

# The Pleistocene elephants of Portugal

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**SUMMARY:** Elephants are present in Portugal since the Miocene. There are two kinds of stratification contexts with remains of Pleistocene elephants: geological and archaeological. We illustrate four archaeological sites. 1) Mealhada, a site located in the central region of Portugal, north of Coimbra. 2) Santo Antão do Tojal (Loures), a very important site in the Lisbon area on the right bank of the Tagus river. 3) Foz do Enxarrique (Vila Velha de Rodão), a site located in the upper Tagus near Spain. This site contains a single Mousterian level, that has the most recent dates for the presence of *Elephas antiquus*. 4) The cave site of Figueira Brava located near the city of Setubal on the south side of Arrabida mountain, where *Homo neanderthalensis* remains were found associated with bones, which have been attributed to *Mammuthus primigenius* with some caution.

## 1. INTRODUCTION

The Proboscidae are represented since very early times in the portuguese fossil record. In the Miocene, Mastodons and *Dinotherium* were very common in Portugal. Most of this evidence is from the Lisbon region. The permanence of elephants in our country continues in the Pliocene and is documented by a tusk fragment of a Mastodon found in the region of Santarém. In the Quaternary the presence of *Elephas antiquus* is recorded in the Pleistocene and some of this evidence comes from archaeological contexts. This paper will focus mostly on these archaeological sites.

## 2. THE SITES

### 2.1 Sites in a geological context

The sites with evidence of the presence of *Elephas antiquus* in Portugal can be divided in two types: sites in archaeological context, where the faunal evidence can be associated to lithic technology and sites in a geological context where these can be associated with evidence of other animal species.

Sites in a geological context: Condeixa-a-Velha and Conímbriga both in the Coimbra region. At the site of Condeixa, the molar of *Elephas antiquus* is from the fossiliferous Condeixa basal conglomerate correlated to the Mindel interstadial (Antunes & Cardoso 1992). In Conímbriga a tusk fragment was found during early excavations of the Roman city of Conímbriga done by Vergílio Correia.

The sites of Meirinha and Casal do Torcato are located in the Alenquer terraces, lower Tagus, where there is also another reference to evidence in this region. It is an elephant bone fragment slightly weathered and found in the Serviços Geológicos collections from the site of Casal do Campo, near the town of Carregado. The sediment that covered it presented the same characteristics of the sediment layer studied by Nery Delgado during his research done in the Carregado region (Zbyszewski 1943).

At the site of Casal do Torcato were found four molar fragments that are from the same tooth. All of them were found during the digging of a well (in a gravel and sandy bed with pebbles). This locality belongs to a lower terrace of the right bank of the Tagus river (12-15

