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Animal exploitation in SW Iberian Peninsula during the Neolithic period: A Zooarchaeological perspective from Barranco do Xacafre (Ferreira do Alentejo, Portugal)

Exploração animal no Sudoeste da Península Ibérica durante o período Neolítico: uma perspectiva zooarqueológica do Barranco do Xacafre (Ferreira do Alentejo, Portugal)

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ABSTRACT: This study analyses the faunistic collection recovered at Barranco do Xacafre (Ferreira do Alentejo, Portugal). The intervention undertaken revealed two negative features interpreted as ditches, dating back to the second half of the 4th millennium BC (Late Neolithic). The main goal of this paper is to study the relationship between the Neolithic communities and animals from a sociocultural and economic perspective. In particular, it aims to understand the importance of domestication in relation to hunting activities and verify the use that was given to each species, as well as the strategies for exploitation of the carcasses and management of animal resources. The collection is composed mostly of mammalian fauna, where sheep and goat as well as cow and aurochs are the prevalent species, while pig, wild boar and dog are significantly less represented. Domestic and/or wild horse and cervids, namely red deer and roe deer are also significant. The malacological remains observed correspond to bivalves, such as the scallop, the clam, the mussel and the smooth clam. Fragments of undetermined passeriform birds were also identified. The results revealed a significant presence of wild but also domestic species, indicating exploitation strategies based on both hunting and pastoralism.
KEYWORDS: Zooarchaeology; Late Neolithic; Barranco do Xacafre; Alentejo; Domestic vs. wild species.

RESUMO: Neste estudo foi analisada a coleção faunística recuperada no sítio do Barranco do Xacafre (Ferreira do Alentejo, Portugal). A intervenção realizada permitiu identificar duas estruturas negativas interpretadas como fossos, datados da segunda metade do IV milénio a.C. (Neolítico Final). O principal objectivo é compreender a relação entre as comunidades humanas do Neolítico e os animais, numa perspectiva sociocultural e económica. Em particular, conhecer a importância da domesticação face às actividades

cinegéticas, verificar o uso que era dado a cada espécie, assim como as estratégias de aproveitamento das carcaças e gestão dos recursos animais. A coleção é composta principalmente por mamíferos, sendo a ovelha e a cabra, assim como a vaca e o auroque as espécies predominantes, enquanto que o porco, o javali e o cão apresentam uma baixa representatividade. O cavalo doméstico e/ou selvagem e os cervídeos, nomeadamente o veado e o corço são também bastante significativos. Os restos malacológicos observados correspondem a bivalves, como a vieira, a amêijoa, o mexilhão e a ameijola. Também se identificaram fragmentos de aves passeriformes indeterminadas. Os resultados revelaram uma presença significativa de espécies selvagens e domésticas, o que indica estratégias de exploração baseadas na caça e na pastorícia.
PALAVRAS-CHAVE: Zooarqueologia; Neolítico Final; Barranco do Xacafre; Alentejo; Espécies domésticas vs. selvagens.

1. INTRODUCTION

The second half of the 4th millennium BC (cal 3500 – 3000 BC) is a period traditionally considered as a "Late Neolithic" for most Portuguese and Spanish archaeologists in South-western Iberia (Almeida *et al.* 2021). This period is characterized by the development of sites, with a more complex architectural and functional structure, standing out the spread of ditched enclosures (Valera *et al.* 2017) and open-air hilltop settlements. The settlement system documents the increase in density and sedentarism of human populations. At same time, plant and faunal evidence points to an increase in productivity, alongside a decrease in hunting activities (Valente 2016). According to some authors (Jorge 2000; Gonçalves 2000/2001), Late Neolithic is the period when a full production economy associated with a sedentary lifestyle finally replaced the older, more mobile subsistence strategies. They also consider that the earliest signs of the secondary products revolution are dated to this period, preluding the establishment of the typical Chalcolithic economic system and social organisation (Valente – Carvalho 2014). In the Alentejo region, several Late Neolithic sites are known, including a large number of ditched enclosures (Valera *et al.* 2017). Is in that region that Barranco do Xacafre is placed.

The site of Barranco do Xacafre is located in Ferreira do Alentejo, district of Beja, Portugal (Fig. 1a), within a plain area intertwined with soft hills, at a medium altitude of 115 meters. Archaeological investigations at this site were undertaken within a wider framework that aimed to minimize the impact that the construction of the Ervidel irrigation system could have on cultural heritage (Baptista – Gomes 2015). During the intervention, three test trenches were excavated, revealing two ditches. The trenches 1 and 2 (Figs. 1b and c) revealed parts of the first ditch. Nevertheless, the intervention area was too small to understand the morphology of this ditch, since the excavated area revealed a marginal area of the structure. In trench 3 (Fig. 1c), situated 70 meters away from the other two trenches, another ditch-type feature was identified. This second negative structure was characterized by a trapezoidal profile, with a flat bottom, a depth of 1.14 meters and a maximum width varying between 2.34 meters at the top and 0.30 at the base. As for the material culture, lithics, ceramic fragments and faunal remains were uncovered in both ditches and, according to Baptista & Gomes (2015), the characteristics of these materials indicate that these structures were infilled in the second half of the 4th millennium BC, corresponding to Late Neolithic period. Moreover, the most represented ceramic forms of Barranco do Xacafre concern closed truncated cone shapes, some with globular and closed spherical bodies. Regarding decoration, the presence of nipples, sometimes double, incised lines, punched triangles filled with white paste and a vase with ocular decoration strands out. These ceramics are similar to the pottery unearthed in ditch 12 of the Perdigões ditch-enclosure complex, which was radiocarbon dated to the 4th millennium BC (Valera 2012). Drawing on the data analysed in the framework of the author's master thesis (Aleixo 2018), this study of Barranco do Xacafre's fauna aims to offer a better understanding of the relationship between human communities and animals, from a sociocultural and economic perspective, in the SW Iberian Peninsula during the Late Neolithic period.

2. MATERIALS AND METHODS

The zooarchaeological remains of Barranco do Xacafre were identified in the context of the two Late Neolithic ditches. The faunistic materials from ditch 1 were exhumed in stratigraphic units (hereafter referred to as SU) 100, 200, 203, 001 and 002, and ditch 2 in stratigraphic units 300, 302, 303 and 003. The SU 100, 200, 203, 300, 302 and 303 are infilling deposits and 001, 002 and 003 correspond to the superficial sediments (Baptista – Gomes 2015). Both ditches included remains of vertebrates (mammals) and invertebrates (molluscs).

The Morphological and taxonomic identification was undertaken with the support of the reference collections available at the Laboratório de Arqueologia e Restauro of the University of Algarve and the Laboratório de Arqueociências (LARC), as well as several manuals of identification (e.g., Schmid 1972; Barone 1976). The distinction between similar species was based on the parameters provided by specialized references, such as Boessneck (1969), Zeder – Lapham (2010), and Zeder – Pilaar (2010), for the distinction between sheep (*Ovis aries*) and goat (*Capra hircus*); and Albarella *et al.* (2005) for wild boar (*Sus scrofa*) and pig (*Sus scrofa domesticus*). To distinguish aurochs (*Bos primigenius*) and cattle (*Bos taurus*), the linear biometric data of Barranco do Xacafre's sample was compared with other Portuguese archaeological sites, an approach that was also used to distinguish dog (*Canis familiaris*) and wolf (*Canis lupus*). Whenever a specific taxonomic classification was not possible, the remains were classified according to the size of animals: medium-sized animals (e.g., dog, caprine, swine) and large-sized animals (e.g., horse, red deer, cattle). None of the remains are classified as a small-sized animal. Regarding the quantification of materials, this analysis used the following indexes: Total Number of Remains (TNR), Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI), considering laterality, the different slaughtering ages and the

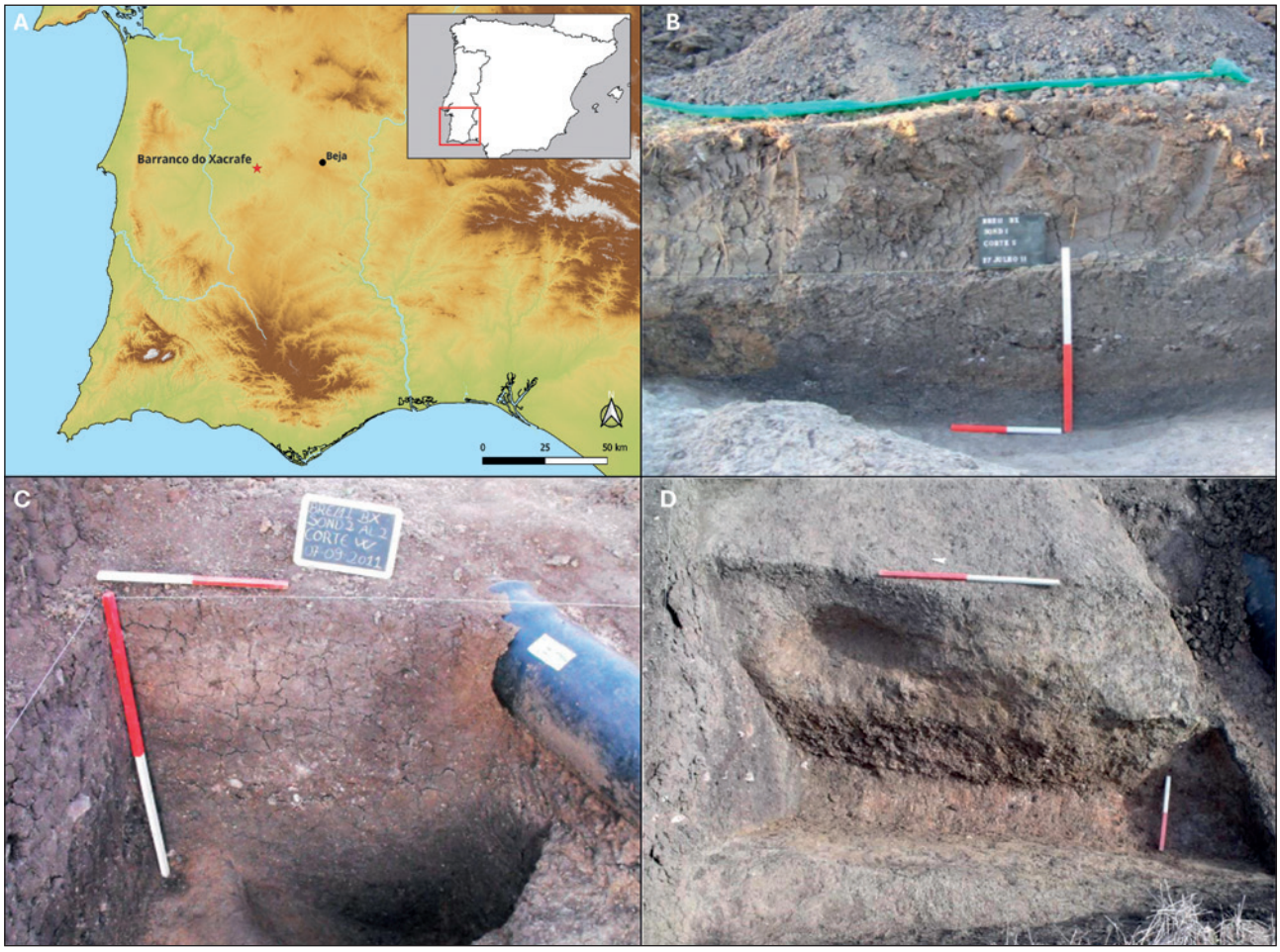

FIG. 1 a) Location of Barranco do Xacafre; **b)** Southeast section of trench 1 (Baptista – Gomes 2015); **c)** Southwest section of trench 2 (Baptista – Gomes 2015); **d)** Final plan of trench 3 (Baptista – Gomes 2015).

biometric data. To calculate the MNI it was also important to record which portions of bone was present, the division of portion was based on Dobney – Rielly (1988), with some adaptations (see Aleixo 2018).

