

# NEOLITHISATION PROCESS IN LOWER TAGUS VALLEY LEFT BANK: OLD PERSPECTIVES AND NEW DATA

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**Abstract:** *This article presents the main goals of a research project design to study the neolithisation process in lower Tagus valley left bank (NAM project – developed, since 2006, by the Research Department of CRIVARQUE, Lda). This area, occupied by late Mesolithic hunter-gatherers at least until 6300 BP, was traditionally seen as a “no-man’s land” during Neolithic period.*

*Ago-pastoralist communities were settled in nearby Estremadura limestone caves and rock-shelters since 6400 BP and in granite plains of central Alentejo at least since 6000 BP.*

*New data brought out by recent works in the area – surveying projects and rescue excavations – have revealed, based upon typological criteria since no absolute date is available for the moment, an Early and Middle Neolithic settlement (Casas Velhas da Coelheira, Vala Real, Monte da Foz I, Moita do Ourives).*

*Using these, still preliminary, data we will discuss some main cultural and chronological issues linking last hunter-gathered societies and first agropastoralist groups in southern Portugal and connections between littoral and in-land Neolithic communities.*

**Key-words:** *Neolithisation process; Lower Tagus valley; Early and Middle Neolithic habitats*

**Resumo:** *É objectivo deste artigo apresentar as principais linhas de investigação e os primeiros resultados obtidos no âmbito do projecto NAM (Departamento de Investigação e Divulgação da CRIVARQUE, Lda), criado para estudar o processo de neolitização na margem esquerda do Baixo Tejo. Esta área ocupada por caçadores-recolectores do Mesolítico final, até cerca de 6300 BP, foi tradicionalmente entendida como uma “terra de ninguém” ao longo do Neolítico, dada a quase total ausência de informação acerca das primeiras sociedades agro-pastoris, que no entanto estão atestadas em grutas e abrigos calcários da Estremadura, desde 6400 BP, e nas planícies graníticas do Alentejo central, desde 6000 BP.*

*Novos dados provenientes de trabalhos de emergência e prospecção superficial revelaram um conjunto de sítios – Casas Velhas da Coelheira, Vala Real, Monte da Foz I, Moita do Ourives – que, de acordo com critérios tipológicos, podem ser enquadrados no Neolítico antigo e médio do Sul do actual território português.*

*Apesar de preliminar, esta informação permite colocar questões acerca dos mecanismos de neolitização da área, das continuidades e/ou rupturas existentes entre os grupos mesolíticos e estes grupos neolíticos, das relações estabelecidas, ao longo do Neolítico, entre territórios do litoral e do interior.*

*Em simultâneo, a evolução da paisagem holocénica, na margem esquerda do Baixo Tejo, gera cenários dinâmicos que exigem/justificam soluções culturais específicas que importa caracterizar.*

**Palavras-Chave:** *Processo de Neolitização; Baixo vale do Tejo; Habitats do Neolítico antigo e médio*

## PHYSICAL ENVIRONMENT

The NAM project area is located in Lower Tagus Valley (LVT), matching with Salvaterra de Magos and Benavente districts. Both districts stand in Tagus valley left bank, where Quaternary fluvial deposits dominate marking a strong dissymmetry with lower Tagus right bank were Miocene rocks outcrop (Cabral, 2006, p. 53).

Muge River, on the North, St. Estevão River, on the South, Tagus River on the West, and Hercynian Massif, on the East, limited the research area.

In this area, we can recognize three main geomorphological units: Tagus alluvial plain – ranging from two to 13 km width, Quaternary terraces – ranging from Q1 to Q4, and Mio-Pliocene deposits of Tagus Tertiary basin, with fluvial erosion and deposition, eustatic movements and tectonic activity being the main geomorphic processes.

The landscape is characterized by a vast plain with elevations ranging from sea level, in the alluvial plain, to 80 m in Q1 and in Mio-Pliocene deposits.

Muge, Sorraia e St. Estevão/Almansor Rivers are the main tributaries streams of Lower Tagus left bank drainage basin, with a general E-W orientation.

Since the first half of the Holocene, Mediterranean climatic conditions are established in the area with salt marsh vegetation near water courses and *Quercus ilex*, *Juniper*, *Arbutus*, *Vitis vinifera* and *Olea europea* (Azevêdo *et al.*, 2006, p. 69) more in-land.

The Holocene evolution of the landscape is strongly marked by changes in sea level – due to post-glacial transgression – that set Tagus estuary further in-land then today. Salty waters and tide effects reached, at least, Muge River, and some foraminifers from Entre Valas core (Santarém) reveal that sporadically marine or brackish water could reach the place during the first half of the Holocene (Azevêdo *et al.*, 2006, p. 13).

