

Trading Horizons: Quinta do Marcelo (Almada, Portugal) and the transition to the 1st millennium B.C.E. on the Tagus Estuary

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EN Abstract. The site of Quinta do Marcelo has been an unavoidable mark in the bibliography addressing the later phases of the Bronze Age along the Portuguese Atlantic coast, particularly with regard to the large-scale trade networks and the impact caused by the arrival of foreign elements to the area. For the very first time, we present the entire artefact assemblage, which, as anticipated, proves to be remarkably rich and diversified. Additionally, we conducted a detailed analysis of the contexts identified during the excavation carried out in 1986. This new approach allowed us to reassess some questions perpetuated in specialised bibliography and reevaluate the chronological framework of the occupation, which lasted until the Iron Age. In addition to two combustion structures and what has been described as a negative structure, small pit-like structures, possibly associated with vineyard planting, were also identified, corresponding to the earliest trace of this activity in Portuguese territory.

Keywords: Late Bronze Age; Iron Age; wine production; Phoenicians; pattern-burnished ceramics; fibulae

ES Horizontes comerciales: Quinta do Marcelo (Almada, Portugal) y la transición al I milenio a.C. en el estuario del Tajo

ES Resumen. El sitio arqueológico de Quinta do Marcelo ha sido un marco inevitable en la bibliografía que aborda las fases finales de la Edad del Bronce a lo largo de la costa atlántica portuguesa, particularmente en lo que respecta a las extensas redes comerciales y al impacto causado por la llegada de elementos extranjeros a la zona. Por primera vez, presentamos un conjunto completo de artefactos que resulta ser notablemente rico y diversificado. Además, llevamos a cabo un análisis detallado de los contextos identificados durante la excavación realizada en 1986. Este nuevo enfoque nos permitió reevaluar algunas preguntas planteadas en la bibliografía especializada y reconsiderar el marco cronológico de la ocupación, que perduró hasta la Edad del Hierro. Además de dos estructuras de combustión y lo que se ha descrito como una estructura negativa, también se identificaron pequeñas estructuras tipo fosas, posiblemente asociadas con la plantación de viñedos, correspondiendo al rastro más antiguo de esta actividad en territorio portugués.

Palabras clave: Bronce Final; Edad del Hierro; producción de vino; fenicios; cerámica motivos bruñidos; fibulas

Summary: 1. Introduction. 2. Revisiting contexts, structures, and radiocarbon dates. 2.1. Analysing “bolsas” 1 and 2. 2.2. The negative structures – evidence of vineyard planting? 3. The artefact assemblage. 3.1. Square E12.2 - “Bolsa 1”. 3.2. Squares E12.3 and E12.4 - “Bolsa 2”. 3.3. Artefacts without context. 4. Discussion. Acknowledgements. Bibliography.

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1. Introduction

Archaeological findings concerning the late Bronze Age and early Iron Age in the Tagus Estuary have seen significant growth in recent years. Several authors have devoted attention to analyzing this dataset, emphasizing the density and diversity of occupation and its pivotal role in the intercultural exchanges between the Mediterranean and the Atlantic regions (Vilaça and Arruda 2004; Cardoso 2004; Vilaça 2007; Sousa 2016; Arruda *et al.* 2017; Vilaça and Cardoso, 2017, among others). Within this framework, Quinta do Marcelo has stood out due to the exceptional nature of the artefacts discovered, highlighting its central role in long-distance contacts during the Late Bronze Age (Melo and Senna-Martinez 2000; Cardoso 2004; Vilaça and Arruda 2004; among others).

The archaeological site of Quinta do Marcelo (CNS 3237) is located in Almada, on the left bank of the Tagus River mouth. It is placed in Miocene land with good agricultural conditions, southern exposure, and an elevation of about 47 meters that provides some control over the surrounding landscape, although with no apparent defensive concern (Fig. 1). It is inserted in a gentle slope that ends in a valley which crossed the territory from West to East. The valley extended approximately from the Atlantic coastal area to the “mar da Palha”¹, an inner golf with deep waters which provides a privileged area for anchoring.

The site was identified in 1985 in the scope of a development plan that entailed opening accessways in the area. Prospecting led to the identification of “areas with pottery and faunal remains” in a slope (Barros and Sabrosa 1986: 1). Given the lack of legislation requiring mandatory archaeological interventions before

initiating any development plans at the time, and despite the efforts of the team who identified the archaeological site, it was not possible to conduct an adequately programmed intervention (*ibidem*). Thus, the site was excavated in 1986, during the construction works for the current Anselmo de Andrade High school (Fig. 2), by a team composed of elements from the Municipality of Almada and the Archaeology Centre of Almada (*ibidem*). After the excavation, and due to the construction works, the site was mostly destroyed (*idem*: 2). The collected items were stored in the archaeology reserves of the Municipality of Almada and have since been the subject of several studies, focused on a few artefacts of the collection (Barros 1998; Cardoso 2004; Vilaça 2008-2009; Valério 2012; among others).

Quinta do Marcelo’s occupation was, evidently, not isolated. The northern cliffs of the left bank of the estuary have a long history of documented occupation, such as in Quinta do Percevejo, whose data, although limited, clearly places it within the Late Bronze Age dynamics (Barros and Espírito Santo, 1991). Additionally, research has considered the possibility of occupation during this period at Quinta do Almaraz (Barros, Cardoso, and Sabrosa, 1993; Arruda 2005, 2017; Olaio 2023), which is one of the most important Iron Age settlements on the Atlantic coast of the Iberian Peninsula and is situated just 1.7 km away from Quinta do Marcelo (Fig. 1).

This work aims to provide an accurate presentation of the excavated contexts and the complete artefact assemblage gathered from Quinta do Marcelo, with the goal of highlighting its significance within the broader context of the Lower Tagus during the Late Bronze Age and the first centuries of the 1st millennium B.C.E.

¹ The name by which is known the widest area of the Tagus mouth.

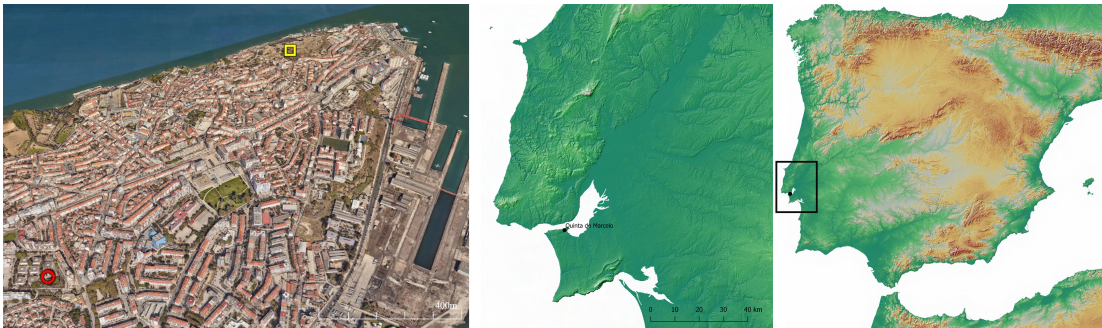


Fig. 1: Location of Quinta do Marcelo (red circle) and Quinta do Almaraz (yellow square) and Quinta do Marcelo in the context of the Iberian Peninsula.



Fig. 2: Quinta do Marcelo in the final stage of excavation (Photo from the Almada Museum Archive).

2. Revisiting contexts, structures, and radiocarbon dates

The excavation of Quinta do Marcelo identified a very limited number of preserved archaeological contexts, which translates into a minimal record. It does, however, justify a review and synthesis of the recovered data, which can provide some fresh perspectives on the archaeological site.