The age of death of animals is usually obtained using two methods: the fusion of the epiphyses and the dental eruption and wear. In the case of bone fusion, the following references were used according to each species: for swine (Silver 1969; Barone 1976; Zeder – Lemoine – Payne 2015), for cattle (Silver 1969; Habermehl 1975; Barone 1976) and for caprines (Silver 1969; Barone 1976; Zeder 2006). Dental eruption and teeth wear were defined using the following references: Horard-Herbin (2000) for dogs; Levine (1982) for equids; Bull – Payne (1982), Lemoine *et al.* (2014) for swine; Grant (1982) for cattle; and Payne (1973) and Grant (1982) for caprines. Finally, in the case of cervids, we followed the study of Bowen *et al.* (2016) for the dental wear of the fallow deer (*Dama dama*). Following the methodology suggested in several of these references, we adopted a simplified classification of the age groups: juveniles, young adults and adults.

Bone surface modifications were also analysed, particularly regarding anthropic modifications. The anthropic alterations verified in the analysed sample include cut marks, percussion notches, fractures and thermo-alterations, namely by contact with fire (Shipman – Rose 1983; Shipman – Foster – Schoeninger 1984). Modifications caused by natural agents encompassed both physic (e.g., weathering, action of terrestrial gastropods and roots, and fragmentation) and chemical agents, such as calcium carbonate precipitation and manganese oxide precipitation. These modifications were defined according to Behrensmeyer (1978); Fernandéz López (2000); Lyman (2001); Bennásar Serra (2005); Marín Arroyo *et al*. (2008) and Fernandez-Jalvo – Andrews (2016).

As for the osteo and odontometric data, we followed the procedures proposed by Driesch (1976) and Davis (1992), the different measures being obtained with a digital calliper.

Finally, the identification of the malacological fauna was based on the studies of Macedo *et al.* (1999) and Saldanha (1995), as well as through a comparative approach with the reference collection available at the Laboratório de Arqueologia e Restauro of University of Algarve. To quantify these remains, we determined the Total Number of Remains (TNR), Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI), considering the parity and the number of entire valves (or fragmented valves with a preserved hinge and/or umbo) for the presence of bivalves.

3. RESULTS

3.1. General description of the collection

In this study, 2370 remains were analysed, from which 565 permitted identification (NISP), corresponding to 24% of the total material.

The analyses of the faunal assemblage of Barranco do Xacafre revealed a significant number of mammal remains (98% of the total collection), in a moderate condition of preservation, while malacological fauna represent only 2% of the assemblage. Fragments of undetermined passeriform birds were also identified.

Concerning the first ditch, a total of 2143 faunal remains were exhumed and, from these, 511 allowed identification. In this ditch, caprines are the prevalent species (35,2% NISP; and though both sheep and goat were identified, goats are prevalent), followed by bovines (25,4% NISP), which include both cattle and aurochs. By order of abundance, the other identified taxa are the following: equids (18,8%; the distinction between species, however, was not possible), cervids (18,2%; where the red deer is much more significant than fallow deer) and finally swine (2,4%; only wild boar was identified, but the presence of pigs is a possibility nonetheless). Furthermore, this ditch comprises a significant number of large and medium-sized mammals and some remains of non-identified birds. The distribution of species by stratigraphic unit can be seen in Table 1.

The second ditch contained a reduced sample when compared to ditch 1, consisting of 227 fragments, from which 54 were identifiable (Tab. 1). Most of these remains belong to caprines (51,9% NISP; especially goat), followed by bovines (14,8%), cervids (12,9%; only red deer was identified) and canids (11,1%; only dog was observed). Equids are the species with the lower representativity (9,3%). Swine remains are absent. Large and medium-sized mammal bones were also observed.

TABLE 1 GENERAL QUANTIFICATION OF FAUNAL REMAINS

		DITCH 1							DITCH 2					
Taxon	Common name	100	200	203	001	002	Total	% NISP	300	302	303	003	Total	% NISP
Canis familiaris	dog	–	–	–	–	–	0	0,00%	–	–	6	–	6	11,11%
Equus sp.	horse/donkey	36	18	30	3	9	96	18,79%	1	1	1	2	5	9,26%
Sus scrofa	wild boar	–	–	1	–	–	1	0,20%	–	–	–	–	0	0,00%
Sus sp.	pig/wil boar	3	5	1	–	2	11	2,15%	–	–	–	–	0	0,00%
Cervus elaphus	red deer	37	21	15	3	13	89	17,42%	–	–	5	2	7	12,96%
Capreolus capreolus	roe deer	–	4	–	–	–	4	0,78%	–	–	–	–	0	0,00%
Bos taurus	cow	1	–	4	–	–	5	0,98%	–	–	–	–	0	0,00%
Bos primigenius	aurochs	4	1	3	1	–	9	1,76%	–	2	–	–	2	3,70%
Bos sp.	cow/aurochs	53	18	32	–	13	116	22,70%	–	3	1	2	6	11,11%
Ovis aries	sheep	2	2	3	2	–	9	1,76%	–	–	–	1	1	1,85%
Capra hircus	goat	3	3	4	1	2	13	2,54%	–	–	–	3	3	5,56%
Ovis aries/ Capra hircus	sheep/goat	48	41	29	23	17	158	30,92%	–	14	8	2	24	44,44%
NISP Mammals	–	187	113	122	33	56	511	–	1	20	21	12	54	–
LSA	–	256	189	203	–	152	800	–	1	15	28	9	53	–
MSA	–	95	193	93	7	104	492	–	3	27	56	2	88	–
MSA/LSA	–	275	29	15	–	15	334	–	–	6	20	–	26	–
ND Mammals	–	626	411	311	7	271	1626	–	4	48	104	11	167	–
Birds	–	–	1	–	–	4	5	–	–	–	6	–	6	–
ND Birds	–	–	1	–	–	4	5	–	–	–	6	–	6	–
TNR	–	813	526	433	40	331	2143	–	5	68	131	23	227	–

The Number of Identified Specimens (NISP), the Total Number of Remains (TNR) and the Non-determined Remains (ND) f or each ditch and stratigraphic unit, and the respective total in number and percentage are presented.

3.2. Description of the collection by species

3.2.1. Canids: dog (*Canis familiaris*, Linnaeus 1758)

The distinction between *Canis lupus* (wolf) and *Canis familiaris* (dog) was possible through the comparison of the measurements of the mandibular 1st molar between Barranco do Xacafre, Cabeço da Amoreira (Detry – Cardoso 2010), Leceia (Pires *et al.* 2002), Castro do Zambujal (Driesch – Boesneek 1976), Alcáçova de Santarém (Davis 2006) and the current wolf (Detry – Cardoso 2010). Based on this information, the data comparison, as can be observed in Figure 2a, reveals that the canid present in Barranco do Xacafre can be integrated into the size frame of the dog, with the dimensions of M1 being much smaller than those of the current wolf. The size of the identified tooth is similar to those of Castro do Zambujal and Alcáçova de Santarém, which were also identified as dog. The dog is represented by six bones, namely four fragments of one mandible and two lower canine teeth (see Tab. 2), corresponding to one adult individual (MNI) from ditch 2 (Tab. 3). The age of death was obtained through the analysis of the 1st lower molar wear. According to Horard-Herbin (2000), this 1st lower molar presents a slight wear, corresponding to an estimated age ranging between 24 and 36 months (adult).

3.2.2. Equids: domestic horse and/or wild horse (*Equus caballus*, Linnaeus, 1758 and/or *Equus ferus*, Boddaert 1785)

The distinction between the different species of equids is a complex topic, due to the enormous skeletal similarity that they present, namely between the domestic and wild horse. The method used for this distinction is the analysis of the enamel shape of the lower and upper molars. Taking into account the analysis of the teeth, the remains of equids from this site were classified as horse, although the state of its domesticity cannot be determined with certainty. The collection analysed in this study has a significant number of equids with a total of 101 remains. Ditch 1 has a significative higher number of remains when compared with ditch 2 (94 to 16, respectively), with a large concentration of these remains coming from SUs 100, 200 and 203. In ditch 1 all parts of skeleton are present (cranial and axial elements, bones from anterior and posterior appendicular skeleton). On the other hand, only elements of appendicular skeleton are observed in ditch 2. The calculated MNI is 14 adults (10 from ditch 1 and 4 from ditch 2). As for the age of death, the procedure followed was also based on teeth, as suggested by Levine (1982), and the subsequent study of mandibles revealed that the age of death of these individuals varies mainly between 3 and 12 years old (adults).