The entire region was in the first half of the Holocene very different from nowadays. This is a picture hard to capture since Tagus flood regime (recorded at least since 8540-8110 BC (Benito, 2006, p. 35), lateral migration of

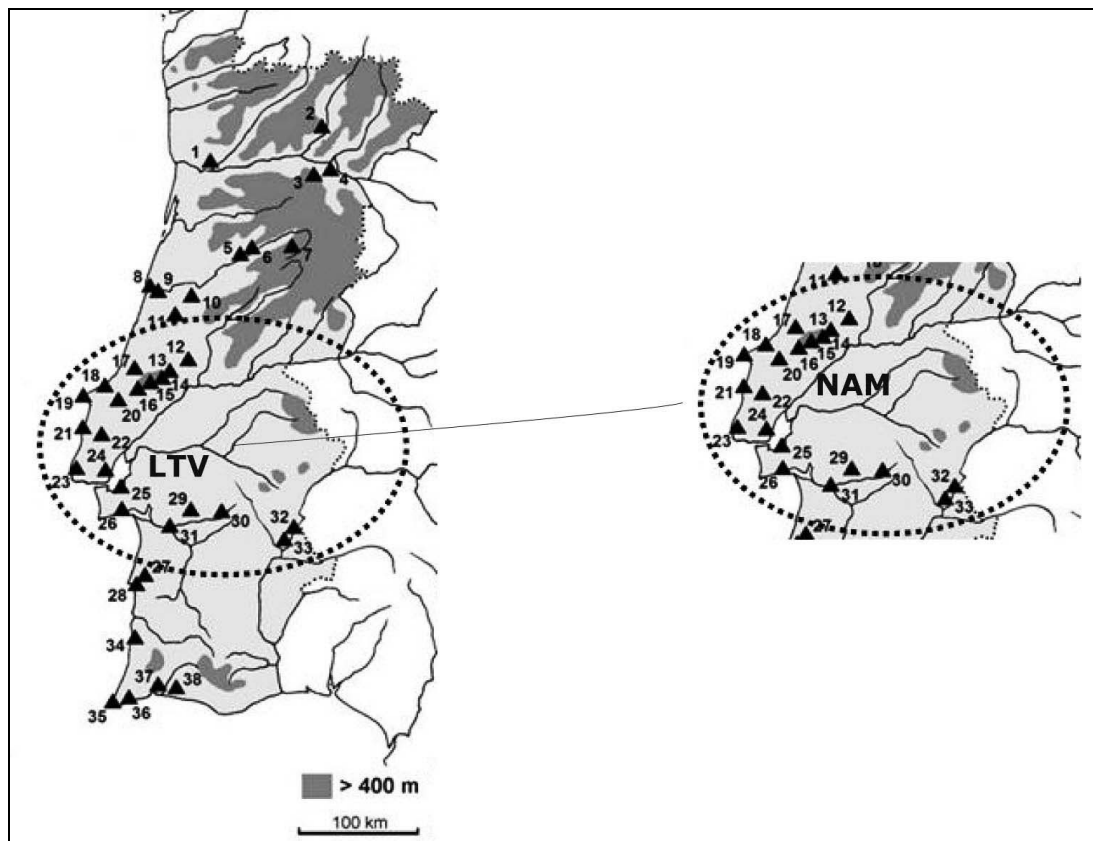


Fig. 6.1. Early Neolithic sites in Portugal: LTV as “no-man’s land” (based on DINIZ e CARVALHO, in press)

the fluvial channels and of the river bars (Ramos *et al.*, 2001, p. 163; Ramos *et al.*, 2006) are responsible for a changing landscape.

River regime stabilized only in recent times, when in the eighteenth century, it was artificial changed, between Valada e Vila Franca de Xira, from several channels to a single one (Azevêdo *et al.*, 2006, p. 65).

Probably the Lower Tagus Valley (LTV) left bank looked like – during maximum transgression in the Middle Holocene (around 6900 cal BP (Freitas *et al.*, 2006) – a salty marsh with some river bars and steeped quaternary terraces suitable for human occupation. In fact, until now, all data about Neolithic settlers came from quaternary terraces where gravel and cobbles river deposits were systemically used as raw material source.

That means that the rich alluvial plain of LTV is a recent (historical?) aspect of the landscape, as the soils great agricultural capability. In Middle Holocene, the region was under estuarine regime with salty waters in Lower Tagus and in final courses of its tributaries.

Therefore, the remarkable and historical fertility of Tagus alluvial plain is a recent feature of the landscape, since salty lands are unsuitable for agricultural practices. On the contrary, hunting, gathering and fishing were, due to

estuarine conditions of Middle Holocene, valuable activities.