Excavation works began by the mechanical excavation of a trench of approximately 50 meters length, with an East/West orientation (Barros and Sabrosa 1986: 2). Layer 1 was considered highly disturbed and was entirely removed using mechanical means (*ibidem*). After removing this first layer, with approximately 1 meter thickness, it was possible to conclude that the archaeological site was preserved in an area of about 30 m², adjacent to the slope where two “bolsas”² were identified (*ibidem*). After delimiting the archaeological

site, the excavation area was subdivided into 2.5-meter-wide parcels, three of which were excavated (*ibidem*). The three intervened areas were called E12.2, E12.3, and E12.4. These three areas were excavated by artificial plans 5 cm long, and two other layers are mentioned in the report (Fig. 3): Layer 2 was considered undisturbed, except for a few spots (*vide infra*), and 3, the geological substrate (Barros and Sabrosa 1986: 2).

According to the archaeological report, “two important structures were identified: a bonfire and a “windbreaker”, both “quite precarious, formed by irregular limestone blocks”³ (Barros and Sabrosa 1986: 3) (Fig. 4). However, according to later works and examining the existing plan, it is possible to conclude that as of a particular time, the existence of a second bonfire was considered, relatively close to the stone alignment interpreted as a “windbreaker” (cf. Barros 2000: 12). These two combustion areas, which tended to have a circular

² In Portuguese, the term “bolsa”/“bolsas” is commonly interpreted as a form of negative structure.

³ Quotes from the field report were translated by the authors from Portuguese.

shape, are characterised by the presence of a “clay plaque, delimited by blocks of limestone filled with pebbles” (*ibidem*). The structure interpreted as a “windbreaker” by the excavators corresponded to a small alignment of medium-sized limestone blocks.

In addition to these structures, the archaeological bibliography of Quinta do Marcelo has consecrated the reference to “Bolsa 1” and “Bolsa 2”. These are not specifically mentioned in the fieldwork reports but are the most mentioned contexts in subsequent works. Therefore, and according to the information conveyed by the above-mentioned works, conducted after the fieldwork report, “Bolsa 1” is in square E12.2 (Fig.

5), while “Bolsa 2” is associated with two squares, the E12.3 and E12.4 (Barros 1992: 6). “Bolsa 2” also incorporates the bonfires (E12.4 and E12.3) and the so-called “windbreaker” (E12.3) (cf. Barros 1998: 30). “Bolsa 1” was considered older, and the report states that it overlapped “Bolsa 2”, adding that the collection of the latter is richer and more diversified (Barros 2000: 12).

As a matter of fact, the known radiocarbon dates reveal a slightly older chronology for “Bolsa 1”, clearly placing it in the Late Bronze Age (Tab. 1). “Bolsa 2”, on the other hand, although attributed to the Late Bronze Age, presents samples that could perfectly be associated with Iron Age.

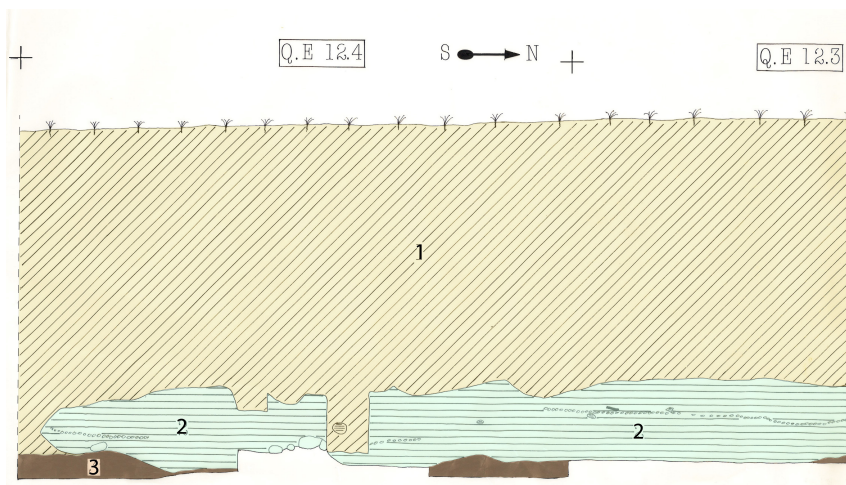


Fig. 3: Profile of Quinta do Marcelo, squares E12.3 and E12.4 (Drawing from the Almada Museum Archive).



Fig. 4: Combustion structure (E12.4) - top; Structure designated as a «windbreaker» (E12.3) during the excavation - below (Photo from the Almada Museum Archive).

Context	Sample	Sample code	Date BP	Date cal BC
Bolsa 1	Bones	ICEN - 943	2780±120	1373 - 596
	<i>Trochocochelea lineata</i>	ICEN - 945	3290±45	1054 - 796
	<i>Patella sp.</i>	ICEN - 947	3380±60	1216 - 855
Bolsa 2	Bones	ICEN - 924	2700±70	1014 - 773
	<i>Patella sp.</i>	ICEN - 920	3210±40	950 - 755
	Bones	ICEN - 923	2560±100	894 - 408
	<i>Patella sp.</i>	ICEN - 922	3170±50	946 - 668
	Bones	ICEN-927	2570±60	839 - 490

Table 1 – Radiocarbon dates from Quinta do Marcelo (after Soares and Arruda 2017).

2.1. Analysing “bolsas” 1 and 2

We should now take a moment to briefly discuss the terminology employed for the realities identified as “bolsas” in Quinta do Marcelo. Regarding the so-called “Bolsa 1”, photographs from the excavation provide evidence that seems to support the presence of a negative structure (Fig. 5), although without

any certainty due to the limited record. Although the available data is limited, it is also possible that the “Bolsa 1” corresponds to a reality like the one recognized as “pithouse” in Huelva (Gómez Toscano et al., 2014), even though it appears that the dimensions at Quinta do Marcelo are notably smaller in comparison.



Fig. 5: Two views of the square E12.2 – or “Bolsa 1”, with a large greyish area, perhaps a negative structure, and deposits with a rectangular shape, possibly associated with winemaking structures (Photo from the Almada Museum Archive).

In contrast, it is not so easy to identify a similar reality in the squares E12.3 and E12.4, associated with the so-called “Bolsa 2” (Fig. 4). In fact, the existence of a “debris pit” in this area had already been questioned precisely because of the high quality of the artefacts identified in it (Vilaça 2006: 92). Since one of the excavators wrote that “two other structures were found inside it, a bonfire and a windbreaker” (Barros 1992: 6), it becomes quite difficult to understand, from a stratigraphical point of view, how this area can be interpreted as a “disposal area”. Firstly, it is incongruous to have structures within a disposal area. Assuming that the disposal area/pit was later than the abovementioned structures, which is not presumed in any excavation records, the opening of a negative structure would quite likely have eliminated the pre-existences – thus, the bonfire and the stone alignment (“windbreaker”). The last option is supposing that the pit is older than the

other structures, being the latter of a different chronology. However, the field record itself attributed a single layer to all these realities (Layer 2), and its contemporaneity is always assumed (Fig. 3). Consequently, given the profile drawing that was made, and the field photographs available in the museum archive, it does not make sense to interpret this archaeological reality (“Bolsa 2”) as a proper “bolsa” – that is, as negative structure. Actually, it appears to be a broad term employed by the excavator to refer to a specific moment of occupation, which includes the bonfire and the stone alignment.