3.2.3. Swine: pig and or/wild boar (*Sus scrofa domesticus*, Erxleben, 1777 and/or *Sus Scrofa*, Linnaeus 1758)

The number of swine bones in this collection is 11 (cranial and posterior appendicular skeleton), corresponding to five individuals (four identified as *Sus* sp. and one as *Sus scrofa*), all unearthed in ditch 1. In ditch 2 swine remains are absent. The distinction between pig and wild boar is often difficult, particularly in Western Iberia due to their overlapping size. Nevertheless, size and, especially, the shape variation of the lower 3rd molar can be a way to distinguish between wild and domesticated swine remains (Albarella *et al.* 2005). In this case study it was only possible to identify one lower 3rd molar, corresponding to a wild boar. The obtained biometric data from this tooth was also compared with Leceia, Castro do Zambujal (Driesch – Boessneck 1976), Alcáçova de Santarém (Davis 2006) and the measurements for the current *Sus scrofa* in Portuguese territory (Correia 2015). Comparing the data (Fig. 2b) it is possible to deduce that the values with the highest length (L >35mm) and with Wa/Wc (crown width of anterior pillar divided by the crown width of the central pillar) around 1 are from wild boar, while, based on Albarella *et al.* (2005), the others are from pig. For the age of death, it was possible to establish the approximate age of eight remains, revealing that these bones are from adult individuals (+ 24 months), except one mandible whose molar tooths correspond to an age of 12-16 months (young adult).

3.2.4. Cervids: Red deer and roe deer (*Cervus elaphus* and *Capreolus capreolus*, Linnaeus 1758)

An important number of red deer was observed, with a total of 96 remains, distributed between both ditches, although ditch 1 contains a significative higher number of fragments than ditch 2 (84 and 7,

respectively). In ditch 1 all parts of skeleton are present (cranial and axial elements, bones from anterior and posterior appendicular skeleton) and in ditch 2 only remains of the anterior and posterior appendicular skeleton were observed. The MNI for this species is 13 (11 from ditch 1 and two from ditch 2). Whereas it was not possible to establish specific ages, due to the absence of mandibles with several teeth, the analysed remains correspond to adult individuals. As for the roe deer, only 4 fragments of antlers were observed (MNI 1), from ditch 1 (specifically from SU 200), naturally indicating that it is a male individual.

3.2.5. Bovines: Cattle and aurochs (*Bos taurus* and *Bos primigenius*, Linnaeus 1758)

The distinction between cattle and aurochs was established through metric comparisons of the distal humerus and astragalus (Figs. 2c and 2d) between Barranco do Xacafre, Muge (Detry 2007), Alcáçova de Santarém (Davis 2006) and Lameiras (Davis – Gabriel – Simões 2018), the last one only for the astragalus comparisons. Notwithstanding, this distinction must be made with caution, since the bone size of an ox (male) and a female aurochs can be very similar (Davis – Detry 2013). Osteometric and odontometric data can

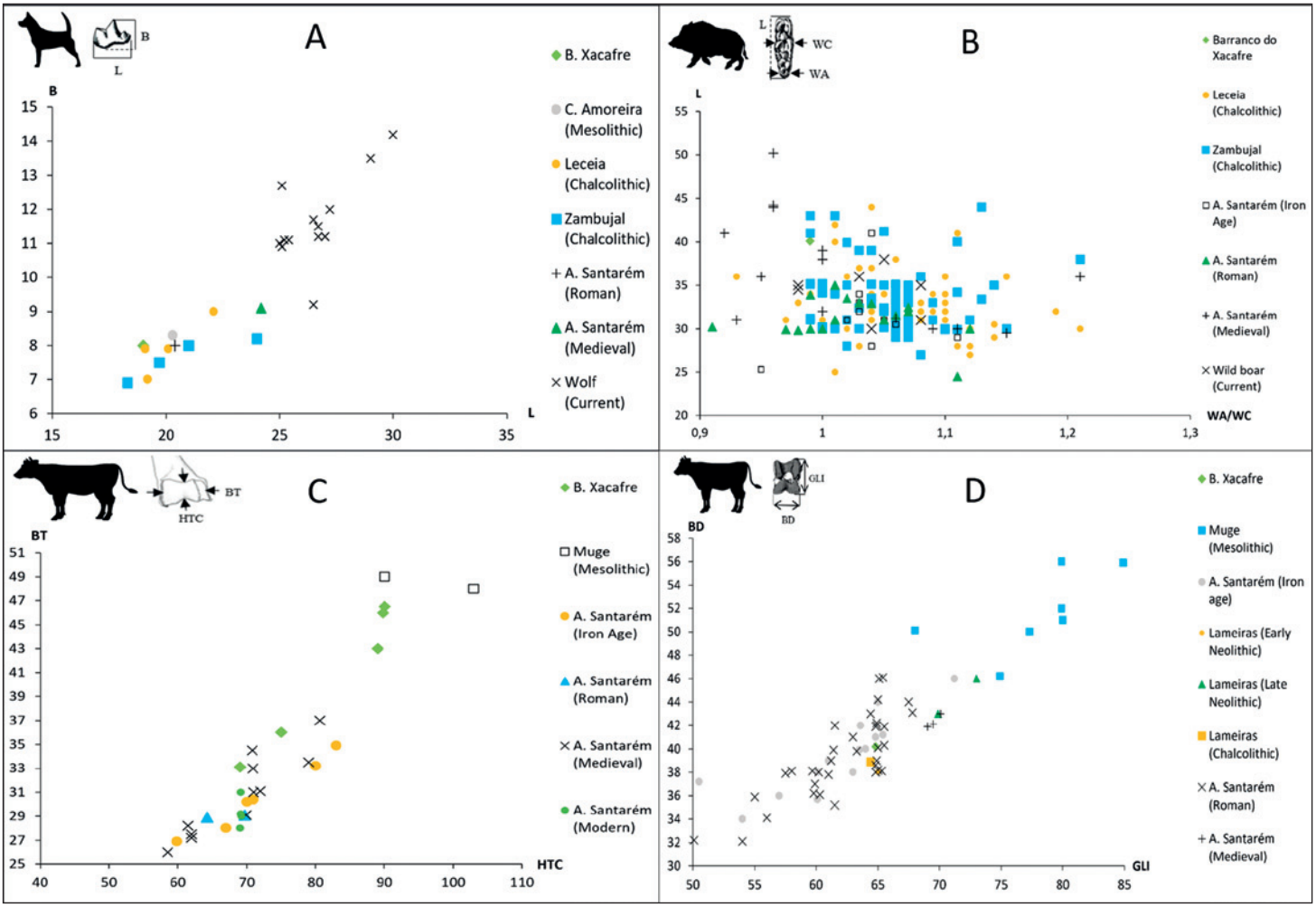

FIG. 2 a) *Canis familiaris* mandibular first molar: metric comparison, using length and breadth measurements. Values in millimetres. Barranco do Xacafre, Cabeço da Amoreira (Detry 2010), Leceia (Pires *et al.* 2002), Castro do Zambujal (Driesch – Boessneck 1976), Alcáçova de Santarém (Davis 2006) and the current wolf (Detry – Cardoso 2010); **b)** *Sus scrofa* mandibular 1st molar: metric comparison, using length (L) and the value of the anterior pillar width (WA) divided by the value of the central pillar width (WC). Barranco do Xacafre, Leceia (data provided by Cleia Detry and Umberto Albarella), Castro do Zambujal (Driesch – Boessneck 1976), Alcáçova de Santarém (Davis 2006) and the current wild boar (Correia 2015); **c)** Distal humerus of *Bos taurus* and *Bos primigenius:* metric comparison, using BT (trochlea width) and HTC (vertical diameter of the trochlea at its central constriction). Barranco do Xacafre, Muge – Moita do Sebastião and Cabeço da Arruda (Detry 2007), and Alcáçova de Santarém (Davis 2006); **d)** Astragalus of *Bos taurus* and *Bos primigenius:* metric comparison using GLI (Greatest length) and BD (breadth of distal end). Values in millimetres. Barranco do Xacafre, Muge – Moita do Sebastião, Cabeço da Arruda and Cabeço da Amoreira (Detry 2007), and Alcáçova de Santarém (Davis 2006).

TABLE 2 ANATOMICAL DISTRIBUTION OF REMAINS

	DITCH 1																											
Anatomical part/Taxon	SU 100									SU 200								SU 203										
	EQ	S	CEE	BTA	BPR	B	OA	CH	O/C	EQ	S	CEE	CC	B	OA	CH	O/C	EQ	SS	S	CEE	BTA	BPR	B	OA	CH	O/C
Cranial elements																												
horn	–	–	–	–	–	–	–	–	–	–	–	1	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
cranium	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
maxilar	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
upper teeth	11	–	3	–	–	13	–	–	7	–	–	–	–	2	–	–	8	4	–	–	–	–	–	7	–	–	4
mandible	1	1	–	–	–	–	–	–	1	3	1	3	–	–	–	–	2	–	–	–	2	–	–	–	–	–	1
lower teeth	5	–	3	–	–	7	–	1	11	1	2	1	–	2	2	1	22	2	1	–	1	–	–	4	2	2	10
teeth	2	–	1	–	–	–	–	–	8	–	1	–	–	–	–	–	4	1	–	–	–	–	–	–	–	–	1
Axial elements																												
vertebra	–	–	2	–	–	1	–	–	5	–	–	2	–	1	–	–	–	2	–	–	–	–	–	–	–	–	4
rib	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
pevis	–	–	–	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
sacrum	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Anterior appendicular																												
scapula	1	–	13	–	–	1	–	–	7	1	–	2	–	1	–	–	1	11	–	–	–	–	–	4	–	–	1
humerus	–	–	5	–	1	6	–	–	–	–	–	2	–	–	–	–	1	3	–	–	1	–	1	2	–	2	3
radio	5	–	1	–	–	4	2	–	–	–	–	–	–	–	–	–	2	–	–	–	5	–	–	3	–	–	3
ulna	–	–	1	–	–	–	–	–	–	–	–	3	–	–	–	–	1	–	–	–	2	–	–	–	–	–	1
rádio + ulna	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–
carpals	–	–	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
metacarpal	–	–	–	1	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Posterior appendicular																												
femur	–	–	–	–	–	1	–	–	3	2	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
patella	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
tibia	4	–	–	–	–	5	–	1	–	3	–	3	–	1	–	1	–	2	–	–	1	–	–	5	–	–	–
astragalus	–	–	1	–	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	1	–		–	–	–
calcaneus	–	–	2	–	–	2	–	–	1	4	–	–	–	–	–	1	–	2	–	–	–	–	–	1	–	–	–
tarsals	–	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
metatarsal	–	–	–	–	1	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	2	–	–	3	–	–	–
Others																												
metapod	1	–	–	–	–	1	–	–	4	–	–	–	–	3	–	–	–	–	–	–	–	–	–	5	–	–	1
phalanx 1	2	1	–	–	1	2	–	–	–	1	1	1	–	4	–	–	–	–	–	–	1	–	–	–	–	–	–
phalanx 2	1	1	3	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	2	–	–	–	–
phalanx 3	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	36	3	37	1	3	54	2	3	48	18	5	21	4	19	2	3	41	30	1	1	15	1	3	35	3	4	29

Canis familiaris (CF); *Equus* sp. (EQ); *Sus scrofa* (SS); *Sus* sp. (S); *Cervus elaphus* (CEE); *Capreolus capreolus* (CC); *Bos taurus* (BTA); *Bos primigenius* (BPR); *Bos* sp. (B); *Ovis aries* (OA); *Capra hircus* (CH); *Ovis aries/Capra hircus* (O/C).