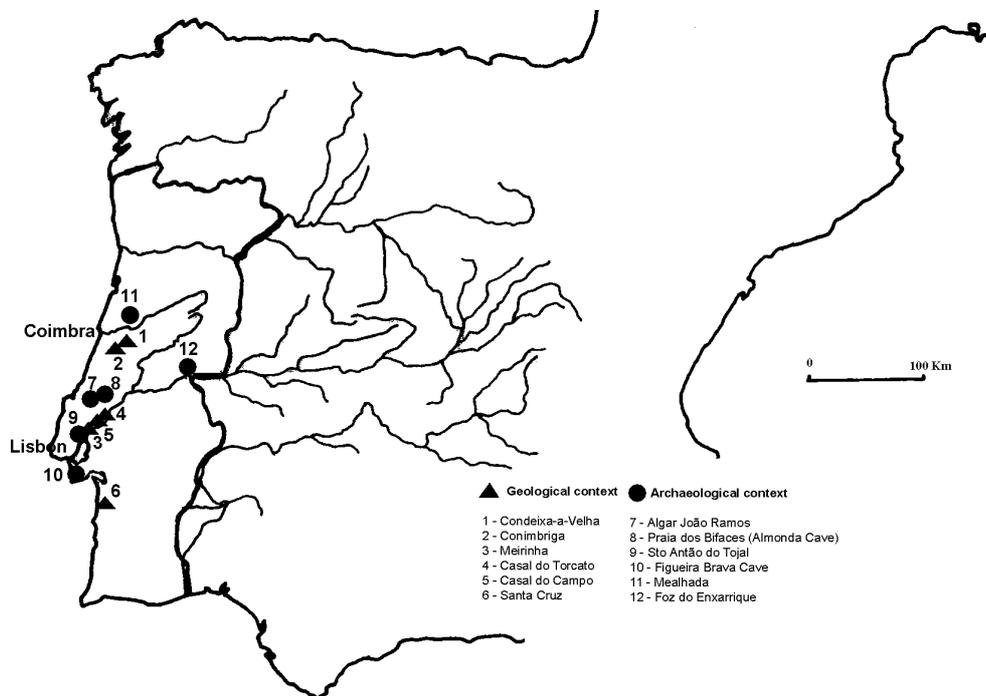


Fig.1 - Location map.

meters), that maybe ascribed to the last interglacial - Riss-Würm, Eemian (Antunes & Cardoso 1992).

The tusk from the site of Meirinha was found during the construction of the Northern Motorway and was integrated in the layer that corresponds to the deposits described earlier by Nery Delgado (Cardoso 1993).

The last site found in a geological context is Santa Cruz, situated on the Alentejo coast north of Sines Cape. Although the exact place, where the unciform of *Elephas antiquus* was found is unknown, it is probably from a site related most likely to Pleistocene deposits that outcrop in this region, mainly rosy sometimes brownish or red sands and gravels, lying upon Lias and Dogger formations (Antunes & Cardoso 1992).

## 2.2 Sites in an archaeological context

We will now present four sites with evidence of *Elephas antiquus* in an archaeological context: Foz do Enxarrique, Gruta da Figueira

Brava, both recent excavations; Mealhada (excavated at the end of 19<sup>th</sup> century) and Santo Antão do Tojal found in the 1940's.

There are still two other sites with an archaeological context: the site of Algar de João Ramos and the site of Praia dos Bifaces (handaxe beach) in Almonda Cave.

The site of Algar de João Ramos is a cavity situated in Serra dos Candeeiros near the village of Redondas (municipality of Alcobaça), the first reference to the existence of elephant bones in this area was made by Paul Choffat (Zbyszewski 1943). He described it as a fragment of a femur of a young elephant quite fossilised and with evidence of having been cut by lithic tools (Zbyszewski 1943). In this site a bone sample was collected and dated by <sup>14</sup>C and it obtained a date of 14,170 ± 330 BP (Antunes *et al.* 1989). Based on this date the elephant evidence was classified as *Mammuthus primigenius* since during this period *Elephas antiquus* had been extinct for some time and the only species surviving in Europe was *Mammuthus primigenius* (Antunes & Cardoso 1992).

In the report of the archaeological work done in the Almonda Cave (1988-89) the presence of a molar plate of *Elephas antiquus* was referred in an area called "Praia dos Bifaces" with an Acheulian lithic industry and a molar of *Equus caballus*. This site derived from the re-deposition of cone sediments formed inside the cave by the deposition of external human occupation material.

Four *Equus caballus* molars from different locals inside the cave including Praia dos Bifaces were dated by the method of Uranium series, and a preliminary date of about 150,000 years BP was obtained. (Zilhão *et al.* 1991)

### 2.2.1 Santo Antão do Tojal

This site is situated in the Várzea de Loures about 8 Km from Lisbon. In geological terms the terrace maybe contemporary of the beginning of the Last Glaciation, it is situated between 5-8m above the average level of the Tagus river. The stratigraphical studies revealed different sedimentary levels.

Here were found several bone fragments of *Elephas antiquus* in the construction work of a canal built by the Junta de Hidráulica Agrícola in the 1940's. In 1941 G. Zbyszewski found at the same place, a incomplete right femur that had in it two small flint flakes stuck inside. Also found was a proximal fragment of the right tibia that was in anatomical connection with the femur described above and several other bone fragments. In association with the elephant remains a Mousterian lithic industry was found along with other faunal remains. In a visit to the site thirty years later G. Zbyszewski, made a new discovery of a fragment of the same femur and a phalanx fragment.

### 2.2.2 Figueira Brava Cave

The first reference to this site was made in 1945 by G. Zbyszewski and H. Breuil. This cave is located near the city of Setúbal on the southern slope of the Serra de Arrábida. It was probably used as a rock-shelter during the middle Palaeolithic (upper Mousterian). The entrance is located at about 5 meters above the

(present day) sea level and communicates with a large corridor that gives access to a large room. Archaeological work carried out between 1987 e 1990 in six archaeological excavations were directed by Teles Antunes and João L. Cardoso.