In any case, despite the apparent absence of a negative structure in squares E12.3 and E12.4 (“Bolsa 2”), we have maintained the use of the designations “Bolsa 1” and “Bolsa 2” in this work to facilitate the context analysis, since these are the names used in all the published works referring to Quinta do Marcelo.



Fig. 6: Square E12.4, with orange deposits tending to a rectangular and rounded shape, possibly associated with winemaking practice (Photo from the Almada Museum Archive).

2.2. Evidence of vineyard planting?

Field photographs also allowed us to find several deposits associated with negative structures with a regular plan in squares E12.2 and E12.4 (Figs. 5 and 6). These correspond to rectangular pits approximately 60 cm long and 20 cm wide, which seem to have coexisted with others, circular-shaped and around 35 cm across. We are unable to ascertain their complete depth, as the profile

drawing representing one of them lacks a scale (Fig. 3).

Based on the report left by the excavation directors, these negative structures cut through Layer 2 and, at least in one case, even reached the geological substrate, designated as Layer 3 (Barros and Sabrosa 1986: 2). Examining the currently available record, it is not possible to confirm where the top of these negative structures was, given that Layer 1

(approximately 1m thickness) was entirely removed by machinery, and the structures now under discussion were associated with Layer 1 and classified as “regular intrusions” of the latter (Barros and Sabrosa 1986: 2). Although these structures seem to be on the same plan as the combustion areas of the so-called Bolsa 2 in some photographs (Fig. 6), since these are negative structures “cutting through Layer 2” and given that the site was excavated in artificial levels (thus “slicing” the contexts throughout the excavation), it is also possible that these have a relation of posteriority with the other identified structures.

Regardless of the exact chronology of these structures, the morphological analysis of the pits identified in Quinta do Marcelo allows us to propose an association with vineyard planting. There are several parallels for this type of structures, from which we highlight the case of Orden-Seminario, Huelva, where winegrowing practices have been documented since the 9th to the 3rd century B.C.E. (Vera Rodríguez and Echevarría Sánchez 2013; Gómez *et al.* 2014; Echevarría Sánchez and Vera Rodríguez 2015). Structures with these characteristics were also identified in the Mediterranean area up to the Roman Era (Echevarría Sánchez and

Vera Rodríguez 2015: 58-59). Unfortunately, in the case of Quinta do Marcelo, these contexts were not excavated separately, so it is impossible to understand which artefacts were associated with those realities and therefore to determine their chronology. Nevertheless, its placement in the proto-historical period seems unequivocal, considering the remains identified at the site.

3. The artefact assemblage

Since its intervention in 1986, many works about Quinta do Marcelo have been published. However, they correspond to studies with broader thematic and geographic scopes (Cardoso 1999-2000; Melo and Senna-Martínez 2000; Cardoso 2004; Vilaça 2006; Vilaça 2008-2009; Valério 2012; Murillo-Barroso *et al.* 2018), highlighting a small part of the site’s artefact assemblage. We now present the entire collection, complementing its analysis with their collection context, whenever possible, contributing to a more detailed reading of the social and cultural dynamics that marked the area of the Tagus estuary in the late phase of the 2nd millennium B.C.E. and the first centuries of the following.

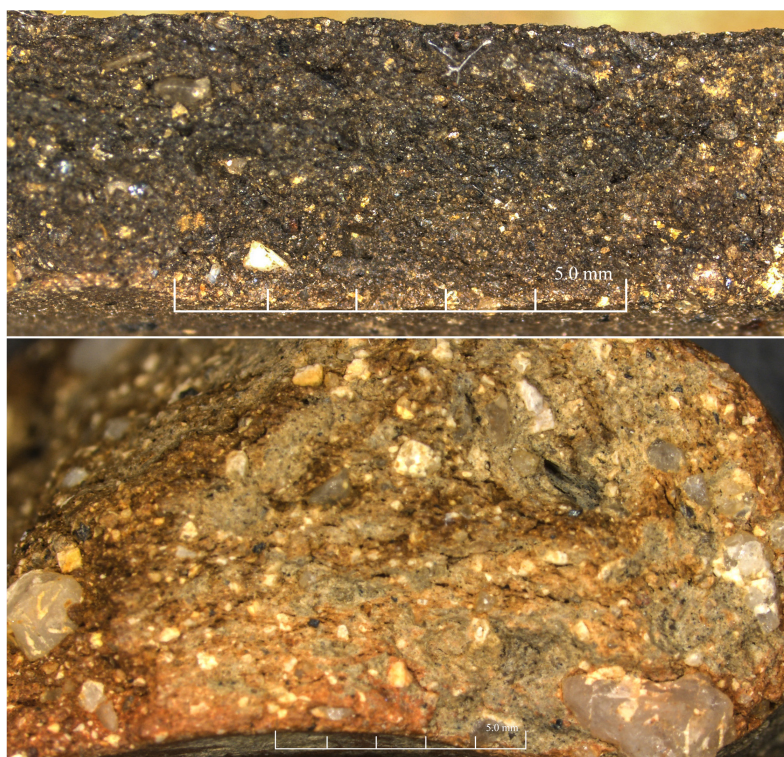


Fig. 7: Photographs of fresh breaks representing the main macroscopic fabric groups identified in Quinta do Marcelo.

It should be mentioned that, although we present all the site's artefacts, we have not accessed some of them for reasons beyond us. In those cases, we relied on the published studies and documentation from the Almada Museum archive to be able to include them in our global analysis. The assemblage also contemplates a considerable number of faunal remains, which shall be addressed in a future work.

The materials' presentation is made according to their context, since the two "bolsas" testify to two separate moments of occupation, a situation already confirmed not only by the fact that "Bolsa 2" overlaps "Bolsa 1", but also by their absolute dating.

The artefact assemblage collected in Quinta do Marcelo amounts to 259 pieces,

consistent with the typological and technological frames known for the Late Bronze Age and the Early Iron Age. Records refer to 232 ceramic vessels, 14 metal artefacts, 11 lithic ones, a decorated bone plaque, and an amber bead.

Regarding the morphological classification of the ceramic vessels, it stands out the high percentage of carinated cups, with 56%, while vessels generically classified as pots represent 22%. Cups with simple profiles are a minority, with just four fragments. Only one piece was classified as a plate, and one as a hemispheric bowl decorated with red and yellow paintings. The remaining 20% correspond to unclassifiable fragments.

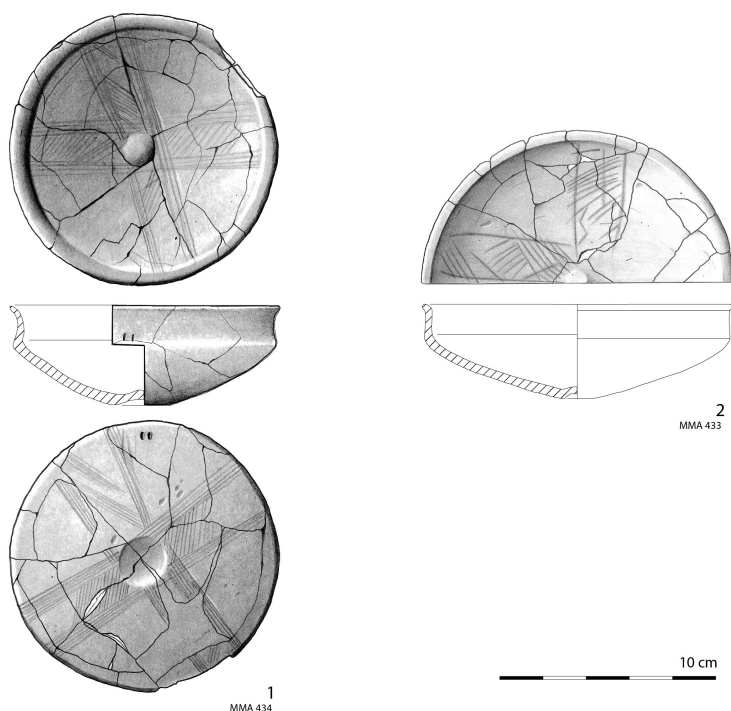


Fig. 8: Bowls decorated in pattern-burnished ornaments from Quinta do Marcelo (drawings by Inês Conde).