In fact, Neolithic settlement and economic patterns would have been deeply constrain by these landscape dynamics with changing conditions from an estuary to an alluvial plain, from a salt to sweet water river, with variably submerged and emerged lands.

These landscape features probably did not attract Neolithic permanent settlement but we know – from recent rescue work and field survey – that LTV left bank is not a “no-mans land” during Middle Holocene like it seems until now. In spite of being irregular, very high fluvial (Ramos *et al.*, 2001) and eolic sedimentation rate cover up paleotopography making field survey a hard task. Archaeological horizons under thick layers of fluvial and eolic sands may never, or only by chance, be found – e.g. from Entre Valas core came from 10.7 m depth organic material dated from 6960 cal PB (Azevedo *et al.*, 2006b, p. 65). This fact could explain why so few data are known from this area – a natural corridor between Estremadura limestone massifs and central Alentejo granitic plains.

Today there are not yet models to explain neolithisation in the area (how, when, and why first agro-pastoralist communities arrived, how they settled, how they use the landscape) but new data from archaeological and

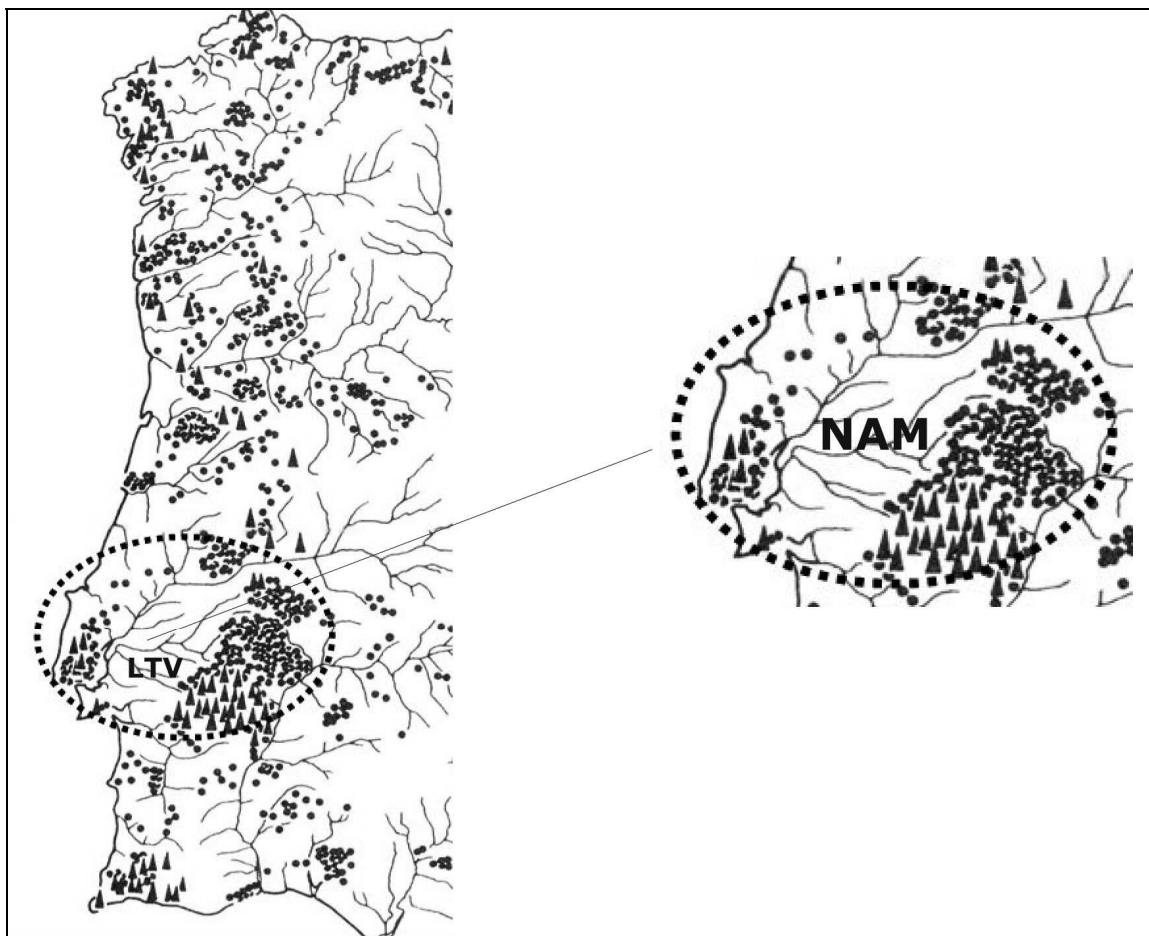


Fig. 6.2. Megalithic monuments in Portugal: no information on LTV (based on KALB, P., 1989)

geomorphological research projects will fill the gap showing that archaeological maps with no Neolithic dots in LTV left bank were a archaeographic, not a historical issue.