													DITCH 2															
	SU 001						SU 002						SU 300	SU 302					SU 303				SU 003					
	EQ	CEE	BPR	OA	CH	O/C	EQ	S	CEE	B	CH	O/C	EQ	EQ	BTA	BPR	B	O/C	CF	EQ	CEE	BPR	O/C	EQ	CEE	B	OA	CH	O/C
	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	11	–	–	–	–	–	4	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	2
	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	4	–	–	–	–	1	–	–	–	–	–
	2	–	–	2	–	10	3	–	5	–	–	9	–	–	–	–	1	1	2	–	–	–	–	–	–	–	1	–	–
	–	–	–	–	–	2	1	–	–	6	–	1	–	–	–	–	–	8	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	4	–	–	–	–	–	–
	–	2	–	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	2	1	2	–	–	–	–	–	–
	–	–	–	–	–	–	1	–	–	2	–	1	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	1	–	1	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	1	–	–	2	–	2	–	–	–	–	–	–
	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
	1	–	–	–	–	–	–	2	3	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	3	3	1	2	1	23	9	2	13	13	2	17	1	1	1	2	2	14	6	1	5	1	8	2	2	2	1	3	2

be observed at Tables 6 and 7 attached. Bovines are the second most abundant species with a total of 138 remains (cranial and axial elements, bones from anterior and posterior appendicular skeleton) unearthed in both ditches, from which three are undoubtedly from *Bos taurus* and 10 from *Bos primigenius*. The MNI for bovines is 13 (eight from ditch 1 and five from ditch 2). Finally, the age of death indicates that the bovine individuals are adults (+ 30 months). The establishment of more specific ages through the teeth was not possible due to the absence of mandibles with dental elements.

3.2.6. Caprines: Sheep and/or goat (*Ovis aries* and *Capra hircus*, Linnaeus 1758)

Caprines present a total of 209 fragments (cranial and axial elements, bones from anterior and posterior appendicular skeleton were observed), from which it was possible to classify 10 as sheep and 16 as goat (both species identified in the two ditches). The MNI is 19, 14 coming from ditch 1 and five from ditch 2. Based on the studies of Silver (1969), Payne (1973), Barone (1976), Grant (1982), and Zeder (2006), caprine remains from Barranco do Xacafre are all adult individuals (+ 30 months).

3.3. Bone surface modifications

Four types of anthropic alterations were observed in Barranco do Xacafre: cut marks, fractures with spiral morphology, percussion notches and thermo-alteration by fire (Figs. 3a to 3c). The number of cut marks is not significant, as these are only observable in five bones: a mandible and a femur of *Equus* sp.; two humerus of *Bos primigenius* and one in a cuboid-navicular of *Bos* sp. (Tab. 4) featuring long and deep striae and also short and light striae. Cutmarks on the base of the mandible could be related with skinning. The other cutmarks are related to skeleton disarticulation processes, and more likely to meat removal, due the presence of this marks in the long bone midshaft (Almeida 2017). Regarding fractures with a spiral morphology, these are one of the most common types of marks observed in the collection (35 remains, namely cattle and aurochs, equids, red deer, sheep and/or goat and medium and large-sized animals). These remains belong to the anterior and posterior appendicular skeleton. The presence of these marks may indicate the exploitation of bone narrow, especially in the cases that simultaneously show evidence of percussion notches. Percussion notches were observed in 11 bones from red deer, equids, bovines and caprines, either from medium or large-sized animals. These remains belong mostly to the anterior and posterior appendicular skeleton, although they are also present in the axial skeleton.

Finally, there are 38 remains with thermo-alteration due to fire, which belongs to red deer, caprines, bovines, equids and medium and large-sized animals, mostly

TABLE 3 MINIMUM NUMBER OF INDIVIDUALS (MNI)

	DITCH 1							DITCH 2					
Taxon	100	200	203	001	002	Total	% Total	300	302	303	003	Total	% NISP
Canis familiaris	–	–	–	–	–	0	0,00%	–	–	1	–	1	6,25%
Equus sp.	2	3	3	1	1	10	20,00%	1	1	1	1	4	25,00%
Sus sp.	1 + (1)	1	1	–	1	5	10,00%	–	–	–	–	0	0,00%
Cervus elaphus	4	2	2	2	1	11	22,00%	–	–	1	1	2	12,50%
Capreolus capreolus	–	1	–	–	–	1	2,00%	–	–	–	–	0	0,00%
Bos sp.	3	1	3	1	1	9	18,00%	–	2	1	1	4	25,00%
Ovis aries/ Capra hircus	3	3	2	4	2	14	28,00%	–	1	2	2	5	31,25%
Total	14	11	11	8	6	50	100,00%	1	4	6	5	16	100,00%

In parentheses, the estimated number of young adult individuals

from the axial skeleton but with some cases from the cranial and appendicular skeleton as well. These bones display mostly a black colouration (stage 3 of thermo-alteration, according to Shipman – Foster – Schoeninger 1984). The studied collection is also composed of four remains of brown colour (stage 2), three of grey (stage 4) and five of white colouration (stage 5). In addition, some fragments are in an intermediate stage between phases 2 and 3, showing both brown and black colours. The majority of these elements are completely burned. These bones are probably the result of two types of activity: indirect and direct exposure of carcasses to fire, which can be related to the preparation of meals (brown and black colouration) and throwing bones and teeth into the fireplaces (grey and white colours). Moreover, bone modifications caused by natural agents (post-depositional processes) were also identified. Evidence of weathering has only been registered in seven bones. The impact of terrestrial gastropods and roots on the surface of bone elements is also scarce (12 remains). These modifications are only identified in ditch 1. On the other hand, bones with evidence of fragmentation (post depositional fractures) are more common, with a total of 45 fragments, coming from both ditches, although there is a larger concentration of these elements in ditch 2 (particularly in SU 303). Regarding bone modification caused by chemical agents, the remains that display marks of precipitation of calcium carbonate are significant. Indeed, most of the superficial areas of these bones contain concretions. Contrastingly, fragments with marks of manganese oxide precipitation are reduced. Finally, recent fragmentation of some bones, caused by excavation work were also observed.

3.4. Malacological Fauna

The analysis of invertebrates (molluscs) of this archaeological site allowed the identification of a scarce number of bivalves that are quite fragmented (Figs. 3d and 3e). Invertebrates represent only 2% of the observed faunal collection. This group is composed of four species, namely scallop (*Pecten maximus*), clam (*Ruditapes decussata*), mussel (*Mytilus* sp.) and smooth clam (*Callista chione*). In total, 32 remains were observed, 29 of which allowed identification: 18 correspond to scallop (MN I= 4), seven to clam (MNI = 2), three to mussel (MNI = 3) and one to smooth clam (MNI = 1). All these fragments are from ditch 1, except a single fragment of mussel, which is from ditch 2 (Tab. 5). Though none of the malacological remains display signs of anthropic manipulation, concretions were verified in several remains.

TABLE 4 OSTEOLOGICAL REMAINS WITH ANTHROPIC MODIFICATIONS

		CUTMARKS				PUNCTURE							SPIRAL FRACTURE									THERMO-ALTERATION					
	S. Units	EQ	B	BPR	Total	EQ	CEE	B	O/C	MSA	LSA	Total	EQ	CEE	BTA	BPR	B	O/C	MSA	LSA	Total	CEE	B	O/C	MSA	LSA	Total
DITCH 1	100	–	1	–	1	–	–	1	1	–	1	3	1	3	1	1	1	1	–	1	9	–	–	2	2	7	11
	200	1	–	–	1	1	2	–	–	2	1	6	4	–	–	–	2	–	1	6	13	2	–	–	8	2	12
	203	–	–	1	1	–	–	–	–	–	–	0	1	–	–	1	4	–	–	–	6	1	1	–	1	3	6
	001	–	–	–	0	–	–	–	–	–	–	0	–	1	–	1	–	–	–	1	3	–	–	–	–	–	0
	002	–	–	–	0	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–	0	–	–	–	5	–	5
	Total	1	1	1	3	1	3	1	1	2	2	10	6	4	1	3	7	1	1	8	31	3	1	2	16	12	34
DITCH 2	300	–	–	–	0	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	0	–	–	–	–	–	0
	302	–	–	–	0	–	–	–	–	–	–	0	–	–	–	–	–	–	–	–	0	–	–	–	1	–	1
	303	1	–	1	2	–	–	–	–	–	–	0	–	1	1	–	–	–	–	–	2	–	–	–	2	–	2
	003	–	–	–	0	–	–	–	–	–	–	0	–	–	–	–	1	–	1	–	2	–	–	–	–	–	0
	Total	1	0	1	2	1	0	0	0	0	0	1	0	1	1	0	1	0	1	0	4	0	0	0	3	0	3

Equus sp. (EQ); *Cervus elaphus* (CEE); Bos sp. (B).; *Bos taurus* (BTA); *Bos primigenius* (BPR); *Ovis aries/Capra hircus* (O/C); medium sized animals (MSA); large sized animals (LSA).