3.1. Square E12.2 - "Bolsa 1"

From the oldest context ("Bolsa 1"), there are 14 carinated cups, four with a complete profile, seven pots, and seven flat bottoms or foot-ring bases hard to classify.

All the carinated shapes identified in this area have the carination located in the middle or in the upper half of the vessels, an *omphalos* bottom and appear to have been carefully produced. The production is quite solid, compact, well-purified and homogeneous (Fig. 7). Regarding inlays, we find muscovites with variable sizes, angular or subangular quartzes that can reach 4 mm, feldspar and biotites, the

latter being somehow abundant. A few carbons, with around 1 mm, were occasionally identified. The firing process usually occurred in reducing environments, which resulted in dark tones to most vessels, varying between dark brown and black. Every piece was polished, thus gaining a shiny look and a silky touch.

The group of carinated cups identified in this area can be subdivided based on its morphology. The first subgroup comprises cups with everted rims, which may be bevelled (Fig. 7, n°1; Fig. 9, n° 1) or rounded (Fig. 9, n° 2), with diameters between 12.5 and 16 cm. The walls are concave up to the carinate, where the

body assumes a hemispheric profile down to the base. One of these pieces is decorated with identical burnished motifs on both faces (Fig. 8, n° 1). They are composed of two stripes intersecting in the middle, forming a cross that divides the vessel into quadrants. The stripes are delimited by straight parallel lines filled with thinner, diagonal strokes. While the

inner face is entirely decorated, the outer one is decorated just between the carinate and the bottom. Although the use of this technique in both faces is not very common in this area, there are parallels in Arraiolos (Almeida *et al.* 2012), Neves II (Maia 1986; Maia and Maia 1994) and Castro dos Ratinhos (Berrocal-Rangel and Silva 2010).

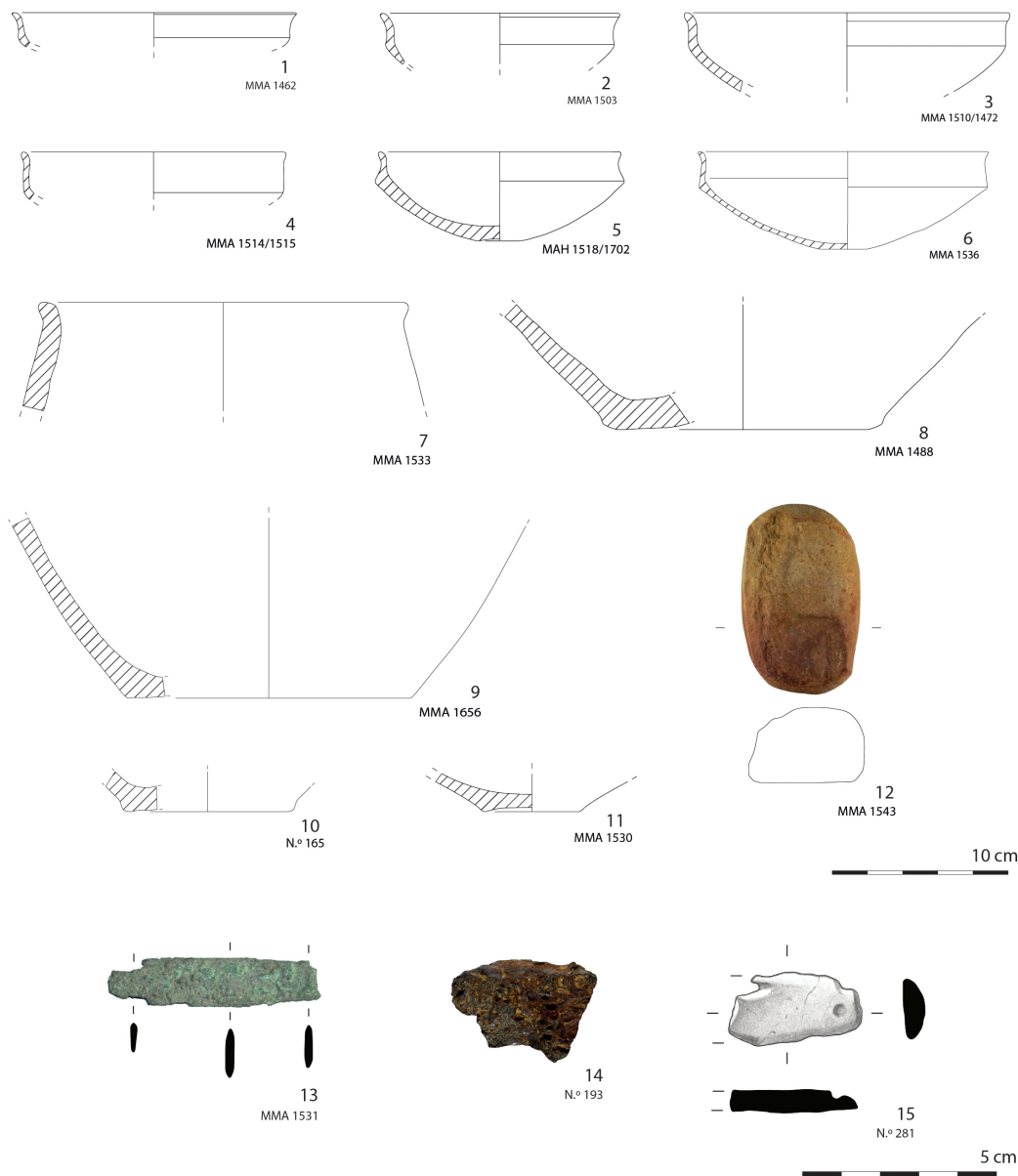


Fig. 9: Artefactual set of square E12.2 (“Bolsa 1”). Photograph n.º 13 taken from Valério (2012). Drawing n.º 15 by I. Conde.

The verticality of the upper part individualised three carinated cups identified in the same area. The morphology of these vessels finds parallels in the productions identified at El Carambolo, where smoother and less

angular keels are characteristic of the so-called Phase I. (Ruiz Mata 1995: 269; Fig. 7). The diameters are ranged between 14 and 18 cm, and the rims are round and slightly everted (Fig. 8, n° 2; Fig. 9, n° 3-4). One of these pieces

also has a burnished decoration, but just on the inner surface (Fig. 8, n° 2), which is consistent with the so-called “Andalusia group”, where this decoration model is well documented (Ruiz Mata 1995; Cardoso 2004: 185; Almeida 2014: 130). The presence of decoration exclusively on the internal face is extremely rare in the Lower Tagus, as noted by other authors (Cardoso, 2004, p. 185). There is only one known case, from Alcáçova de Santarém, although it corresponds to wheel pottery from the 6th century B.C.E. (Arruda, 1999-2000, p. 203, fig. 140). While there are similar examples in southern regions of Portuguese territory, as recently outlined by S. Almeida (2014, p. 144), such occurrences remain notably rare in this specific geographical area.