### OLD PERSPECTIVES

Traditionally, the lower Tagus valley is considered “no-man’s land” during the neolithization process.

In fact, in final Mesolithic hunter-gathers occupied intensively this area (between 7500 and 6300 BP). These occupations had no correspondence in later periods. The available data of the neolithisation process in LTV can be summarized on punctual information of ORZ1 (Gonçalves e Daveau, 1983-84) and the few shreds of impressed pottery on the upper levels of Muge shell-middens (Arnaud, 1987).

Looking at archaeological cartography we can observe that Estremadura and central Alentejo have a distinct volume of information.

At Estremadura, on the limestone massifs, the presence of neolithic groups is known since 6400 BP.

Cardial Neolithic caves sites (Gruta do Almonda and Gruta do Caldeirão) revealed an important part of information (Zilhão, 2000). However, the archaeological site Pena d’Água (rock-shelter) presents a large chronostratigraphic sequence, where are represented different moments of the neolithisation process. Radiocarbon chronology shows a Cardial Neolithic since 6400 BP, a epi-Cardial Neolithic since 5200 BP and a middle Neolithic since 5000 BP (Carvalho, 1998a).

In Central Alentejo archaeological investigation knew an increase since the 90’s of the XX century (Calado, 2001), but just only a few early Neolithic sites have been excavated. Making a comparison with the middle Neolithic, there’s a scarce of information. Early Neolithic groups are presented in this region since 6000 BP, as demonstrated by an AMS radiocarbon date on bone, collected in a domestic structure of the open air site Valada do Mato (Diniz, 2001). Middle Neolithic groups are traditionally connected with megalithic monuments, in accordance with Leisner interpretation for Poço da Gateira (Leisner e Leisner, 1951). The monument architecture and the artefactual assemblage (trapezes, non-decorated pottery, and polish instruments) dated this site, based on typological criteria. No radiocarbon chronology is available.

