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# The *TransTexTec* Project: exploring transitions in textile technologies and economies in southern Portugal (2200–700 BCE)

## Introduction

Research on early textile production in southern Portugal remains underdeveloped; recent work has nonetheless demonstrated that, despite the scarcity of textile finds (Soares et al. 2018), it is possible to explore the dynamics of textile production in this region, as well as its technological and logistic features, and its socioeconomic and symbolic significance. This, however, requires an integrated, interdisciplinary, and creative approach to multiple strands of evidence, covering different stages of the textile *chaîne opératoire*. Work along these lines has led to notable progress in the study of textile production in the southern Portuguese Chalcolithic (Costeira 2024a; 2024b) and Iron Age (Gomes and Dias 2024). The same cannot be said for the Bronze Age (BA), a period which, in this regard, remains severely underexplored. This knowledge gap raises significant concerns, for three interconnected reasons:

- 1) It limits the understanding of the diachronic development of textile crafts, as there are notable discontinuities between the pre- and protohistoric periods which cannot be understood without characterising the developments of the BA.
- 2) It hinders the assessment of the full reach and ramifications of the “textile revolution” which took place during the second millennium BCE in other areas, including neighbouring Spain (Basso Rial et al. 2021; 2022; 2023).
- 3) It may be obscuring a major economic feature of the

development of regional BA societies and a potential factor of sociopolitical change during this period.

Lately, however, there has been an increase in research concerning the regional BA. Recent data has shed new light on the settlement patterns and funerary practices of this period (Mataloto 2013; Soares 2013; Soares et al. 2021), but also on some of the economic underpinnings of the sociopolitical models attested throughout this period. This being said, the role of craft activities (except for metallurgy) in the development of regional BA communities remains underexplored. Textile production, which has been recognised as a key economic activity at this time elsewhere in Iberia (Basso Rial et al. 2021; 2022; 2023) and beyond (Sabatini and Bergerbrant 2019), is a case



Fig. 1: Logo of the TransTexTec exploratory project (Image: Francisco B. Gomes)