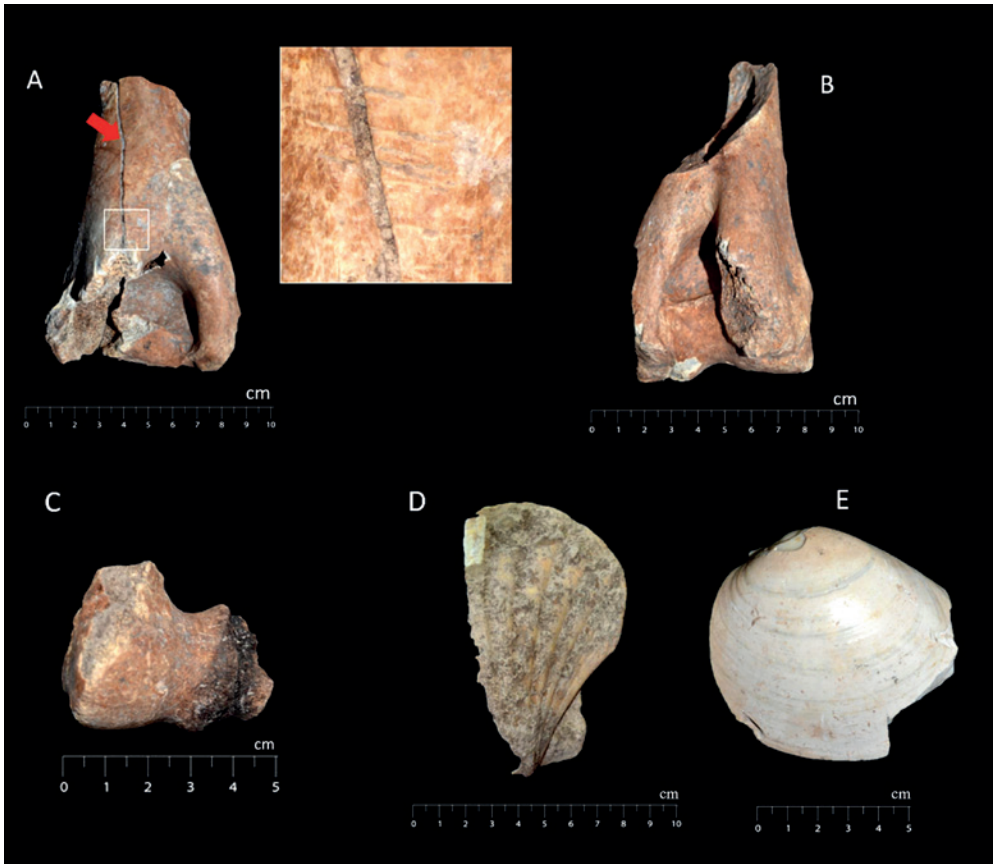

FIG. 3 **a)** Distal humerus of *Bos primigenius* with cut marks; **b)** Distal humerus of *Bos* sp. with spiral fracture; **c)** Distal humerus of *Cervus elaphus* with thermo-alteration by fire; **d)** Fragment of *Pecten maximus*; **e)** Fragment of *Callista chione*.

TABLE 5 GENERAL QUANTIFICATION OF MALACOLOGICAL REMAINS

	DITCH 1												DITCH 2			
S. units	100		200		203		001		002		Total NISP	TOTAL MNI	003		Total NISP	TOTAL MNI
Taxon	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI			NISP	MNI		
Mytilus sp.	1	1	–	–	1	1	–	–	–	–	4	2	1	1	1	1
Pecten maximus	6	1	–	–	5	1	2	1	5	1	22	4	–	–	–	–
Callista Chione	–	–	1	1	–	–	–	–	–	–	2	1	–	–	–	–
Ruditapes decussata	2	1	5	1	–	–	–	–	–	–	9	2	–	–	–	–
Total	9	3	6	2	6	2	2	1	5	1	37	9	1	–	1	1
Non-determined	–	–	1	–	–	–	1	–	1	–	3	–	–	–	–	–
Total ND	–	–	1	–	–	–	1	–	1	–	3	–	–	–	–	–
TNR invertebrates	9	–	7	–	6	–	3	–	6	–	31	–	1	1	1	1

4. DISCUSSION

The faunal remains from Barranco do Xacafre revealed the coexistence of wild and domestic species, similar to what has been noticed in other archaeological sites from the Late Neolithic period (as will be discussed ahead), indicating that the animal exploitation practiced by this community was simultaneously based on pastoralism and hunting activities. Cervids are the principal species being hunted, especially the red deer. Roe deer is also present but represented only by fragments of antlers. This fact is uncommon but occurs in the Monte das Cabeceiras 2 ditched enclosure (Almeida – Cerrillo-Cuenca – Saladié 2021). It can

therefore be plausible to assume that these antlers were probably gathered in nature, possibly for the manufacture of tools, or can function as trophies, for instance, especially due the absence of the burr portion. Indeed, this activity did not require the slaughter of the animal, as the antlers of roe deer fall off during autumn to regrow in the following spring. However, although it seems improbable, the hypothesis that the identified individual would have been hunted for meat consumption is not completely discarded. Comparatively, the red deer is represented by all parts of the skeleton. The identified remains belong to adult individuals, which can be related to the fact that this animal presents a high nutritional value. The presence of remains with spiral fractures and percussion notches may indicate the use of the bone marrow of this species. In addition to the antlers, the skin could also be used.

Regarding equids, it was not possible to assess their domesticity status. The abundance of equids is not common in contexts dating from the Late Neolithic. So, what can justify this abundance? The most plausible option that may explain this representativeness is that wild horses would be easily available, perhaps at a certain time or for some reason, possibly leading to an increase in the hunting of this species. Furthermore, a recent genomic study (Librado *et al.* 2024) reveals that the proliferation of domestic horse in Europe was started at the end of the 3rd millennium BC. In fact, there are not evidences of the domestication of this specie during Neolithic in current Portuguese territory. To provide a clearer perspective on this topic, it would be interesting to undertake some genetic analyses, for instance, to assess the domesticity status of these equids. The presence of remains with anthropic marks could indicate the consumption of their meat, and/or perhaps the use of their skins and/or tendons. Following this topic, it might also be noteworthy the absence of anthropic marks in the swine remains analysed in this study. The vast presence of concretions on swine bones could explain this fact, since this difficult the observation of bone surface. Also, the scarce presence of swine remains does not allow a good discussion about this question. Taking into account that one lower-third molar was identified as wild boar, perhaps this can explain the reduced number of swine bones as, eventually, the human communities of Barranco do Xacafre would not be able to breed pigs. However, it must be stressed that this analysis is based on only one tooth and, as such, renders this hypothesis rather debatable. The presence of wild boar demonstrates that not only the cervids were hunted.

Considering the bovines, it was possible to identify anatomical elements of cattle and aurochs in both ditches, with the aurochs being prevalent, revealing once again the importance of hunting activities for these communities. The presence of adult individuals certainly indicates the use of meat and other primary products (tendons, bones, horns); however, in the case of cattle, there could be the use of secondary products such as milk and maybe traction. For instance, at Anta 1 de Vale da Laje (Tomar, Estremadura) through the study of organic residues extracted from exhumed pottery, it was possible to confirm the presence not only of carcass fats from both ruminant and non-ruminant, but also dairy fats. The identification of dairy fats confirms the exploitation not only of the meat, but also the use of milk during Neolithic period in the current Portuguese territory (Stojanovski *et al.* 2020). Several anthropic marks were observed in bovine remains evidencing the use of bone marrow. Caprines (sheep and goat) are the prevalent domestic species. The mortality pattern indicates that these individuals were slaughtered as adults, which may indicate the use of their secondary products, such as milk and wool (in the case of sheep) for some time, and only then subsequently slaughtered. Spiral fractures and impact notches were recorded in some remains.

To conclude on mammals, dog remains are scarce in our sample. In this period, dogs had an uncertain status, although it could be assumed that the dog would been used in hunting activities. The absence of small mammals, particularly leporids, is not common, nevertheless, in this case, it must be stressed that the deposits excavated during the archaeological intervention that originated our sample were not sieved and, thus, smaller bones could have been missed.

Regarding the malacological fauna, there was a reduced presence of bivalves originating in both coastal and estuarine environments, such as mussels, scallops, clams and smooth clams. These molluscs were probably collected on oceanic coastline and the Sado River estuary, which are the closest sources where they could have been gathered. In fact, molluscs do not

seem to have a relevant role in terms of subsistence, which may correspond to a punctual collection.

Other archaeological sites from the Late Neolithic period located in what is now the Portuguese territory have already been the subject of zooarchaeological studies, namely in Alentejo region and Portuguese Estremadura. In Spanish Extremadura, only one site with Late Neolithic occupation was the subject of this kind of study.

For Alentejo the sites with zooarchaeological studies are the following: Juromenha (Valente 1998 – Juromenha 1; Mataloto *et al.* 2018 – Juromenha 2), Perdigões – several contexts in the sectors Q (Cabaço 2010) – Perdigões 1 and I (Costa 2013; – Perdigões 2 Costa 2018 – Perdigões 3), Ponte da Azambuja 2 (Nabais – Rodrigues 2017), Moinho de Valadares (Valente 2013), Igreja de São Jorge (Cardoso 1994) and Monte da Contenda (Valera – Becker – Costa 2014). Regarding Portuguese Estremadura, a few zooarchaeological studies have also been developed, namely Carrascal (Cardoso 2009), Leceia (Cardoso – Detry 2001/2002), Penedo do Lexim (Moreno-García – Sousa 2013), Espargueira/ Serra das Éguas (Encarnação – Almeida 2017), Lapiás das Lameiras (Davis *et al.* 2018), and Belas/ Vale de Lobos (Davis – Gabriel – Simões 2018). Finally, for Spanish Extremadura, data is merely available for Los Barruecos site, a settlement from Malpartida de Cáceres (Almeida *et al.* 2021). However, for the Chalcolithic period, for this region, there are several settlements with zooarchaeological data that must be mentioned, such as, Cerro I de los Castillejos de Fuente de Cantos, in Badajoz (Castaños Ugarte 1994) and Cerro de la Horca (Castaños Ugarte 1992); Atalaya de Torrequemada (Rodriguez-Hidalgo – García Cabezas 2011); Cabrerizas and Castrejón (González Cordero 2011) located in Cáceres district, among other sites (see González Cordero 2011).

For Alentejo the presented sites are frequently associated with fertile soils or strategic positions that dominate the surrounding landscape (Valente – Carvalho 2019) and the majority were ditched enclosures, such as Juromenha (Alandroal), Perdigões (Reguengos de Monsaraz), Ponte da Azambuja 2 (Portel, Évora), Moinho de Valadares (Mourão) and Monte da Contenda (Arronches, Portalegre). Igreja de São Jorge remains are from a seemingly isolated rock-cut negative structure (Cardoso 1994; Valera 2000; Rodrigues 2015). For Portuguese Estremadura, sites all are from Lisbon district. Carrascal and Leceia (Oeiras); Penedo do Lexim (Mafra) are fortified settlements and Espargueira/ Serra das Éguas (Amadora); Lapiás de Lameiras and Belas/Vale de Lobos (Sintra) are settlements (Espargueira/ Serra das Éguas – Amadora; Lapiás de Lameiras and Belas/Vale de Lobos (Sintra). In terms of faunal quantification, bovines and swine are present in all of these sites. Caprines are only absent in Monte da Contenda. Bovine remains varies between 2% in Penedo do Lexim to 67% in Carrascal. In general, the presence of *Bos taurus* and *Bos primigenius* have been recorded, however, unlike in Barranco do Xacafre and Cerro I, the domesticated species are predominant.