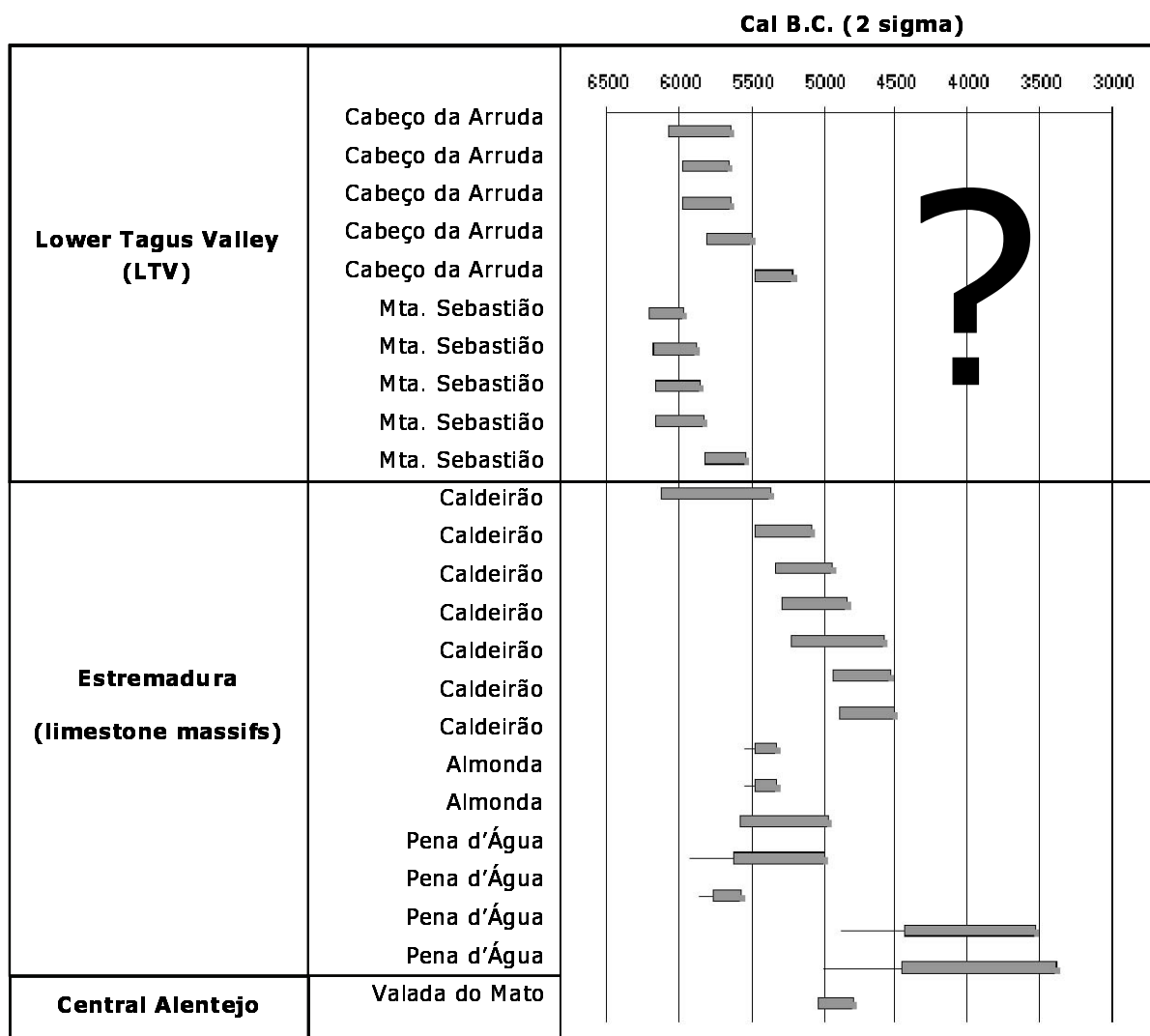


Fig. 6.3. Calibrated radiocarbon chronology of late Mesolithic, early and middle Neolithic sites at LTV, Estremadura and Central Alentejo

NAM Project pretends fill the gap in the archaeological record based on:

1. new available data, that appears during the construction of A13 highway;
2. new archaeological survey.

**NEW DATA**

The main aim of this chapter is to present four new Neolithic open air sites (Casas Velhas do Coelheiro; Vala Real; Monte da Foz I; Moita do Ourives) revealed by recent works in the area. The archaeological remains from these sites allow us to start thinking about last hunter-gathered societies and first agropastoralist groups in Lower Tagus Valley left bank. These, still preliminary, data are not the result of any systematic research project since it was recovered during surveying projects and rescue excavations.

**Casas Velhas do Coelheiro (Salvaterra de Magos)**

Casas Velhas do Coelheiro is an open-air site situated in the district of Salvaterra de Magos, placed in quaternary terrace overlying Coelheiro's stream. In fact, the only landscape domain from this archaeological site is Coelheiro's stream.

A local history student identified it. According to surface material observed along an area of 3000 m<sup>2</sup> he defined it as a Neolithic settlement. The only archaeological work carried out at this site was field survey. The material culture coming from the surface reveals a high number of different kinds of artefacts.

The ceramic is highly represented by a fragmental assemblage of decorated and undecorated sherds. Decorated pottery show different types of impressed, incised and plastic motifs. There is an undecorated pottery sherd with only a horizontal incised line below the rim. Typological

analysis of the sherds showed that they belonged to spherical vessels with a circular mouth.

The lithics, which used local raw materials, are represented by flint laminary products (bladelets and borers) and by a quartzite production system (macroindustry of flakes and retouched flakes). It is interesting to note, the total absence of polished stone items in surface material.

These data suggest, according to typological criteria, that Casas Velhas do Coelheiro is, probably, a settlement of the late Early Neolithic. The decorated pottery sherds and the laminary products present parallels with artefacts recovered from other well-known settlements in southern Portugal and Estremadura. However, it is very important to remember that this site and the data it provides were not a result of an excavation but of a surveying project.

At this time, it is impossible to define the subsistence strategy of groups who lived in Casas Velhas do Coelheiro, but its location, near the Coelheiro's stream, and the absence of artefacts connected to agriculture will take us to suggest that the neighbouring resources (aquatic resources) were still very important to those groups.

#### **Vala Real (Salvaterra de Magos)**

Located in the district of Salvaterra de Magos, Vala Real is an open air site that was identified and partly excavated by a rescue work that took place during the construction of A13 (Highway Santarém-Algarve). The site is situated in quaternary terrace over a large alluvial plain near Mago's stream, its only landscape domain (Aldeias e Gaspar, 2004). Geologically, sandy deposits characterize Vala Real.

The excavations took place in the area affected by the highway, where archaeological material was not *in situ*. The contexts and the data resulted from this archaeological work are related to post-depositional disturbances and slope movements (Aldeias e Gaspar, 2004). However, the several sedimentary sequences observed by the authors yielded to the archaeological record vestiges of the Neolithic.