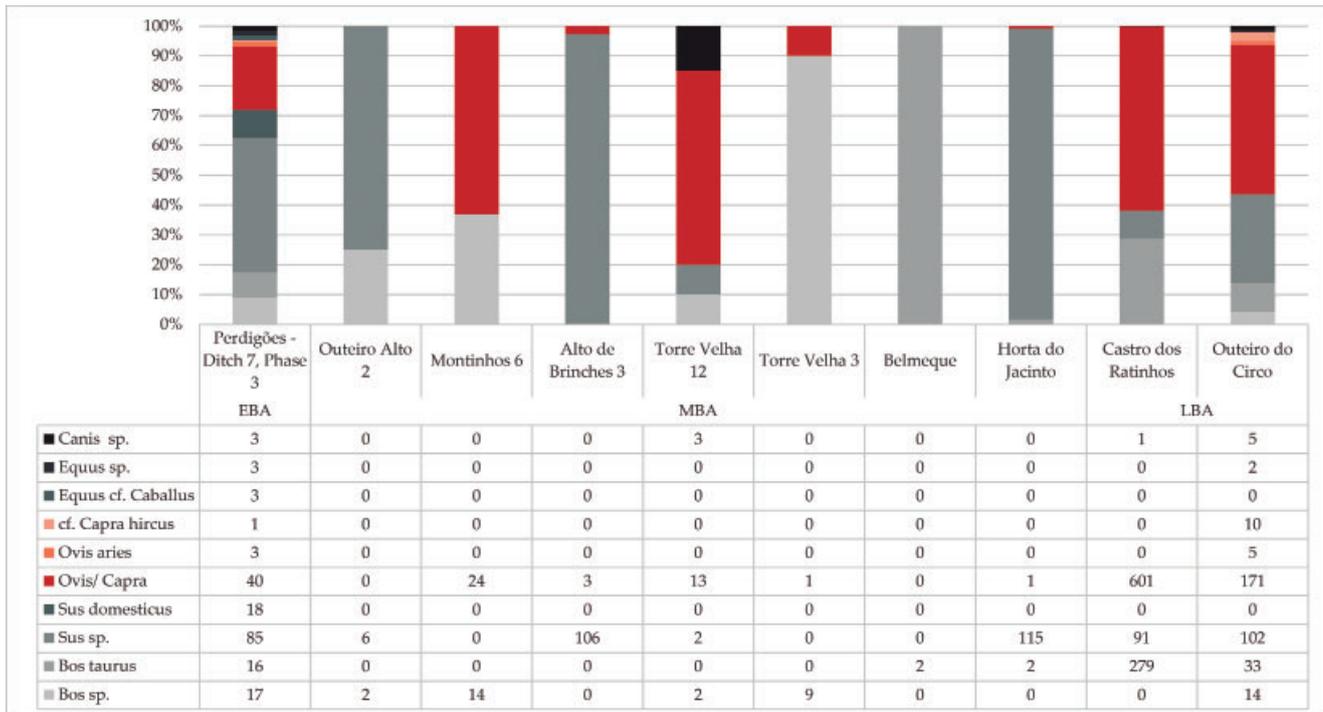


Fig. 2: Percentage of different mammal species in southern Portuguese BA faunal assemblages, with caprines highlighted (for data sources see references in the text)

in point, as data regarding this craft during the BA remains elusive.

While some scarce textile remains have been reported for the Middle Bronze Age (Soares et al. 2018), discussions regarding the textile tools of this period have only recently begun (Basso Rial and Costeira in press). Preliminary data on loom weights in particular suggest a replacement of regional Chalcolithic types by new, cylindrical weights (Basso Rial and Costeira 2025). A similar process is well documented in southeastern Iberia (Basso Rial et al. 2022; 2023) and has been related to a broader technological and economic transition spurred by the introduction of wool (Basso Rial et al. 2023). This is consistent with a body of evidence from Europe and the Mediterranean, which outlines a veritable BA “textile revolution” related to the generalisation of wool textiles, with all its socioeconomic ramifications (Breniquet and Michel 2014; Sabatini and Bergerbrant 2019; Sabatini et al. 2019; Schier and Pollock 2020).

Zooarchaeological studies, which may shed further light on the role of wool production during the regional EBA and MBA, are scarce and mostly limited to small assemblages accompanying funerary contexts, suggesting a growing significance of caprines (Costa et al. 2019; 2023), while non-funerary samples are generally sparse (Costa and Cabaço 2012; Costa and

Baptista 2014; Delicado et al. 2017; Senra et al. 2019; Costa et al. 2019; 2023; Costa 2013; 2021), with some exceptions (Almeida and Valera 2021). Nevertheless, existing data suggests a significant increase in the importance of sheep/goats, at least in some faunal assemblages (Costa 2013; 2021). New work is required to understand what role the demand for wool plays in this process, and in the development of sheep herding throughout the BA.

Further insights into textile crafts can be glimpsed from bioanthropological data. Dental marks interpreted as the result of the use of teeth as a “third hand” in textile processes have been documented in MBA funerary contexts (Fidalgo et al. 2019; Willman et al. 2021), opening a window into the identity and status of textile craftspeople.

For the Late Bronze Age, the available evidence is even scarcer, as only a few textile tools, namely loom weights, have been published so far (Mataloto 2013). Zooarchaeological studies remain very limited in number too, even if the continuity of a shift towards a prevalence of caprines persists in the LBA at Castro dos Ratinhos and Outeiro do Circo (Liesau and García 2010; Almeida et al. 2023). Other indicators, however, suggest an important socioeconomic role for textiles and an increased investment in dress as an identity and status marker. The appearance of



Fig. 3: 3D Scan of a Middle Bronze Age cylindrical loom weight from Montinhos 6 (Serpa) (Model: Carina Nunes)

the earliest bronze fibulae (Gomes in press) and the presence of pottery decorated with geometric motifs possibly reproducing textile patterns (Cáceres 1997) suggest that textiles became an important social and ideological commodity at this time.

It seemed therefore that there were enough indications of a significant shift in textile production during the BA to warrant a more in-depth exploration, mobilising as much information as possible to understand the development of the textile craft in southern Portugal during this period and assess its impact on local communities. To do so, an 18-month exploratory project was set up, with the title *TransTexTec, Exploring transitions in textile technologies and economies in the long second millennium BCE (2200 – 700 BCE): the southern Portuguese territory as a case study* (fig. 1). This project is funded by the Portuguese Foundation for Science and Technology and hosted by UNIARQ, the Centre for Archaeology of the University of Lisbon, and the School of Arts and Humanities of the University of Lisbon.

