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Subsistence economy and land use strategies in the Burdur province (SW Anatolia) from prehistory to the Byzantine period

B. De Cupere ^{a, *}, D. Frémondeau ^b, E. Kaptijn ^a, E. Marinova ^{a, b}, J. Poblome ^c, R. Vandam ^d, W. Van Neer ^{a, e}

^a Royal Belgian Institute of Natural Sciences, Vautierstraat 29, 1000, Brussels, Belgium

^b Centre for Archaeological Science, University of Leuven, Celestijnenlaan 200e, 3000, Leuven, Belgium

^c Sagalassos Archaeological Research Project, University of Leuven, Blijde Inkomststraat 21/3314, 3000, Leuven, Belgium

^d Department of Anthropology, State University of New York at Buffalo, 380 MFAC Ellicott Complex, Buffalo, NY, 14261, USA

^e Department of Biology, University of Leuven, C. Deberiotstraat 32, 3000, Leuven, Belgium

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ABSTRACT

A reconstruction of the ancient subsistence economy and land use strategies is presented here for the province of Burdur, more specifically the area south and southeast of Lake Burdur, in southwestern Turkey. This review is based on the results from archaeozoological (including bone collagen carbon and nitrogen stable isotope analyses) and archaeobotanical analyses available from seven sites, dated to distinct time periods ranging from the Neolithic to the Middle Byzantine period. The data (both published and unpublished) are compiled with information available on settlement development and dynamics, in the study area. Results show changing agrarian and animal husbandry practices for a period of more than 8000 years, ranging between self-sustaining economies to specialised husbandry practices and an intensive agricultural exploitation of the landscape, in relation to human settlement activities.

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1. Introduction

With the onset of the Neolithic, human societies emerged in which the exploitation of cereals and animal husbandry provided the staple subsistence resource. This inevitably resulted into a modification of the natural environment (Goudie, 2013: 11–20). These early subsistence economies led to the rise of sedentary life, the ability of producing food surpluses and an increase of population densities (Colledge et al., 2005). In the subsequent periods, the further development of economic subsistence strategies, that were depending on cultural, biotic and abiotic backgrounds, caused considerable impact on the landscape (Dearing et al., 2006; Goudie, 2013; Walsh, 2014). Studies of ancient subsistence strategies are therefore of great importance for understanding the organisation of agricultural production – including the cultivation of crops and the

raising of animals – through time and its link to land use intensity, technological developments and social complexity. Providing direct evidence on the scale and nature of early plant and animal cultivation is not only relevant for archaeological research, but also for other disciplines like paleoecology, geomorphology and land use reconstructions and modelling. Also, it can be of great importance for simulations of pre-industrial land use (Kaplan et al., 2011).

Human impact on the environment, related with the beginnings and development of agrarian subsistence, took place in Anatolia as early as the 9th millennium BC (Asouti and Fairbairn, 2010; Düring, 2011: 16–17). Human communities underwent thorough changes during prehistory, starting from the Neolithic (8500–6100 B C), continuing through the Chalcolithic (6100–3000 B C) and followed by the development of urban communities and more complex societies in the Early Bronze Age (3000–2000 B C) (Sagona and Zimansky, 2009; Düring, 2011). The Lake District (SW Anatolia) – including the Burdur region – plays a major role in the discussions on diffusion and/or migration processes from the Near East into Europe during Neolithic times (Thissen, 2010; Brami and Heyd, 2011; Düring, 2011). Also in later periods, the Burdur region continued to play a pivotal role, because of its location along one of the major north-south routes through this mountainous area as

* Corresponding author.

E-mail addresses: bdcupere@naturalsciences.be (B. De Cupere), Delphine.Fremondeau@bio.kuleuven.be (D. Frémondeau), ekaptijn@naturalsciences.be (E. Kaptijn), Elena.Marinova@bio.kuleuven.be (E. Marinova), jeroen.poblome@arts.kuleuven.be (J. Poblome), ralfvand@Buffalo.edu (R. Vandam), wvanneer@naturalsciences.be (W. Van Neer).

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well as being connected to routes leading west, in combination with the presence of a vast area of fertile land (Mitchell, 1993; Talloen, in press). During the Roman Imperial period the archaeological site of Sagalassos became a large urban center that fulfilled a central role in the wider region (Waelkens, 2011; Waelkens et al., 2011).

Archaeological research in the Burdur province (SW Anatolia) documents the rise and continuous change of settlements from the Neolithic (7th millennium BC onwards) up to the Byzantine times (11th/13th century AD) (e.g. Vanhaverbeke and Waelkens, 2003; Kaptijn et al., 2012, 2013; Vandam et al., 2013; Vandam, 2014, 2015; Vandam et al., in prep.). Furthermore, there is an increasing number of environmental and bioarchaeological studies available for this region. Archaeobotanical reports from this area (Helbaek, 1970; Nesbitt, 1996; Martinoli and Nesbitt, 2003) provide information on the crops grown in the Late Neolithic and Chalcolithic periods. Studies on faunal assemblages have been published by Westley (1970), Deniz and Şentuna (1988), De Cupere (2001), De Cupere and Duru (2003) and De Cupere et al. (2008). Several palynological and paleoecological studies (Bottema and Woldring, 1984; Eastwood et al., 1998; Vermoere et al., 2002; Vermoere, 2004; Kaniewski et al., 2007; for a more recent review see; Bakker et al., 2012) focussed on the development of land use and the human impact on vegetation, as well as on past climatic changes. Complementary information on the exploitation of animals within this region was obtained through geochemical evidence (Vanhaverbeke et al., 2011a). Human diet and animal husbandry practices in the Classical/Hellenistic (400–200 B C), Roman Imperial (25BC–450 AD) and Byzantine (450–1200 AD) periods were reconstructed through bulk collagen stable isotope analyses (Fuller et al., 2012).