The material culture brought out by the excavation showed a very high lithic artefact density and a very low ceramic density. There were only three decorated sherds, one with horizontal incised lines, one with a plastic motif with impressions and another one (the only decorated rim) with a plastic motif. In forty-two sherds, only six had rim. A very fragmented assemblage defines the ceramic, but, according to the authors, it was possible to understand their typological form, simple ones and spherical vessels (Aldeias e Gaspar, 2004).

The lithic economy is represented by local raw material exploitation according to products function. Laminary products, rare in the archaeological record, are flint made and bladelets and a prismatic borer represent them. The

only prove of microlithic industry is represented by a flint crescent. On the other hand, quartzite industry is well represented. Quartzite (and quartz, in a very low density) is associated to flake production, and according to the authors, the site function, placed near by a quartzite source, is related to the raw material available (Aldeias e Gaspar, 2004).

In lithic industry, it is also interesting to note the presence of a flint arrowhead. This artefact type is known only in the Neolithic settlements of Portuguese southwest coast.

Despite the innumerable limitations inherent in the study of an archaeological find of this type, according to the authors, Vala Real is an Early Neolithic settlement and this chronological conclusion is compatible with archaeological evidence. Once again, the typological criteria was used for chronological and cultural definition, fact related with the absence of eco-facts and the unequivocal parallels in the lithics with Neolithic contexts in the Limestone Massifs of Estremadura (Aldeias e Gaspar, 2004).

According to the authors, the numerous presences of burnt cobbles in archaeological record could suggest the existence of hearths in the settlement. These hearths were dismantled during the erosion of soil covers and land in this area by slope movement (Aldeias e Gaspar, 2004).

Now, the material culture removed from the excavation in Vala Real is the best data available. For the future, it could be possible to make some soundings in the original place of the site, and then we will try to study some issues and questions that are still opened and unsolved.

#### **Monte da Foz I (Benavente)**

The site Monte da Foz I is located in Benavente's district. It is an open-air site identified during a surface work and it was partly excavated by a rescue excavation (directed by two of the signatories) that took place during the construction of A10 (Highway Arruda dos Vinhos – Benavente). The site is situated in large plain of a quaternary terrace, near Sorraia River. Geologically, Monte da Foz I is characterized by sandy deposits. The surface material can be observed in a large area of 2 ha (Neves e Rodrigues, 2006).

Excavation took place in different areas affected by the highway. Twenty-two soundings of 2 x 2 m<sup>2</sup> were made and the results were very similar, except in four squares (20m<sup>2</sup>). The deposits were excavated by natural stratigraphic units and systematically dry sieved. The layers were highly disturbed by roots and large burrowing animals. The area where Monte da Foz I is placed suffered, in the last century a high level of farming work using heavy machines. The degree of destruction suffered in large areas is visible.

In all the soundings vestiges of Neolithic occupation were recovered. During material culture analysis, it was

possible to identify two different moments in Neolithic period: late Early Neolithic and Late Neolithic/Calcolithic.

In some soundings it was very difficult to understand where it ends one human occupation and starts the other. The sandy deposits, linked to post-depositional disturbances and burrowing could put two occupations in direct stratigraphic contact, making a palimpsest of two different occupations. Only in laboratory, by typological and technological analysis of the material culture it is possible to define a correct and secure chronology, for the stratigraphic sequences. Studying Monte da Foz I data means dealing with several issues related with settlement geographic definition and horizontal stratification (Neves e Rodrigues, 2006).

The four squares above mentioned (20m<sup>2</sup>), were the only ones where were found a secure and preserved archaeological context. That context showed a high artefact density probably related to late Early Neolithic. The archaeological record is very rich and brought out artefacts of all types and technology. The ceramic is defined by a very large assemblage of undecorated sherds and undecorated sherds with only a horizontal incised line below the rim. The decorated pottery recovered are in lower number when compared with the undecorated or the ones with a horizontal line below the rim. They were decorated with different types of impressed, incised and plastic motifs. In the decorated pottery, the incised sherds are in higher number. The pottery decoration had similarities in other contexts of Early Neolithic in southern Portugal. There is also one sherd of cordial pottery, but its meaning is minor in the archaeological record when compared with the rest of the ceramics. Typological analysis showed that they belonged to spherical vessels with a circular mouth.

In addition to pottery, there are some amphibolites polished stone items (2 fragments of hand axes and two adzes). They are in lower number in the archaeological record but its importance is unquestionable.

As well as the ceramic, the lithics appeared in large number in this context. Flint and quartz laminary products brought out an interesting number of blades, prismatic borers and bladelets. Microliths and geometric armatures are well represented by segments, crescents and trapezes. However, quartzite production system (macroindustry of flakes and borers) is the most represented.