#### **The *TransTexTec* exploratory project: goals, methods, and tasks**

To fill in the current gap in knowledge, the *TransTexTec* project will deploy an interdisciplinary, multi-proxy approach to assess the role and significance of textile production in the political economies of the southern Portuguese BA. Its core goals are to shed light on the second millennium BCE as a critical watershed in the development of textile technologies and economies, to foster a better understanding of the socioeconomic structures of the regional BA communities, and to

incorporate Portuguese data into pan-European discussions on the nature and scope of the BA “textile revolution”.

In order to pursue these goals, the *TransTexTec* project will systematise and expand the existing datasets related to regional textile technologies and economies. Considering the available evidence and taking the textile *chaîne opératoire* as a framework, the project will comprise three major tasks, focusing respectively on textile resources, textile production, and the sociopolitical and symbolic significance of textiles.

The first task will explore potential shifts in patterns of textile fibre procurement. A major research question is whether the production of wool became a significant economic factor in the region during the second millennium. As faunal remains are a vital source to address this question, this task will systematise and expand existing zooarchaeological datasets on sheep herding (fig. 2) and deploy new analytical methods to assess the role of wool production in strategies of herd management.

Existing studies on BA faunal assemblages (see above) suggest an increase in the significance of caprines during this time, especially during the MBA and LBA. However, this data still needs to be finetuned to discuss the potential significance of the production of wool. In particular, a better understanding of the ratio of sheep to goats among caprines is necessary.

For this purpose, and alongside the implementation of morphological and linear biometric analyses, the project will promote a pilot study using Zooarchaeology by Mass Spectrometry (ZooMS) on selected assemblages from different time points within the BA to assess the representativeness of sheep. The results will be cross-referenced with data on the sex composition and culling patterns of herds to gauge the significance of wool as a factor in herd management, and its change over time. Attention will also be paid to potential changes in sheep types as indicated by morphometric data, as these may relate to an intensification in wool production.

A second task, dealing with textile production from a technological and logistical perspective, will focus on the study of textile tools (fig. 3). Currently, textile tool assemblages are reported for 17 regional BA sites (Basso Rial and Costeira 2025). These, however, still need to be further characterised. The project will undertake a systematisation of this data and in-depth studies of selected assemblages from different time points within the BA to establish their typological, metrological, and functional parameters.

Of particular concern will be the understanding of the rhythm and sociocultural context of change in textile