The stratigraphic sequence is made up of sands rich in shells and bone fragments brought in by man, and also stone implements dated from between 30 and 31 Kyr BP (<sup>14</sup>C, U series) directly overlying marine Tyrrhenian III conglomerates. In the outer, exposed parts of the sands there are calcite consolidated into a hard breccia. A lithic industry and physical evidence (a phalanx and a tooth) of *Homo neanderthalensis* was found in association with a diversified faunal assemblage (Antunes & Cardoso 1992). In the 1988 excavation a molar plate fragment was found with very thin enamel. This fragment is intensely wrinkled. This characteristic led the authors of the study (Cardoso & Antunes 1989) to classify these as *Mammuthus primigenius* though with some caution. On the other hand the date obtained of about 30,000 and 31,000 BP which is 2000 years younger than the evidence from the site Foz do Enxarrique, reinforced this idea.

### 2.2.3 Mealhada

The site of Mealhada is located on the margins of Cértima tributary stream, of the Baixo Vouga river, about 12 Km North of the city of Coimbra. It was first discovered in 1876 and Carlos Ribeiro presented the site at the "Congrés International de Géologie" in Paris in 1878. He referred the existence of two tooth plates, and classified them with some reservation to *Elephas antiquus* (Fontes 1915).

Between 1879-1880 the site was excavated by Nery Delgado, he referred, that it produced some lithic material in a stratigraphic level. This layer upon a fossiliferous deposit was where some evidence of extinct large mammals had been identified (Ribeiro 1995-1997).

In the beginning of the 20<sup>th</sup> century Joaquim Fontes recognised the importance of the discovery, that was clearly differentiated from other sites for its clear integration in well defined

stratigraphical sequence. He undertook the revision of the work done by Nery Delgado. He was able to reconstruct the stratigraphy of some of the wells excavated (three of six wells): The José Duarte, Dr. Adriano and the Dr. Costa Simões well. One of the wells was excavated right down to the jurassic substratum the horizontal galleries were also excavated. G. Zbyszewski who drew attention to the importance of the integration of this site in a terrace deposit contemporaneous of the Last Interglacial Riss-Würm (Zbyszewski 1940), classified the materials discovered there as being Acheulian and Mousterian industries, in a clear association with the fauna of large pleistocene mammals found. He correlated the site basal deposits as contemporaneous of the Mindel-Riss Interglacial. The palaeontological study identified the presence of *Elephas antiquus*, the faunal evidence revealed a molar fragment, a molar plate, two fragments of humerus, a fragment of a tibia, and four other bone fragments. G. Zbyszewski thought at that time, that the evidence was from a young specimen of *Elephas antiquus* (Zbyszewski 1943).

#### 2.2.4 Foz do Enxarrique

The site of Foz do Enxarrique is located on the right bank of the Tagus river at the mouth of the Enxarrique stream, near the town of Vila Velha de Ródão, some 10 km from the spanish border. Large scale excavations have been conducted in the fluvial deposits of the Tagus, under the direction of L. Raposo since 1982. This research has revealed a single archaeological level with very rich lithic assemblage associated with a relatively small amount of bones and teeth from larger mammals. The Uranium-series dates on teeth provide a chronological frame for hominid activities at the site. The Mousterian level dates to a later phase of the Last Glaciation (initial Pleniglacial: transition OIS 2/3). This site corresponds to a more recent period of the Middle Palaeolithic dating to a later phase of the Last Glaciation and has a single archaeological level stratified in fine-grained sediments of the Pleistocene terrace sedimentary sequence.

This site has an assemblage associated with

fauna in which the carnivores are almost absent. The lithic assemblage (mainly from quartzite and quartz), is characterised by numerous discoid and Levallois recurrent centripetal cores along with a high incidence of Levallois by-products, consisting mainly of flakes and where the entire reduction sequences are present. Methods of lithic procurement and transformation indicate an opportunistic and expedient technology.

In the faunal assemblage the elephant remains are represented by a complete, unworn plate from an upper molar and four bone fragments referred to *Elephas antiquus*. This find, indicates the survival of *Elephas antiquus* until the beginning of the latter part of the Last Glaciation (Wurm) and it is one of the last records of straight-tusked elephant known in Europe Bural & Raposo 1999).