Associated with material culture was a habitat structure. It seems to be a "cuvette" of hardened, darkish sands containing burnt cobbles. This type of structure has parallels in other contexts of Neolithic settlements of Portuguese southwest coast. The scientists who worked in those areas named these structures as hearths. With the purpose of getting any evidence of organic material and eco-fact, sediment sample was saved.

These data suggest a settlement of late Early Neolithic in Monte da Foz I. Even no absolute chronology has been obtained for that context is possible to define it according to typological criteria. On the other hand, it is important to note, that Monte da Foz I had other human occupations which are not well defined, Late Neolithic/Calcolithic. The results that come from these archaeological works have to be carefully study. Some artefacts chronology and cultural definition are not very sharp, especially between two distinct moments in the Portuguese Neolithic (Neves e Rodrigues, 2006).

Site future works will focus in the typological and technology analysis of the artefacts. Future fieldwork will wait for the results of the laboratory.

#### **Moita do Ourives** (Companhia das Lezírias, Benavente)

The archaeological site Moita do Ourives was identified during the construction of the A13 (Highway Santarém-Algarve). The area affected for the construction of the road was integrally excavated (directed by one of the signatories), in a total of about 150m<sup>2</sup>. The site is located in the geographic area of Benavente's district and is located inside the area of the Companhia das Lezírias S.A. It is an open-air site near to the St. Estevão's stream, not having any domain of the landscape or defensive concern. Geologically, sandy deposits characterize Moita do Ourives. The excavation took place in a large open area allowing the identification of preserved archaeological contexts, in a stratigraphic sequence of 50 cm. Deposits were excavated by natural stratigraphic units and systematically dry sieved (Rodrigues, 2007).

Recent farming works or post-depositional disturbances did not affect the archaeological record. On the other hand, roots or animal burrows originate the only disturbances, which made some vertical dispersion of the archaeological artefacts.

The main archaeological context brought out by this work was the three hearths recovered in distinct areas of the settlement. An assemblage of cracked burnt cobbles makes these structures. However, there were not, associated with the hearths, eco-facts, fauna remains or any other evidence of organic material. Therefore, a sample of sediment was saved from each habitat structure.

The material culture in the archaeological record is in a significant number. The ceramics are characterized for being undecorated, only existing two body sherds with incised motifs. The forms correspond, typologically, to goblets and simple sphericals. Polished stone items are represented with only one artefact, an amphibolite's hand axe.

Lithics are in majority in the archaeological record. Bladelets and a single blade represented flint laminary products. The microindustry and geometric production is represented a by flint trapeze. However, quartzite lithic