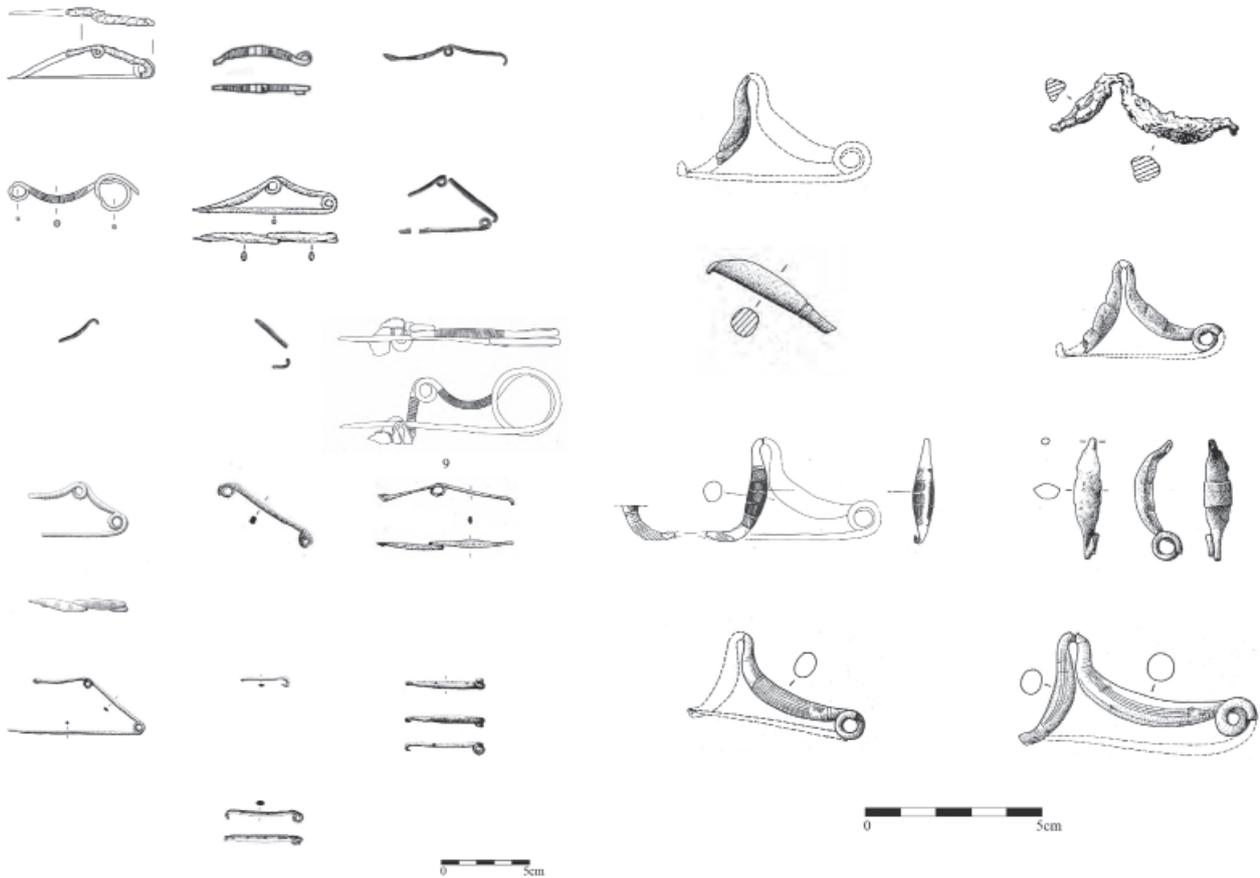


Fig. 4: Main types of Late Bronze Age fibulae from the Portuguese territory (*apud* Gomes in press, with bibliography)

tools, namely through systematic comparisons with better known areas (Basso Rial et al. 2022). Finally, the functional parameters of documented tools will be analysed and experimentally tested following existing guidelines (Andersson Strand and Nosch 2014).

This task will also look into the craftspeople and the social context of textile production. In this regard, data from funerary sites is particularly relevant. The project will integrate bioanthropological data, namely dental marks relating to textile activities (Fidalgo et al. 2019; Willman et al. 2021), with other contextual information to discuss the identity and status of textile producers. Finally, the third task will focus on secondary sources related to the nature and use of textiles in the southern Portuguese BA. These include dress complements in non-perishable materials, especially fibulae (Gomes in press) (fig. 4). Their introduction is indicative of shifts in dress patterns and practices during the BA, but the project will deploy innovative approaches, including morphometric, statistical, use-wear, and experimental studies to assess their functional parameters and their

usability with different textiles/ garments.

On the other hand, this task will also explore the link between the patterns of LBA decorated pottery, namely burnished pottery (Osório 2016), and those of high-end, perhaps imported textiles. Such a link has been hypothesised (Cáceres 1997) but not yet proven. Here it will be experimentally tested by attempting to reproduce the patterns of these decorations using the available textile technology of the period.

#### Echoes of the “textile revolution”: final remarks

By the end of this project, the produced body of data will be fully integrated to create a coherent reconstruction of the technical, economic, and social features of the regional BA textile production, which can then be placed in its diachronic setting.

In addition, it seems crucial to compare the Portuguese data with those available for the BA in other areas, with particular emphasis on southeastern Iberia (Basso Rial et al. 2021; 2022; 2023), an area which offers parallels with southern Portugal (Basso Rial and



Costeira 2025). Ultimately, however, the project aims to highlight changes in regional textile technologies and economies and their links with the broader BA “textile revolution” documented across Europe and the Mediterranean, and to place Portuguese data on the map of international scientific debates and research.

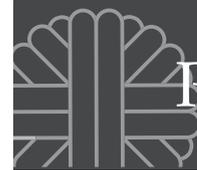
Finally, it is worth highlighting that this project offers a unique opportunity to raise the profile of textile archaeology in Portugal, where it remains underexplored. It also opens the doors to new collaborations and synergies with different stakeholders, such as craftspeople and creatives. The project will also seek to deploy creative storytelling techniques about textile heritage to engage a broader public, raising awareness of the importance of this crucial and highly relatable aspect of cultural heritage.

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