The environmental archaeological studies, available for the Burdur region, can, if combined, be highly informative on past subsistence practices in the region, but are until now not sufficiently explored. Therefore, the objective of this contribution is to compile and, as far as possible, to integrate all available information – both published and unpublished – from archaeozoological and archaeobotanical research, together with relevant archaeological evidence, in order to provide a diachronic (and where possible spatial) reconstruction of subsistence and land use strategies in the study area from prehistory into the Byzantine period. This article seeks to elucidate the interaction between human society, subsistence economies and the environmental setting.

2. Physical setting and description of the study area

The area for which the data will be presented in this paper is located within the province of Burdur (SW Turkey), ~100 km north of the Turkish Mediterranean coast, and covers a surface of approximately 1200 km² (Fig. 1). The study area is part of the Lake District and characterised by the presence of mountains, intermountain basins and the large saline Lake Burdur within the Burdur basin. The highest peaks in the study area range between 2000 m (Beşparmak) and 2275 m (Akdağ). The intermountain valleys (like those of Ağlasun, Hisarköy, Çanaklı, and Çeltikçi-Bağsaray) are generally filled with clay sediments (Dusar et al., 2012). The valley of Ağlasun is located at a height of approximately 1100 m. More to the south, the plain near Bucak is situated at an altitude of about 750–800 m a.s.l. To the southwest of the Burdur lake (about 850 m a.s.l.), the Burdur plain can be found, between the modern villages of Düğer and Kuruçay; its altitude rises in accordance to the distance from the lake up to 950 m a.s.l.

To the east and southeast of Lake Burdur, a large zone of marl deposits occurs, the so-called 'Badlands of Burdur'.

The climate in this region is considered to have an Oro-Mediterranean character, with typically dry hot summers and long wet winters (Paulissen et al., 1993). From July until September the area is submitted to arid conditions, whereas the other months are quite humid. Temperatures frequently drop below freezing point during the winter months and most of the precipitation falls in January and December, primarily in the form of snow.

The natural vegetation in the study area belongs to the Oro-Mediterranean zone, mainly characterised by forests of *Pinus brutia*, *P. nigra* and deciduous trees such as *Quercus cerris* (Zohary, 1973). However, the vegetation consists nowadays of a mixture of Mediterranean forests and woodlands, mainly composed of *Pinus nigra*, *Juniperus excelsa* and *J. oxycedrus*, and to a lesser degree *Quercus coccifera* (Bakker, 2012, p. 9). Today the most fertile areas are virtually all under cultivation, while intensive grazing pressure has taken place on the lower slopes, around the agricultural fields, and resulted in maquis or quite open anthropogenic steppe with, among other species, *Q. coccifera*, *J. oxycedrus*, *Artemisia herba/alba* and *Astragalus* (Kaniewski et al., 2007).

3. Material and methods

As already mentioned in the introduction, the data of principally two disciplines will be used to make inferences on the subsistence and land use strategies within the study area through time. These are archaeozoology and archaeobotany. The chronological frame addressed in this paper ranges from the Neolithic to the Byzantine periods. It was tried to gather as much information as possible from these two disciplines for the different periods. Data of own research was used, as well as published data by other researchers. Materials from the following sites have been considered: Düzen Tepe, Hacılar, Hacılar Büyük Höyük (here after called Hacılar BH), Höyücek, Kuruçay, Sagalassos and Bademağacı. The site of Bademağacı is located at about 50 km south of our study area; nevertheless its data were also included, as it is situated within an environment which is very similar to the one discussed here. By including the data of this site, it is possible to make inferences about the Neolithic in the wider region of Burdur.

Faunal and macrobotanical assemblages are widely recognised to be a valuable source of information on past human activities and they are often used to reconstruct the human diet or, more generally, subsistence in the past (Jacomet and Kreuz, 1999; Reitz and Wing, 1999). Plant remains can indeed document the presence of locally cultivated crops, weeds, imported plants or plants collected in the wild, and provide information on the agricultural developments, vegetation and land use (Jacomet and Kreuz, 1999). Due to the soil conditions in the study area, only charred plant remains are preserved (with charring being most often the result of daily settlement activities).

Faunal remains document the importance of hunting versus herding, the composition of livestock and the exploitation of animals (Davis, 1987; Reitz and Wing, 1999). The contribution or importance of each animal species or group is considered to be reflected by the number of their respective remains (Reitz and Wing, 1999). In this paper the quantification of the faunal remains is based on the Number of Identified Specimens (NISP), which represents the total number of identified elements of each species or taxonomic group. Worked bones or antler fragments are not included, since artisanal activity implies selection and possible concentration (e.g. De Cupere, 2001) and could, therefore, lead to false conclusions about the importance of a certain species in the

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