Swine remains do not exceed 2% in Barranco do Xacafre, however, are significative both in Alentejo and Estremadura. The highest abundance of swine occurs in Los Barruecos (62%), Perdigões (59%), Penedo do Lexim (49%), Juromenha and Ponte da Azambuja 2 (both with 47%), Leceia (38%). In Cabrerizas swine represents 26% of the NISP, corresponding to a fourth of the domestic species. In Barranco do Xacafre, caprines are the predominant species (37%). In Estremadura they correspond the largest group in Lameiras (60%), Belas/Vale de Lobos (51%) and Espargueira/ Serra das Éguas (42%). On the other hand, in Alentejo, caprines are the largest group in Igreja de São Jorge (48%) and Moinho de Valadares (34%) and are absent in Monte da Contenda. Regarding Spanish Extremadura, caprines are the prevalent species in Atalaya de Torrequemada and Cerro de la Horca both with 27%. Cervid bones, mostly from *Cervus elaphus*, are absent in Carrascal and are rare in mostly of these sites. Notwithstanding, they are significative in Moinho de Valadares (32%), Monte da Contenda (27%), Cabrerizas (26%) and in Castrejón (21%), where are the second most relevant group. In Barranco do Xacafre cervids corresponds to 18%, as well in Cerro de la Horca and Cerro I, with the same percentage.

The presence of equids is also non-significative in Alentejo, in frequences lower than 5%, with exception of Barranco do Xacafre (18%) and Monte da Contenda (19%). In Portuguese Estremadura they are absent. Regarding Spanish Extremadura, the presence of equid bones is more pronounced, reaching 40% in Castrejón. Leporids are especially abundant in Penedo do Lexim (38%) and Juromenha 1 (24%). The presence

of carnivores (dog, wolf, fox, Iberian lynx and others) in these sites is reduced. In addition to the studies mentioned above, it is important to refer the study of the faunal remains from Chalcolithic settlements of Cabezo Juré; La Junta de Los Ríos, Huelva and Valencina de La Concepción, Sevilla (Abril López 2012). Despite these sites are located in Andalusia, they share similar physical and bioclimatic characteristics, thus offering valuable comparative information. In these sites, swine are the predominant species. In Valencina de La Concepción these reach to 53,9%. Caprines are in Cabezo Juré and in Valencina de La Concepción the second most abundant group (26% and 22%, respectively). Regarding cervids, they are the most common species in Junta de Los Ríos (51%), and are also abundant in Cabezo Juré (27%). In Valencina de La Concepción they are reduced (1,5%). Bovine remains have a variation between 17,1% in Valencina de La Concepción and 3,6% in Junta de Los Ríos. Leporids reach 15,4% in Junta de Los Ríos; 8,4% in Cabezo Juré and 4,9% in Valencina de La Concepción. Finally, the presence of equids is scarce, less than 5% in all these sites. Considering all this evidence, the collection analysed in this study presents some distinctive trends when compared with the sites mentioned above, namely regarding the abundance of equids and bovines, and the small representativity of swine. This difference might eventually be related to ecosystem factors (e.g., availability of different animals in the same region), related perhaps to different strategies of management of livestock and hunting, to the type of site and the specificities of the contexts or even with variability of human behaviour in this area during some specific part of this period, which reflected in the faunal assemblage.

5. CONCLUSIONS

Despite some limitations, the study of the faunal assemblage unearthed at Barranco do Xacafre provided some rather interesting results, as this assemblage revealed some distinctive trends when compared with other known contexts from the Alentejo region, dated from of the Late Neolithic period. This difference is noted especially on the abundance of bovines and equids, the scarcity of swine and the absence of leporids, unusual characteristics in similar archaeological contexts. Concomitantly, the importance of both wild and domestic species is attested, as well as the occasional collection of molluscs, indicating animal exploitation strategies based simultaneously on hunting and pastoralism. Regarding the age of death of mammals, all identified individuals are adults (except for one young adult swine) and this evidence may indicate not only the consumption of these species but also the use of other primary products (e.g., tendons, bones, horns). Bovines, on the other hand, could have been used for secondary products, such as milk, and even perhaps as a driving force for transportation or fieldwork, although the current data does not allow any further certainty about such possibilities. The presence of anthropic marks namely in some remains of equids, cervids, bovines and caprines also indicates the consumption of these species. To conclude, considering the distribution of the assemblage, it is important to mention the abundance of faunal remains in ditch 1, a stark contrast with ditch 2. This difference seems to be directly related to the variability of anthropic depositions, particularly considering that both ditches seem to have undergone similar post-depositional processes.

When considering all these hypotheses and interpretations, it is still important to note that the current study faced some limitations, namely the fact that both ditches have not been completely excavated, the abundance of concretions in the surface of bones, which renders the process of identification more difficult, and, finally, the absence of radiocarbon dating. Nevertheless, this study provides a relevant contribution to a better understanding of the relationship between human communities and animals in a period of significative transformations, adding to the current knowledge of the Neolithic period in this region.

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ANNEXES

TABLE 6 OSTEOMETRIC DATA (VALUES IN MILLIMETRES). MEASUREMENTS ACCORDING TO DRIESCH 1976 AND DAVIS 2002

Tax.	Anat.	GL	GLl	GB	Bp	Dp	Bd	GLm	Dl	BT	HTC	WCM	DEM	WCL	DEL	SD	SLC	GPL	DPA	SDO
EQ	RA	–	–	–	–	–	64,8	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	RA	–	–	–	56,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	RA	–	–	–	–	–	92,2	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	RA	–	–	–	–	–	58,6	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	FE	–	–	–	–	–	75,2	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	TI	–	–	–	72,6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	TI	–	–	–	665	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	TI	–	–	–	–	–	57,9	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	TI	–	–	–	–	–	50,4	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	AS	–	53,3	49,7	–	–	46,6	48,6	–	–	–	–	–	–	–	–	–	–	–	–
EQ	AS	–	55	58,8	–	–	52,6	50,2	–	–	–	–	–	–	–	–	–	–	–	–
EQ	CA	97,7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	CA	98,8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	CA	86,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	CA	91,5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	MTS	–	–	–	–	–	41,6	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	MTS	–	–	–	–	–	42,6	–	–	–	–	–	–	–	–	–	–	–	–	–
EQ	P1	78,7	–	–	38,6	46,3	36,8	–	–	–	–	–	–	–	–	34,1	–	–	–	–
EQ	P1	76,4	–	–	39,6	30,7	38,8	–	–	–	–	–	–	–	–	30,8	–	–	–	–
EQ	P1	75,1	–	–	50,4	37	36,8	–	–	–	–	–	–	–	–	31,4	–	–	–	–
EQ	P1	77,7	–	–	453	33,2	/	–	–	–	–	–	–	–	–	32,5	–	–	–	–
EQ	P2	43,3	–	–	464	31,6	41,8	–	–	–	–	–	–	–	–	42,1	–	–	–	–
EQ	P2	40,7	–	–	46,6	30,1	39,2	–	–	–	–	–	–	–	–	37,5	–	–	–	–
S	P1	35,6	–	–	17,9	16,7	17,1	–	–	–	–	–	–	–	–	15,2	–	–	–	–
S	P2	33,5	–	–	14,7	–	12,8	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	48,3	–	–
CEE	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	47,4	–	–
CEE	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	53,2	–	–
CEE	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	28,7	47,7	–	–
CEE	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	37,2	53,7	–	–
CEE	HU	–	–	–	–	–	44,8	–	–	42,7	24,5	–	–	–	–	–	–	–	–	–
CEE	HU	–	–	–	–	–	42,3	–	–	39,8	23,7	–	–	–	–	–	–	–	–	–

TABLE 6 OSTEOMETRIC DATA (VALUES IN MILLIMETRES). MEASUREMENTS ACCORDING TO DRIESCH 1976 AND DAVIS 2002

Tax.	Anat.	GL	GLl	GB	Bp	Dp	Bd	GLm	Dl	BT	HTC	WCM	DEM	WCL	DEL	SD	SLC	GPL	DPA	SDO
CEE	HU	–	–	–	–	–	46,8	–	–	42,2	25,5	–	–	–	–	–	–	–	–	–
CEE	HU	–	–	–	–	–	44,2	–	–	–	25,4	–	–	–	–	–	–	–	–	–
CEE	HU	–	–	–	–	–	68,5	–	–	42,1	24,7	–	–	–	–	–	–	–	–	–
CEE	HU	–	–	–	–	–	–	–	–	42,5	24,4	–	–	–	–	–	–	–	–	–
CEE	RA	–	–	–	–	–	45,2	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	RA	–	–	–	45,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	RA	–	–	–	–	–	38,5	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	49,7	47,7
CEE	UL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50	47,8
CEE	FE	–	–	–	–	–	61,4	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	TI	–	–	–	–	–	42,2	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	TI	–	–	–	–	–	41,6	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	TI	–	–	–	–	–	42,4	–	–	–	–	–	–	–	–	–	–	–	–	–
CEE	AS	–	48,5	–	–	–	28,9	45,1	28,7	–	–	–	–	–	–	–	–	–	–	–
CEE	AS	–	49,5	–	–	–	31,8	45,9	27,3	–	–	–	–	–	–	–	–	–	–	–
CEE	AS	–	48,6	–	–	–	30,4	46,6	28,6	–	–	–	–	–	–	–	–	–	–	–
CEE	P1	51,7	–	–	19,2	23,9	17,6	–	–	–	–	–	–	–	–	14,5	–	–	–	–
CEE	P2	37,7	–	–	17,7	23,5	14,7	–	–	–	–	–	–	–	–	13,6	–	–	–	–
CEE	P2	36,3	–	–	17,7	33,4	15,1	–	–	–	–	–	–	–	–	13,5	–	–	–	–
CEE	P2	36,5	–	–	18,4	23,7	15,8	–	–	–	–	–	–	–	–	13,4	–	–	–	–
BTA	HU	–	–	–	–	–	68,5	–	–	68,1	33,6	–	–	–	–	–	–	–	–	–
BTA	MTC	–	–	–	–	–	59,7	–	–	–	–	27,7	26,5	27,2	26,1	–	–	–	–	–
BTA	AS	–	64,5	–	–	–	40,7	58	31,9	–	–	–	–	–	–	–	–	–	–	–
B	AX	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BPR	HU	–	–	–	–	–	86	–	–	89,1	46,2	–	–	–	–	–	–	–	–	–
BPR	HU	–	–	–	–	–	86	–	–	88,4	45,9	–	–	–	–	–	–	–	–	–
BPR	HU	–	–	–	–	–	83,2	–	–	83,2	43,2	–	–	–	–	–	–	–	–	–
BPR	MTS	–	–	–	–	–	82,1	–	–	–	–	38,4	34,4	36,7	31,2	–	–	–	–	–
BPR	P1	73,7	–	–	39,2	46,5	35,2	–	–	–	–	–	–	–	–	35,8	–	–	–	–
BPR	P1	73,5	–	–	43,9	48,2	37,7	–	–	–	–	–	–	–	–	36,9	–	–	–	–
BPR	P2	53,5	–	–	41,2	447	36,7	–	–	–	–	–	–	–	–	32,8	–	–	–	–
BPR	P2	54,2	–	–	39,8	454	33,8	–	–	–	–	–	–	–	–	36	–	–	–	–