Fig. 6.4. Rescue work at Moita do Ourives

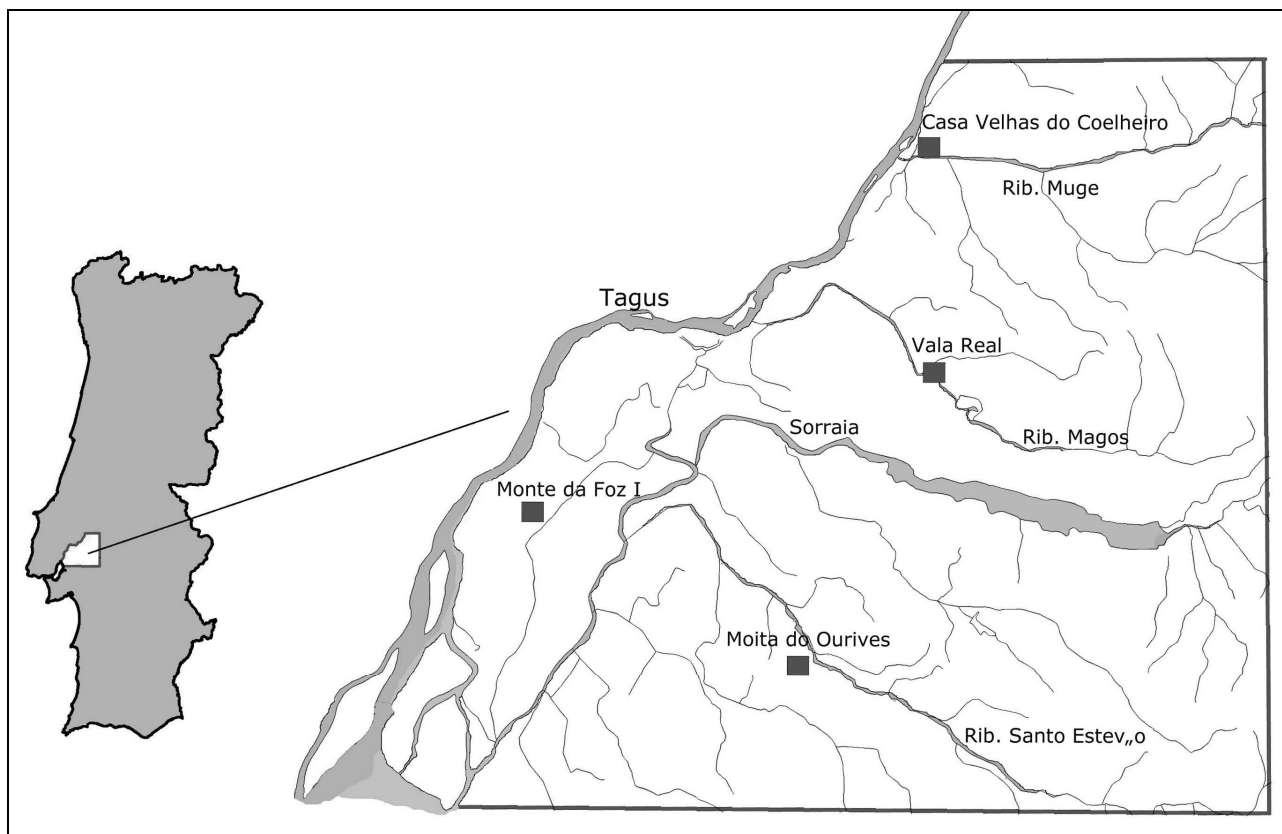


Fig. 6.5. Geographic distribution of archaeological sites in LTV (new data)

production system (macroindustry of flakes and borers) is highly represented in archaeological record.

From the study of the material culture and looking to similar contexts in Central Alentejo (Megalithic monuments) and Estremadura (Limestone Massifs of Estremadura; Pena d' Água), these data suggest that Moita do Ourives was a Middle Neolithic settlement. The artefact density and its homogeneity put the range of occupation for this site in a short period during the Middle Neolithic (Rodrigues, 2007).

The absence of eco-facts in the archaeological record does not help to characterize group subsistence strategies, which remain future research central goal.

### OLD PERSPECTIVES AND NEW DATA

In sum, the data now available show us an important group of archaeological sites for understanding Neolithisation process in Lower Tagus Valley left bank. First, they allow us to talk about an effective Early and Middle Neolithic settlement in this area in opposition to the old and traditional view of the “no-man’s land” that took place after the abandonment of the Muge shell middens around 6300 BP.

From these data, we can say that Lower Tagus Valley left bank was occupied, attending to typological criteria, if not earlier, in the end of the 6<sup>th</sup> millennium BC/ first half of the 5<sup>th</sup>. Small Early Neolithic groups are settled in quaternary terraces, near water streams, exploring local available raw materials (cobbles, quartz and rare flint from gravel deposits), with decorated pottery and rare, or none, polished stone tools. Due to large containers and agricultural tools absence economic strategies, attending to local landscape features, must have remained largely of a broad spectrum type in temporary habitats.

By the Middle Neolithic, some changes occurred. Pottery became undecorated, some polished artefacts appear and flint from primary sources was used. Although so, data from Moita do Ourives (with no large pottery containers, perishable structures and only a single polished stone tool) do not fit with an agricultural group material record.

If some kind of environmental adjustment could have been made, during Early and Middle Neolithic, giving raise to settlements patterns deeply related to LTV landscape features is a unsolved question that only future field and laboratory work can answer.

On the other hand, these new archaeological data are associated with several problems/questions/issues:

- Settlements partially excavated and only in small and restricted areas
- Archaeological record showing sites with large and different chronological and cultural human occupations

- Sandy deposits bringing taphonomic problems which are linked eco-facts absence in archaeological record
- Sites chronological definitions have been made using only typological criteria.

These new data and the questions above mentioned are the stimulus of the multidisciplinary research project NAM, focus on 6<sup>th</sup> and 5<sup>th</sup> millennia cal B.C time span.

In future phases, we have the purpose of changing these issues into scientific realities. New research strategies will bring new data that will be used to discuss settlement patterns, economic strategies and cultural affiliation of these Early and Middle Neolithic groups, in a changing landscape.

Therefore, future research trends will focus on:

- geomorphological data – Lower Tagus Holocene evolution;
- field survey – spacial analysis and settlement patterns;
- excavation work – habitat structures/habitat function/
- artefacts and eco-facts – relative and absolute chronology/economic strategies/ cultural affiliations;

that will allow us to study and “rebuild” the way of life of the last hunter-gathered societies and first agropastoralist groups.

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