The third group is defined by cups whose rim diameter is smaller than the carination's, giving it a more closed appearance than the previous variants. This group is well illustrated by the piece MMA 1518/1702 (Fig. 9, n° 5), which preserves the entire profile and has an *omphalos* bottom.

The pots collected in “Bolsa 1” evidence a coarser production than the carinated cups, which should be related to their functionality. These large-capacity vessels have been associated with product storage, transportation, and food preparation. The surfaces were smoothed, and the *cepillo* technique was used in just two cases. Their morphology varied between sub-vertical or straight walls, being the rims everted (Fig. 9, n° 7), flattened or rounded. The MMA 1493 piece has an incised decoration in the rim, and the MMA 1477/1501 has a gripping element and undulations on the outer surface.

Regarding the metal artefacts, only a blade was recorded (Fig. 9, n° 13), probably belonging to a knife made of binary bronze (Valério 2012: 84-86). We also highlight an unpublished fragment, possibly slag (Fig. 9, n° 14), which has not yet been tested in the laboratory. We also identified a small metal fragment with a hole, apparently made of bronze (Fig. 9, n° 15), whose poor preservation state does not allow us to understand its function.

Regarding the lithic elements, only one was collected in this area, corresponding to a quartzite hand stone (Fig. 9, n° 12).

3.2. Squares E12.3 and E12.4 - “Bolsa 2”

From “Bolsa 2”, corresponding to squares 12.3 and 12.4, were recovered 36 carinated bowls, two of them with a complete profile, 21 pots, a plain bowl, three fragments of grey ware, typical of the Iron Age (two rims and a bulge), a rim of a Medellín type bowl, seven bottoms, and 11 unclassified rims.

The only bowl with a simple profile found in this area is a hemispheric vessel with a gripping element immediately below the rim (Fig. 10, n° 1).

The carinated cups collected in this area have the same techno-petrographic characteristics as the ones identified in “Bolsa 1”. In most cases, surfaces were polished. The manufacture is dark in the core and red or brownish on the outer surface. Inlays are small and relatively well-calibrated, especially the quartzes and the micas, from which biotite stand out due to their typical sheen and the contrasting tone with the pieces' surface.

Their morphology also does not differ from the scenario found in “Bolsa 1”. In fact, the vessels have tall or medium carination with diameters between 10 and 23 cm. The noticeable size difference of the vessels has been associated with their functions in the daily life of proto-historical communities (Vilaça 1995: 274). Opened vessels were identified, with various morphologies, although sharing everted rims, which can be rounded, flat or bevelled, and convex-concave walls (Fig. 10, n° 2-4).

The second group is composed of higher pieces, with tall carination and identical diameters in the rim and the carinate. Two have straight walls in the section between the rim and the carination (Fig. 10, n° 5-6), while the others are concave (Fig. 10, n° 7-11). Two bowls, MMA 1771 and MMA 1770 (Fig. 10, n° 6 and 7), preserve their complete profile, which confirms that the bottoms are *omphalos*-shaped. Three other *omphalos*-shaped bottoms were identified (Fig. 10, n° 12-14), with diameters between 2 and 5 cm, and were included in the carinated bowls group due to their production characteristics, which were identical to the latter, and also because the thickness of their sides does not seem compatible with other morphologies identified in the site of Quinta do Marcelo.

However, it seems strange that this area has no pattern-burnished decorated ceramic. Although this may suggest some sort of rupture with the previous moment, we cannot rule out the possibility that another decorated bottom, MMA 1786/ MMA 1788, whose context we do not know, could actually belong to “Bolsa 2”. Regardless, we must note that the percentage of these decorated elements is considerably small on the site.

Regarding pots, we found two separate productions. Three carefully manufactured pieces belong to the fabrication group defined for the carinated bowls, previously described. The walls are not very thick and are polished on both faces (Fig. 10, n° 15-16). These were very likely used as tableware, perhaps to serve

or liquids, which is consistent with the treatment to which the surfaces were subjected.

Pots of coarser production have sides approximately 10 mm thick, different profiles and diameters between 10 and 20 cm. The production is not very purified, being heterogeneous, and porous, and their tones range from brown to grey. Inlays are averagely distributed and poorly calibrated: some elements are smaller (especially micas), others medium (1 to 2 mm), and a few are large (the larger are 8 mm). There is a prevalence of quartzes (white, translucent, and pink), most of them angular, micas (muscovites and biotites), some calcites and feldspar. The cooling process seems careless since the pieces' surfaces show different colours, denouncing an irregular process.

Some vertical vessels with flat and everted rims were documented (Fig. 10, n° 17-20); while others have rounded rims, developing into an "S" shape (Fig. 10, n° 21). Only one rim fragment belongs to a closed vessel, with a spherical profile (Fig. 10, n° 22). The surface treatment of these vases was quite simple, by smoothing and using the "cepillo" technique in a few cases. Two fragments are decorated with undulations on the outer surface, one on the rim (MMA 1705), and the other on the wall (MMA 1733).

Some of these vessels were classified as cooking pots in the museum's inventory, possibly because their outer surface showed signs of fire exposure. However, although the same was verified in some of the pots we analysed, we should not be so preemptory to attribute them to that specific function based solely on the darker tone of some specific areas. In fact, this circumstance may be related to several factors, namely: the fabrication process itself, which may have been more irregular; exposure to fire after disposal; or, in the specific case of the rim area, sealing the vessels with perishable materials.

More difficult to interpret is MMA 1626, which has been mentioned in previous works (Barros 2000: 44-45; Cardoso 1999-2000: 387). It corresponds to a closed vessel with a globular body and a foot-ring base that stands out due to the multiple holes along the wall (Fig. 11, n° 1) and fit with the type H of D. Ruiz Mata (1995: 271; 279; Fig. 27, 1-3). Many functionalities have been ascribed to these

vessels, interpreted as "cheese-making utensils, honey strainers, lamps, metallurgy tools, recipients for storing embers, Bunsen beaks or incense burners" (Tews 2016: 135).

This specific piece was related to the cupellation of silver (Barros 2000: 13; Cardoso 1999-2000: 387; Cardoso 2004: 198), an interpretation originally proposed by Fernández Jurado (1986: 159-161) for these perforated vessels, which has been reiterated in specialised bibliography (cf. Ruiz Mata and Fernández Jurado 1986: 259; Fernández Jurado 1988-1989: 187; Ruiz Mata 1989: 227; Arruda 1993; Ruiz Mata 1995: 279; Arruda 1999-2000; Hunt Ortiz 2003: 366). In fact, similar vessels were recovered from metallurgical sites, such as San Bartolomé de Almonte (Fernández Jurado and Ruiz Mata 1986: 219), Vega de Santa Lucía, Fontanar de Cabanos-Colina (Murillo 1994: 310), and Mesa de Setefilla (Aubet *et al.* 1983: Fig. 38, n° 197-198), where a fragment associated with a nozzle was collected. In Peñalosa (García Sanz and Fernández Jurado 2000: lám. 20: 9), a perforated vessel was collected in Fondo 2, a context where two fragments of clay nozzles were identified (*ibidem*: 54).

We must also highlight the fragment from Quinta do Almaraz, a site located approximately 1.7 km away from Quinta do Marcelo, where metal production was also confirmed (Valério *et al.* 2003; Araújo *et al.* 2004; Valério *et al.* 2012; Melo *et al.* 2014). Nevertheless, in the case of Almaraz, the results of the laboratory analysis found no signs related to metallurgical activities (Melo *et al.* 2014: 704).