TABLE 6 OSTEOMETRIC DATA (VALUES IN MILLIMETRES). MEASUREMENTS ACCORDING TO DRIESCH 1976 AND DAVIS 2002

Tax.	Anat.	GL	GLI	GB	Bp	Dp	Bd	GLm	DI	BT	HTC	WCM	DEM	WCL	DEL	SD	SLC	GPL	DPA	SDO
BPR	P2	50,8	–	–	40,6	–	34,2	–	–	–	–	–	–	–	–	–	–	–	–	–
BPR	P2	54,4	–	–	39	44,6	30,4	–	–	–	–	–	–	–	–	32	–	–	–	–
B	HU	–	–	–	–	–	76,9	–	–	72,8	33,5	–	–	–	–	–	–	–	–	–
B	MTC	–	–	–	–	–	64,9	–	–	–	–	32,9	28,6	31,5	28,7	–	–	–	–	–
B	MTS	–	–	–	–	–	68,7	–	–	–	–	32,2	29,5	29	27	–	–	–	–	–
B	MTS	–	–	–	–	–	66,7	–	–	–	–	31,1	28,7	–	25,2	–	–	–	–	–
B	MTS	–	–	–	–	–	65,5	–	–	–	–	31,5	29,1	28,9	25,8	–	–	–	–	–
B	MTS	–	–	–	–	–	62,3	–	–	–	–	29,2	28,4	–	–	–	–	–	–	–
B	P1	72,4	–	–	34,3	39,6	31,7	–	–	–	–	–	–	–	–	21,8	–	–	–	–
B	P1	65,7	–	–	31,9	38,7	29	–	–	–	–	–	–	–	–	27,2	–	–	–	–
B	P1	–	–	–	34,8	42,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
B	P1	–	–	–	–	–	34,5	–	–	–	–	–	–	–	–	–	–	–	–	–
B	P2	44,6	–	–	35,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
B	P2	43,2	–	–	34,1	36,4	28.2	–	–	–	–	–	–	–	–	27,2	–	–	–	–
OA	RA	–	–	–	29	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
OA	RA	–	–	–	31,5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CH	HU	–	–	–	–	–	–	–	–	31,8	16,2	–	–	–	–	–	–	–	–	–
CH	RA	–	–	–	–	–	27,5	–	–	–	–	–	–	–	–	–	–	–	–	–
O/C	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33,5	–	–
O/C	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33,1	–	–
O/C	SC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33,4	–	–

Equus sp. (EQ); *Sus* sp. (S); *Cervus elaphus* (CEE); *Bos taurus* (BTA); *Bos primigenius* (BPR); *Bos* sp. (B); *Ovis aries* (OA); *Capra hircus* (CH); *Ovis aries/Capra hircus* (O/C). Axis (AX); Scapula (SC); Humerus (HU); Radio (RA); Ulna (UL); Metacarpal (MTC); Femur (FE); Tibia (TI); Astragalus (AS); Calcaneus (CA); Metatarsal (MTS); Phalanx 1 (P1); Phalanx 2 (P2).

TABLE 7 ODONTOMETRIC DATA. (VALUES IN MILLIMETRES).
MEASUREMENTS ACCORDING TO DRIESCH 1976; PAYNE – BULL (1988) AND ALBARELLA *ET AL*. (2005)

TAXON	ANAT.	ELEMENTS	(B)	(L)	WA	WC	WP
CF	Tooth	Lower canine	5,6	8,6	–	–	–
CF	Tooth	Lower canine	5,8	8,6	–	–	–
CF	Mand.	Lower Molar 1	8,1	18,7	–	–	–
CF	Mand.	Lower Molar 2	5,4	6,5	–	–	–
CF	Mand.	Lower Molar 3	3,3	3,9	–	–	–
CF	Mand.	Lower Pre Molar 1	4,2	7,7	–	–	–
CF	Mand.	Lower Pre Molar 2	4,6	9,3	–	–	–
EQ	Tooth	Incisive 1	10,4	16,6	–	–	–
EQ	Tooth	Incisive 2	10,3	16,5	–	–	–
EQ	Tooth	Incisive 2	10,3	15,9	–	–	–
EQ	Tooth	Lower Molar 1/ 2	14,3	26,8	–	–	–
EQ	Tooth	Lower Molar 3	15,8	30,3	–	–	–
EQ	Tooth	Lower Molar 3	15,8	30,5	–	–	–
EQ	Tooth	Lower M3	15,6	28,7	–	–	–
EQ	Tooth	Lower M3	12,6	22,8	–	–	–
EQ	Tooth	Lower M3	12,4	26,1	–	–	–
EQ	Tooth	Lower Pre molar 3/ 4	11,6	23,5	–	–	–
EQ	Tooth	Upper Molar 1/ 2	24,3	26,2	–	–	–
EQ	Tooth	Upper Molar 1/ 2	24,2	24,6	–	–	–
EQ	Tooth	Upper Molar 1/ 2	25,5	26,9	–	–	–
EQ	Tooth	Upper Molar 1/ 2	23,9	23,7	–	–	–
EQ	Tooth	Upper Molar 1/ 2	25,1	26,2	–	–	–
EQ	Tooth	Upper Molar 1/ 2	23,9	24,9	–	–	–
EQ	Tooth	Upper Molar 1/ 2	24,8	27	–	–	–
EQ	Tooth	Upper Molar 1/ 2	24,8	23,8	–	–	–
EQ	Tooth	Upper Molar 1/ 2	25,1	25,7	–	–	–
EQ	Tooth	Upper Molar 1/ 2	26,2	26,9	–	–	–
EQ	Tooth	Upper Molar 1/ 2	23,6	24,3	–	–	–
EQ	Tooth	Upper Molar 3	22,8	30,9	–	–	–
EQ	Tooth	Upper Molar 3	22,7	34,5	–	–	–
EQ	Tooth	Upper Molar 3	23,2	35,2	–	–	–
EQ	Mand.	Lower Incisive 1	8,9	16,1	–	–	–
EQ	Mand.	Lower Incisive 2	9,1	15,2	–	–	–
EQ	Mand.	Lower Incisive 3	9,3	13,9	–	–	–

TABLE 7 ODONTOMETRIC DATA. (VALUES IN MILLIMETRES).
MEASUREMENTS ACCORDING TO DRIESCH 1976; PAYNE – BULL (1988) AND ALBARELLA *ET AL*. (2005)

TAXON	ANAT.	ELEMENTS	(B)	(L)	WA	WC	WP
EQ	Mand.	Lower Incisive 3	9,3	14,2	–	–	–
EQ	Mand.	Lower Incisive 2	9,3	15,1	–	–	–
EQ	Mand.	Lower Incisive 2	8,5	16,2	–	–	–
EQ	Mand.	Lower Incisive 1	9,3	19,2	–	–	–
EQ	Mand.	Lower Incisive 2	9,8	17,2	–	–	–
EQ	Mand.	Lower Molar 3	14,5	29,1	–	–	–
EQ	Mand.	Lower Molar 3	16,5	30,1	–	–	–
SS	Tooth	Lower Molar 3	16,4	41,3	16,4	16,6	14,4
S	Tooth	Lower Molar 2	14,6	25,3	13,5	–	15,2
S	Mand.	Lower Molar 2	11,5	19,3	11,1	–	–
CEE	Tooth	Upper Incisive	6,7	8,4	–	–	–
CEE	Tooth	Lower Molar 1/2	13,7	22,7	–	–	–
CEE	Tooth	Lower Molar 1/2	13,1	22,2	–	–	–
CEE	Tooth	Lower Molar 1/2	11	18,7	–	–	–
CEE	Tooth	Lower Molar 1/2	6,1	6,9	–	–	–
CEE	Tooth	Lower Molar 3	12,7	29,5	–	–	–
CEE	Tooth	Lower Pre Molar 1	6,4	9,3	–	–	–
CEE	Tooth	Lower Pre Molar 3	10,3	18,1	–	–	–
CEE	Tooth	Lower Pre Molar 4	13,1	21,6	–	–	–
CEE	Tooth	Upper Molar 1/2	17,5	24,3	–	–	–
CEE	Tooth	Upper Molar 1/2	18,7	23,5	–	–	–
CEE	Tooth	Upper Molar 1/2	15,4	25,1	–	–	–
CEE	Mand.	Lower Molar 1	13,3	21,6	–	–	–
CEE	Mand.	Lower Molar 1	13,1	21,5	–	–	–
CEE	Mand.	Lower Molar 2	13,3	22,9	–	–	–
CEE	Mand.	Lower Molar 3	13,1	26,7	–	–	–
CEE	Mand.	Lower Molar 3	13,5	28,8	–	–	–
CEE	Mand.	Lower Molar 3	13,6	27,9	–	–	–
CEE	Mand.	Lower Molar 3	13,1	29,4	–	–	–
B	Tooth	Lower incisive	4,6	9,3	–	–	–
B	Tooth	Lower Molar 1/2	12,8	31,2	–	–	–
B	Tooth	Lower Molar 1/2	13,1	31,4	–	–	–
B	Tooth	Lower Molar 1/2	14,9	27,8	–	–	–
B	Tooth	Lower Molar 1/2	14,6	28,4	–	–	–

TABLE 7 ODONTOMETRIC DATA. (VALUES IN MILLIMETRES).
MEASUREMENTS ACCORDING TO DRIESCH 1976; PAYNE – BULL (1988) AND ALBARELLA *ET AL*. (2005)