### 3. CONCLUSION

It is not possible to establish with our present data, the real importance of the elephant in the prehistoric populations subsistence strategies in Portugal. Although we can say that during thousands of years these large mammals were part of the natural environment in some regions of our country.

The species best represented is *Elephas antiquus* although there are some references at two sites for the existence of *Mamuthus primigenius*. This evidence is put forth with some caution. At the site of Algar de João Ramos, the femur bone found is very fossilized and has evidence of having been cut with a lithic tool (Zbyszewski 1943). The date mentioned for this site is about 14,000 BP, which excludes the *Elephas antiquus* species, but points to another species *Mammuthus primigenius*. Since the climate in this region was probably not favourable for the presence of these large mammals, the question of its identification is very cautious.

Based on the description made by G. Zbyszewski it is very likely, that the femur bone may be a strange element in the stratum of the cave. It may have been introduced into the cave around the same time of the date obtained

Tab.1 - The Pleistocene Elephants of Portugal.

Map N.	Site	Region	Stratigraphy	Datation	Method	Species	Bone Evidence
1	Condeixa-a-Velha	Beira Litoral - Coimbra	Fossiliferous Condeixa basal conglomerate	Mindel interstadial		<i>Elephas antiquus</i> (a primitive form)	Lower right M1 or M2 incomplet
2	Conimbriga	Beira Litoral - Coimbra		Mindel Age		<i>Elephas antiquus</i>	Tusk fragment
3	Meirinha (Terraço do Carregado)	Estremadura – Vila Franca de Xira				<i>Elephas antiquus</i>	Nearly complete left tusk
4	Casal do Torcato (Terraço do Carregado)	Estremadura - Alenquer	Gravel and sandy bed with pebbles	Riss-Würm interglacial		<i>Elephas antiquus</i>	Right upper M 1-2 (probably M1)
5	Casal do Campo (Terraço do Carregado)	Estremadura – Alenquer				<i>Elephas antiquus</i>	Bone fragment
6	Santa Cruz	Alentejo Litoral - Santiago do Cacém				<i>Elephas antiquus</i>	Left unciform
7	Algar de João Ramos	Estremadura - Alcobaça	Level C.2	14,170 ± 330 BP	<sup>14</sup> C	<i>Mammuthus primigenius</i> (?)	Femur fragment
8	Praia dos Bifaces (Almonda Cave)	Ribatejo – Torres Novas		150,000 BP (preliminary result)	Uranium-series	<i>Elephas antiquus</i>	Molar plate
9	Sto Antão do Tojal	Estremadura – Loures	Level C.2	81,900 ± 4000-3800	Uranium-series	<i>Elephas antiquus</i>	Right femur, a proximal half of a left a first phalanx, several bone fragm
10	Figueira Brava Cave	Alentejo Litoral - Setúbal	Level 2 Level 3	30,930 ± 700 30,050 ± 550	<sup>14</sup> C <sup>14</sup> C	<i>Mammuthus primigenius</i> (?)	A plate fragment (upper part of a definitive molar)
11	Mealhada	Beira Litoral - Coimbra		Mindel-Riss interstadial		<i>Elephas antiquus</i>	Several tooth and bone fragments
12	Foz do Enxarrique	Alto Alentejo – Castelo Branco	Level C	33,600 ± 500 BP (mean date)	Uranium-series	<i>Elephas antiquus</i>	Unworn plate from an upper molar

References:

Antunes & Cardoso 1992 (1,2,3,4,5,6,7,9,10,11,12)  
 Zbyszewski 1943 (1,3,4,5,7,9,11)  
 Zilhão *et al.* 1991 (8)  
 Brugal & Raposo 1999 (12)

for this level which includes the femur bone.

In the Figueira Brava Cave, the assignment of the molar plate to a *Mamuthus primigenius* raises some doubts, because in our opinion it is most probable that this fragment of molar plate belongs to an *Elephas antiquus*, given the teeth of both species are very similar. We also present the survival of *Elephas antiquus* at Foz do Enxarrique, with a date of about 33,000 BP, which allows for the presence of this species until the beginning of the latter part of the Last Glaciation (Würm) and it is one of the last records of straight-tusked elephant known in Europe.

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