Thus, even though we admit these vessels may be related to metallurgical practices, we do not have irrefutable evidence that they are moulds to make cupels, as initially suggested (Fernández Jurado 1986: 159-161). If we examine the work of Georgius Agricola (1556: 229-230) or even Juan de Arfe (1572: 9), moulds with these characteristics are never mentioned. On the other hand, if we consider the cupels' raw material, we find that the vessels themselves should be perishable since they were made of drained ashes in order to absorb unwanted metals during the process. We cannot fail to mention that the deliberate destruction of these cupels was common practice as a way of recovering the metals they absorbed, such as lead.

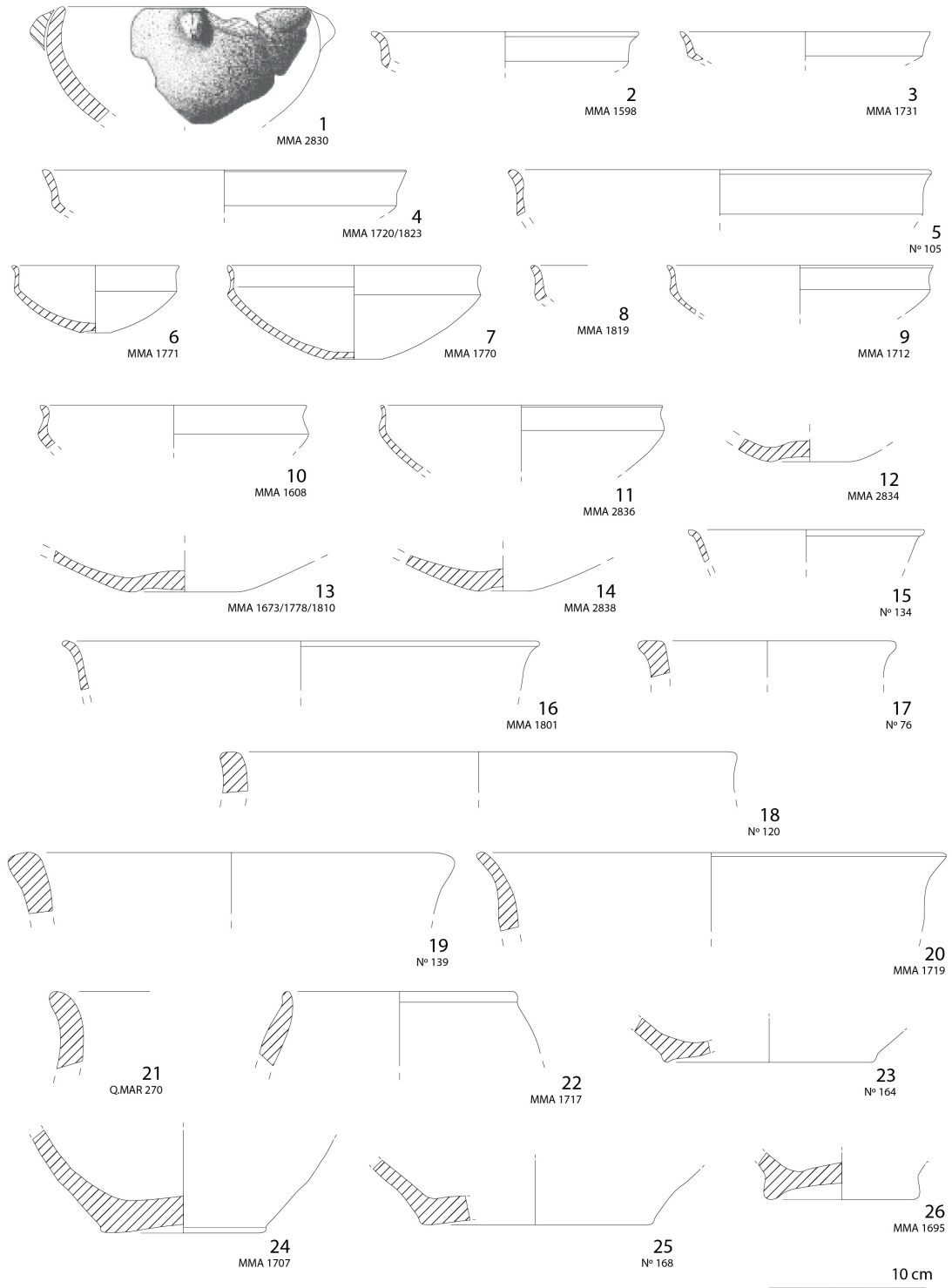


Fig. 10: Ceramic set of squares E12.3 and E12.4 ("Bolsa 2"). Drawing of no. 1 adapted from Barros (1998).