TAXON	ANAT.	ELEMENTS	(B)	(L)	WA	WC	WP
B	Tooth	Lower Molar 1/2	15,5	28,5	–	–	–
B	Tooth	Lower Molar 3	17,1	37,5	–	–	–
B	Tooth	Upper Molar 1/2	15,9	28,6	–	–	–
B	Tooth	Upper Molar 1/2	15,8	28,8	–	–	–
B	Tooth	Upper Molar 1/2	18,8	30,1	–	–	–
B	Tooth	Upper Molar 1/2	17,8	28,2	–	–	–
B	Tooth	Upper Molar 1/2	18,2	28,1	–	–	–
B	Tooth	Upper Molar 1/2	18,8	30,5	–	–	–
B	Tooth	Upper Molar 1/2	17,2	27,5	–	–	–
B	Tooth	Upper Molar 1/2	18,1	29,9	–	–	–
B	Tooth	Upper Molar 1/2	14,5	32,5	–	–	–
B	Tooth	Upper Molar 1/2	15,7	32,8	–	–	–
B	Tooth	Upper Molar 1/2	24,6	24,9	–	–	–
B	Tooth	Upper Molar 1/2	23,6	24,2	–	–	–
OA	Tooth	Lower Molar 3	9,2	23,1	–	–	–
OA	Tooth	Lower Molar 3	9,3	23,5	–	–	–
OA	Tooth	Lower Molar 3	8,5	24,2	–	–	–
OA	Tooth	Lower Molar 3	7,3	20,4	–	–	–
OA	Tooth	Lower Molar 3	8,4	23,6	–	–	–
OA	Tooth	Lower Molar 3	8,5	21,8	–	–	–
OA	Tooth	Lower Molar 3	9,2	22,6	–	–	–
CH	Tooth	Lower Molar 3	8,7	21,7	–	–	–
CH	Tooth	Lower Molar 3	8,4	22,3	–	–	–
CH	Tooth	Lower Molar 3	9,2	21,5	–	–	–
CH	Tooth	Lower Molar 3	8,9	24,2	–	–	–
CH	Tooth	Lower Molar 3	9,5	24,3	–	–	–
O/C	Tooth	Lower incisive	8,2	7,2	–	–	–
O/C	Tooth	Lower Molar 1/ 2	6,8	13,9	–	–	–
O/C	Tooth	Lower Molar 1/ 2	9,8	14,2	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,9	14,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,9	15,3	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,8	15,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,6	15,4	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,9	14,6	–	–	–

TABLE 7 ODONTOMETRIC DATA. (VALUES IN MILLIMETRES).
MEASUREMENTS ACCORDING TO DRIESCH 1976; PAYNE – BULL (1988) AND ALBARELLA *ET AL*. (2005)

TAXON	ANAT.	ELEMENTS	(B)	(L)	WA	WC	WP
O/C	Tooth	Lower Molar 1/ 2	9,1	13,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	9,1	14,4	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8	15,9	–	–	–
O/C	Tooth	Lower Molar 1/ 2	11,2	15,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,3	14,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,2	13,5	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,8	15,9	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,9	15,1	–	–	–
O/C	Tooth	Lower Molar 1/ 2	10,4	16,1	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,2	13,5	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,8	15,2	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,3	16,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,6	15,3	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,3	16,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,7	14,9	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,3	13,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	9,2	14,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,3	12,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	11,7	15,3	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,1	16,1	–	–	–
O/C	Tooth	Lower Molar 1/ 2	10,2	15,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	9	17,2	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,3	15,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,1	17,3	–	–	–
O/C	Tooth	Lower Molar 1/ 2	8,4	14,6	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,4	14,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,6	15,4	–	–	–
O/C	Tooth	Lower Molar 1/ 2	7,3	12,8	–	–	–
O/C	Tooth	Lower Molar 1/ 2	6,7	12,1	–	–	–
O/C	Tooth	Lower Molar 3	9,4	23,5	–	–	–
O/C	Tooth	Lower Pre Molar 2	6,6	7,1	–	–	–
O/C	Tooth	Lower Pre Molar 3	8,4	7,9	–	–	–
O/C	Tooth	Lower Pre Molar 3	6,3	8,5	–	–	–
O/C	Tooth	Lower Pre Molar 3	7,1	9,4	–	–	–

TABLE 7 ODONTOMETRIC DATA. (VALUES IN MILLIMETRES).
MEASUREMENTS ACCORDING TO DRIESCH 1976; PAYNE – BULL (1988) AND ALBARELLA *ET AL*. (2005)

TAXON	ANAT.	ELEMENTS	(B)	(L)	WA	WC	WP
O/C	Tooth	Upper Molar 1/ 2	12,6	18,7	–	–	–
O/C	Tooth	Upper Molar 1/ 2	12,1	15,9	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,3	15,7	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,6	17,3	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,2	17,7	–	–	–
O/C	Tooth	Upper Molar 1/ 2	10,4	14,2	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,3	16,5	–	–	–
O/C	Tooth	Upper Molar 1/ 2	10,2	16,6	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,7	17,6	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,2	19	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,1	13,2	–	–	–
O/C	Tooth	Upper Molar 1/ 2	12,5	16	–	–	–
O/C	Tooth	Upper Molar 1/ 2	10,7	15,5	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,8	16	–	–	–
O/C	Tooth	Upper Molar 1/ 2	12,5	18,4	–	–	–
O/C	Tooth	Upper Molar 1/ 2	9,9	14,6	–	–	–
O/C	Tooth	Upper Molar 1/ 2	12,9	16,1	–	–	–
O/C	Tooth	Upper Molar 1/ 2	11,5	17,8	–	–	–
O/C	Tooth	Upper Molar 1/ 2	12,6	17,1	–	–	–
O/C	Tooth	Upper Molar 3	11,5	18,6	–	–	–
O/C	Tooth	Upper Molar 3	12,6	18,2	–	–	–
O/C	Tooth	Upper Molar 3	11,8	19,5	–	–	–
O/C	Tooth	Upper Molar 3	12,7	20,1	–	–	–
O/C	Tooth	Upper Molar 3	11,8	19, 1	–	–	–
O/C	Tooth	Upper Molar 3	1,2	19,2	–	–	–
O/C	Tooth	Upper Molar 3	11,7	17,5	–	–	–
O/C	Tooth	Upper Molar 3	11,3	19,1	–	–	–
O/C	Tooth	Upper Molar 3	11,5	19,2	–	–	–
O/C	Tooth	Upper Molar 3	11,3	18,9	–	–	–
O/C	Mand.	Lower Pre Molar 1	6,2	8,7	–	–	–

Canis familiaris (CF); *Equus* sp. (EQ); *Sus scrofa* (SS); *Sus* sp. (S); *Cervus elaphus* (CEE); *Bos* sp. (B); *Ovis aries* (OA); *Capra hircus* (CH); *Ovis aries/Capra hircus* (O/C).

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POLÍTICA EDITORIAL

Objectivos

A Ophiussa – Revista do Centro de Arqueologia da Universidade de Lisboa foi iniciada sob a direcção de Victor S. Gonçalves em 1996, tendo sido editado o volume 0. A partir do volume 1 (2017), a Revista Ophiussa converte-se numa edição impressa e digital da UNIARQ – Centro de Arqueologia da Universidade de Lisboa (ISSN 1645-653X / E-ISSN 2184-173X).

O principal objectivo desta revista é a publicação e divulgação de trabalhos com manifesto interesse, qualidade e rigor científico sobre temas de Pré-História e Arqueologia, sobretudo do território europeu e da bacia do Mediterrâneo.

Periodicidade

A Ophiussa – Revista do Centro de Arqueologia da Universidade de Lisboa publicará um volume anual. O período de submissão de trabalhos decorrerá sempre no primeiro semestre e a edição ocorrerá no último trimestre de cada ano.

Secções da revista

A revista divide-se em duas secções: artigos científicos e recensões bibliográficas. Excepcionalmente poderão ser aceites textos de carácter introdutório, no âmbito de homenagens ou divulgações específicas, que não serão submetidos à avaliação por pares. Isentas desta avaliação estão também as recensões bibliográficas.

Os autores / editores que pretendam apresentar uma obra para recensão devem enviar dois exemplares para a direcção da Revista Ophiussa: um para o autor/autora da recensão que será convidado para o efeito e outro para a Biblioteca da Faculdade de Letras da Universidade de Lisboa. Aceita-se igualmente a apresentação de propostas de recensões espontâneas.

Aceitam-se trabalhos redigidos em português, inglês, espanhol, italiano e francês.

Processo de avaliação por pares

Os artigos submetidos são sujeitos a um processo de avaliação por parte de revisores externos (double blind peer review).

Todas as submissões (artigos e recensões) serão avaliadas, em primeira instância, pela Coordenação Editorial, no que respeita ao seu conteúdo formal e à sua adequação face à política editorial e às normas de edição da revista. Os artigos que cumprirem estes requisitos serão posteriormente submetidos a um processo de avaliação por pares cega / double blind peer review (mínimo de dois revisores). O Conselho Científico, constituído pela direcção da UNIARQ e por investigadores externos, acompanhará o processo de edição.

Esta etapa será concretizada por investigadores externos qualificados, sendo os respectivos pareceres entregues num período não superior a três meses. Os revisores procederão à avaliação de forma objectiva, tendo em vista a qualidade do conteúdo da revista; as suas críticas, sugestões e comentários serão, na medida do possível, construtivos, respeitando as capacidades intelectuais do(s) autor(es). Após a recepção dos pareceres, o(s) autor(es) tem um prazo máximo de um mês para proceder às alterações oportunas e reenviar o trabalho.

A aceitação ou recusa de artigos terá como únicos factores de ponderação a sua originalidade e qualidade científica.

O processo de revisão é confidencial, estando assegurado o anonimato dos avaliadores e dos autores dos trabalhos, neste último caso até à data da sua publicação.

Os trabalhos só serão aceites para publicação a partir do momento em que se conclua o processo da revisão por pares. Os textos que não forem aceites serão devolvidos aos seus autores.

A lista dos avaliadores será publicada em ciclos de 3 anos, indicada no final da Revista Ophiussa (versão impressa e digital).

Ética na publicação

A Revista Ophiussa segue as orientações estabelecidas pelo Commitee on Publication Ethics (COPE, Comité de Ética em Publicações): https://publicationethics.org/

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EDITORIAL POLICY

Objectives
Ophiussa – Revista do Centro de Arqueologia da Universidade de Lisboa started under the direction of Victor S. Gonçalves in 1996, with the edition of volume 0. After Volume 1 (2017) it became a printed and digital edition of UNIARQ – Centro de Arqueologia da Universidade de Lisboa (ISSN 1645-653X / E-ISSN 2184-173X).
The main objective of this journal is the publication and dissemination of papers of interest, quality and scientific rigor concerning Prehistory and Archeology, mostly from Europe and the Mediterranean basin.

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The journal is divided into two sections: scientific articles and bibliographic reviews. Exceptionally, texts of an introductory nature may be accepted, in the context of specific tributes or divulgations, which will not be submitted to peer-review evaluation. Exemptions from this evaluation are also the bibliographic reviews.
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