (Bollongino et al., 2013). In this regard, the extensive study of European Mesolithic communities provides information not only about a lifestyle that almost disappeared millennia ago, but also about the processes that took place during the change in the subsistence economy that led to the appearance of the first farming and herding societies.

Therefore, the study of European Mesolithic human remains provides details of individual subsistence patterns, which enables the inference of their adaptations to the environment and some of the social factors that define this period. Unfortunately, in many parts of Europe (especially in warmer regions such as Southern Europe), human remains from the Mesolithic are scarce and the collagen may be poorly preserved. Nevertheless, in some areas, such as Portugal, a great number of human remains have been discovered. Portuguese Mesolithic communities have generally been studied in relation to the shell middens at Muge, where more than 300 individuals have been recovered (Lubell et al., 1994).

Understudied and less well known, the complex of Sado Valley shell middens comprises eleven sites, of which six (Cabeço das Amoreiras, Arapouco, Cabeço do Pez, Poças de São Bento, Vale de Romeiras and Várzea da Mó) have yielded a total of 112 human skeletal remains (Cunha and Umbelino, 2001; Cunha, 2002–2003; Umbelino, 2006). The archaeological excavations of Sado shell middens were performed in the early and mid-twentieth century

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Fig. 1. Location of the Mesolithic sites in Sado Valley presented in this study.

and, regrettably, there is no publication of the fieldwork except for the excavation plan drawings of Cabeço das Amoreiras made by Mr. Dario de Sousa (Arnaud, 1989; Umbelino and Cunha, 2012). Recently, new projects are being carried in both Muge and Sado shell middens, and these will surely provide valuable new data in the next few years.

In this context, the main goal of the present study is to obtain new data on the subsistence pattern of some of these less-studied Mesolithic communities in Western Iberia, the Sado Valley complex. The dietary evidence of Sado Valley groups obtained from carbon and nitrogen stable isotope analysis allows their subsistence pattern to be established and that will lead to a better understanding of regional settlement and the use of estuarine landscapes in the Mesolithic. Subsequently, with the aim of characterizing European Mesolithic communities' subsistence, the data obtained in this study will be compared with data from other contemporary sites in the Iberian Peninsula and at other European Mesolithic sites. These comparisons will be carried out taking into account the environmental conditions in each geographic region.

2. The study sites: location, funerary structures and burial practices

The Sado Valley sites are located on the estuary of the Sado River (Fig. 1), approximately 40 km south of Lisbon in the province of Alentejo (Portugal). The studied sites, Cabeço das Amoreiras, Arapouco and Cabeço do Pez are located near the Sado shore, at the edges of a Miocene plateau, at an altitude of 40–50 m above sea