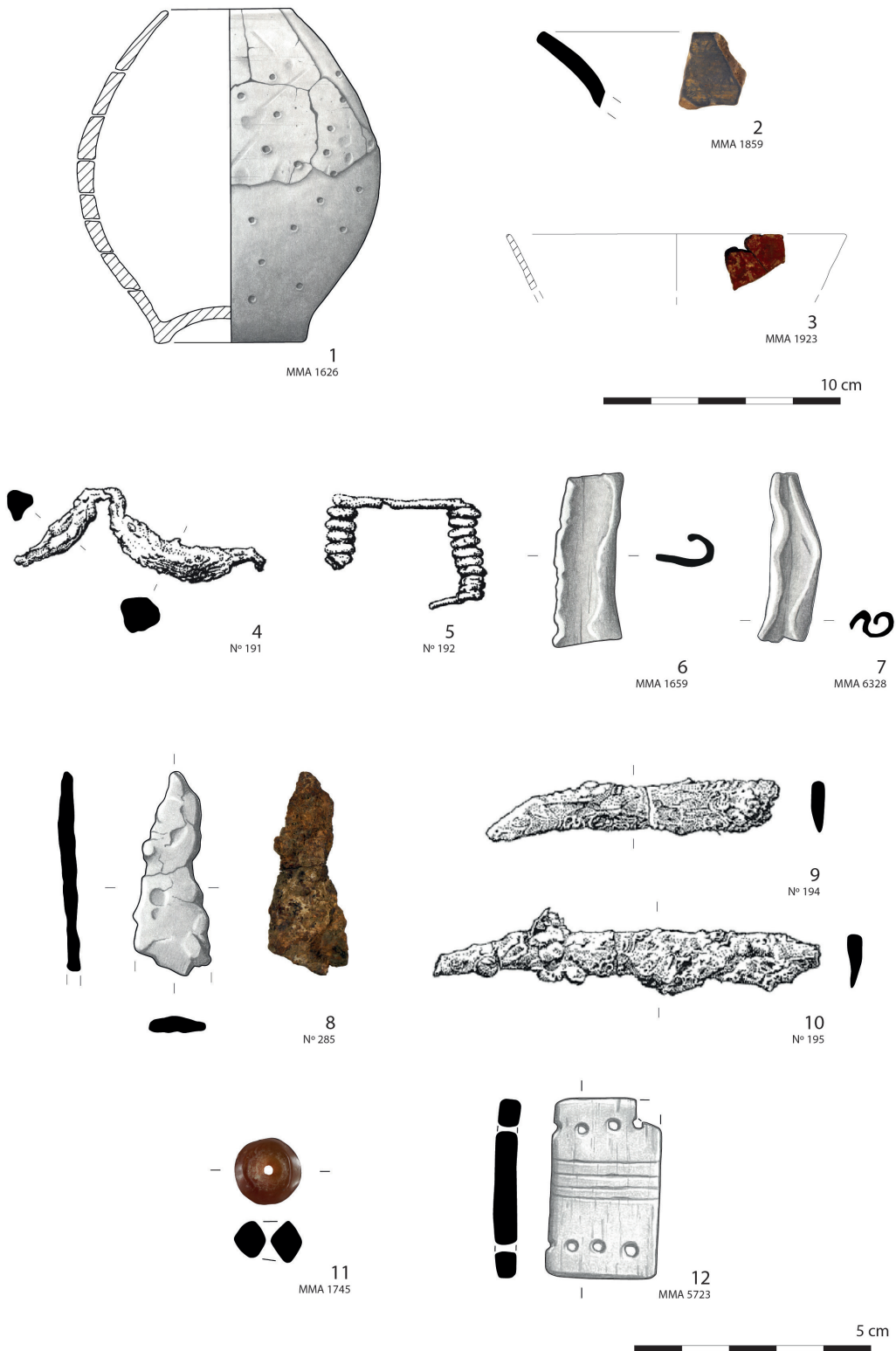


Fig. 11: Artefactual set of squares E12.3 and E12.4 (“Bolsa 2”). Drawings n.º1, 6, 7, 8 and 12 by I. Conde. Drawings n.º. 4, 5, 9 and 10 adapted from Cardoso (2004).

In addition to this assemblage, some fragments from ceramic vessels consistent with the Iron Age were identified. The first is a rim

fragment of a Medellín type painted ware (Fig. 11, n.º 3). It corresponds to a small, apparently hemispherical bowl with very thin walls and a

considerably purified dark grey paste. It is covered in red paint on both surfaces, with some traces of yellow paint overlapping the red on the inner surface, though its preservation status is insufficient to characterise the decorative motifs. Other examples of Medellín type ceramics in the Tagus estuary are already known, namely in Almaraz (one fragment) and particularly in Santarém, where 43 fragments were found (Arruda 2005; Arruda, Sousa and Dorado 2019). This type of ceramics began in the late 8th century B.C.E., although its production peaked in the next century (Arruda, Sousa and Dorado 2019: 133). Its presence in the Tagus estuary lasted until the beginning of the 6th century B.C.E., thus evidencing the relationship between this area and the interior of the peninsular territory, namely the areas of Medellín and the Southern Meseta (*idem*:142).

In addition to Medellín type ceramics, there are two rims and a bulge of grey ware pottery from the Iron Age. Due to their fragmentation state, it was only possible to draw a graphical representation of one of the fragments (Fig. 11, n° 2), corresponding to the rim of a carinated bowl with apparent parallels in the 3Fc shape defined by E. Sousa for the grey ware pottery of the Tagus, with a chronology centred between the 8th and 6th centuries B.C.E. (Sousa 2021: 144). We must highlight that grey ware pottery appeared in the Iberian Peninsula precisely in the end of the 8th century B.C.E., reaching its peak during the 6th century B.C.E. (Vallejo Sánchez 2015: 248). Although it is recorded both in environments connected to the colonial world and native nuclei, it is a ceramic category with a strong Phoenician influence. Together with Medellín type pottery, it reveals that the site of Quinta do Marcelo was occupied during the early stages of the Iron Age.

Regarding the metallic set associated with “Bolsa 2”, two fibulae of Mediterranean origin were identified. The elbow-type, with a multi-curvilinear bow, can be associated with the Cassibile III type (Fig. 11, n° 4), which is not common in Portuguese territory, where *ad ochio* type predominates. They are mainly present in Beiras, although the example from Abrigo Grande das Bocas (Carreira 1994: Est. XXXIII, n° 1) and the one from Arraiolos (Carreira 1994, Fig. 9, n° 1) prove a relatively wide distribution. The known parallels, peninsular and eastern, validate a chronology centred between the 10th and the 9th centuries B.C.E.

The double spring fibulae (Fig. 11, n° 5) is part of the Ponte 3 type (Ponte 2006, 95-111), and corresponds to a common model from the 8th century B.C.E., appearing in contexts that may be considered as an advanced stage

of the Late Bronze Age - reaching, however, the following century, and thus the Iron Age. The geographical distribution of specimens with more archaic characteristics, of variant 3a, is quite vast (Arruda, Vilaça, Gomes 2022: Fig. 1). However, those that fit into 3b of Ponte are mainly present on the coast, with a special incidence in Baixo Tejo and the Mondego estuary, the most orientalized areas of the Far West, although it should be mentioned its presence in some funerary environments in the interior of Alentejo (*ibidem*). For obvious reasons, namely geographical ones, special reference is due to the pieces from Almaraz (Cardoso 2004, Fig. 158 n° 2 and 3), from Abul (Mayet and Silva 2000, Fig. 46, n° 351) and Lapa da Cova (Calado et al. 2017).

Also from this area are two net weights made of lead (Fig. 11, n° 6-7), three knife blades made of iron, two already published (Cardoso 2004: 213), and another unpublished until now (Fig. 11, n° 8). The three blades seem to correspond to small falcata-shaped knives, common artefacts at the change of the millennium (Vilaça 1995; Vilaça and Arruda 2004: 21; Vilaça 2006: 93). We only had direct access to the unpublished one (N° 285), of which only 4,4 cm are preserved. According to the published drawings, the two already known knives are approximately 6 cm (Fig. 11, n° 9) and 8 cm length (Fig. 11, n° 10). Although the presence of bronze rivets was mentioned for both items (cf. Melo and Martínez 2000: 101), these were not mentioned by the excavators (cf. Barros 1992, 2000) nor visible in the published drawings.

The chronology of contexts in which the initial iron artefacts were found in Portuguese territory reveals a circulation phase prior to the Iron Age, being the first items found in environments of the 11th century B.C.E. (Vilaça 2013: 638). However, the use of falcata-shaped knives, which seem to be of Eastern Mediterranean origin, is documented in an extensive chronology and geography (Mancebo 2000; Grevey and Gailledrat 2020), including in the advanced stages of the Iron Age, as confirmed by the presence of a local piece from contexts of the 6th/5th century B.C.E. in Cacilhas (Olaio *et al.* 2019). Regarding the typological frame, the two most complete items from Quinta do Marcelo share similarities with the Type 1 defined by Lorrio, which is characterised by a straight design of the blade and only bends in the final section (Lorrio 2008: 567-569). The most fragmented blade may also belong to this Type, although its preservation state does not allow for a safe typological adscription.

From a functional point of view, falcata-shaped knives have been interpreted as

prestigious objects, either of ritual character (associated with food preparation in feasts, for example) or funerary (i.e., associated with burials), as weapons, or as personal belongings for daily use (Mancebo 2000; Lorrio 2008; Mateos Leal and Sánchez Nicolás 2014). Given these items' dimensions, their use as weapons does not seem appropriate. As for the remaining hypothesis, none can be ruled out in the case of the set from Quinta do Marcelo. It is pertinent to recall that a practical use of the objects in daily activities is not incompatible with an eventual symbolic value (ritual and/or prestige) because the "artefacts' value is not inherent but rather created by culture, and therefore changeable" (Vilaça 2006: 96).

Unfortunately, we do not have chemical analyses that consent the identification of the origin of the iron artefacts from Quinta do Marcelo. It should be recalled that this type of approach allowed to verify that the iron from the late Bronze Age sites of the Portuguese Beiras, well dated between the 12th and 9th centuries B.C.E. (Vilaça 2013), was produced using local iron deposits (Jambom *et al.* 2023). From a technological point of view, analysis revealed little control over the various purification stages, unlike those of the Eastern Mediterranean (*ibidem*: 116), and differentiating themselves, on the other hand, from those from the local Iron Age, specifically the specimen from Cachouça, an Iron Age site (*ibidem*: 110), but also from the Baiões piece (*ibidem*: 116).

An amber bead approximately 1 cm wide and with a central hole (Fig. 11, n° 11) was also recovered in this context. This artefact was submitted to laboratory analysis using FTIR spectroscopy, whose results attribute the provenance of its raw material to the Baltic region (Murillo-Barroso *et al.* 2018: 18). In fact, the first signs of exogenous amber in the Iberian Peninsula apparently emerged in the 5th millennium B.C.E., being their symbolic attributes transferred to other materials - especially metal - during the early stages of the Bronze Age (*ibidem*: 29), which translates into a significant reduction in the use of amber in peninsular contexts. Contrary to the panorama seen in the Iberian Peninsula, we know that amber was widely used in Greece and Italy during that same period (Harding and Hughes-Brock 1974; Sabatini and Melheim 2017), being associated with the construction of the Mycenaean hero on a first instance, and having later acquired a cosmological connotation (Maran 2013: 161).

Some authors relate the reintroduction of Baltic amber in the Iberian context during the Late Bronze Age precisely to contacts with

the Central Mediterranean. As a matter of fact, the presence of that raw material was also associated with the appearance of the first iron artefacts, at least in the Peninsular Southwest (Murillo-Barroso 2018: 30), as can be verified in Palacio III, Seville (Murillo-Barroso *et al.* 2015: 330), in Moreirinha and Senhora da Guia, besides the case of Quinta do Marcelo (Vilaça *et al.* 2002: 67-69). The ritual aspects connected with amber bead necklaces are well documented due to their significant association with the funerary world, but also because of the intentional deposition of these necklaces in environments that can be considered votive, as is the case of Cabecinho da Capitôa (Sousa *et al.* 2022).

It should also be mentioned that the frequency of Baltic amber beads, especially in the Southern region of the Iberian Peninsula, seems to have grown significantly over the first millennium B.C.E. (Murillo-Barroso *et al.* 2018: 30). This situation can also be related to a closer relationship with the Central Mediterranean, thus indicating that the Baltic amber quite probably arrived through that route and not by direct contact with northern Europe (Murillo-Barroso and Martín-Torres 2012), a situation that was not unheard (Vilaça 2007: 141).

A decorated bone plaque was also collected in this "Bolsa 2" (Fig. 11, n° 12). It measures 2 cm wide by 4 cm long and is decorated with four incised lines in the central area. Both extremities have three holes each, and one of the sides shows two dips with the same orientation as the holes. Although we have not identified parallels for this artefact, their association with clothing or adornments does not seem unreasonable, especially if we consider its small size and that the holes allowed it to be mounted using strings.

In addition to this set, we identified a small lithic collection. Cutting byproducts (primarily flint and quartzite chips, in addition to some nuclei) were not included in this analysis and still await a detailed formal and traceological study. Regarding chipped and polished stone tools, we identified two flint sickle elements (Fig. 12, n° 1-2) and five quartzite handstones (Fig. 12, n° 4-8). A quartzite artefact with a hole (Fig. 12, n° 3) was also collected, which may have been used as a net weight.

The scarce presence of sickle elements, which we expected to be significant in a site located at a low altitude and in a favourable area for agriculture, is also noteworthy. On the other hand, there is a relatively good representation of handstones, revealing a possible development of grain milling at the site, although no quern-stones were found.

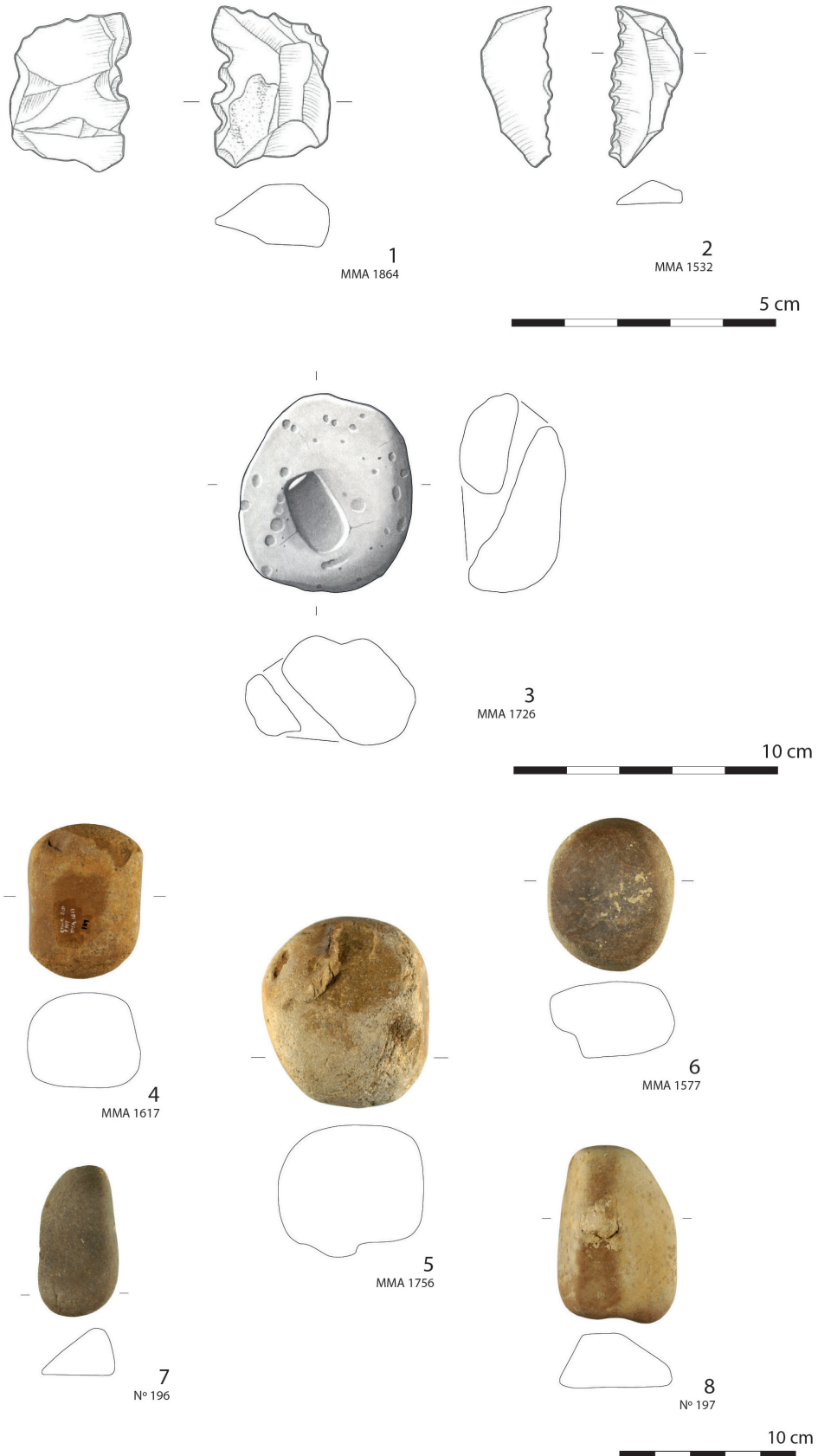


Fig. 12: Artefactual set of squares E12.3 and E12.4 ("Bolsa 2"). Drawings n.º 1, 2 and 3 by I. Conde.

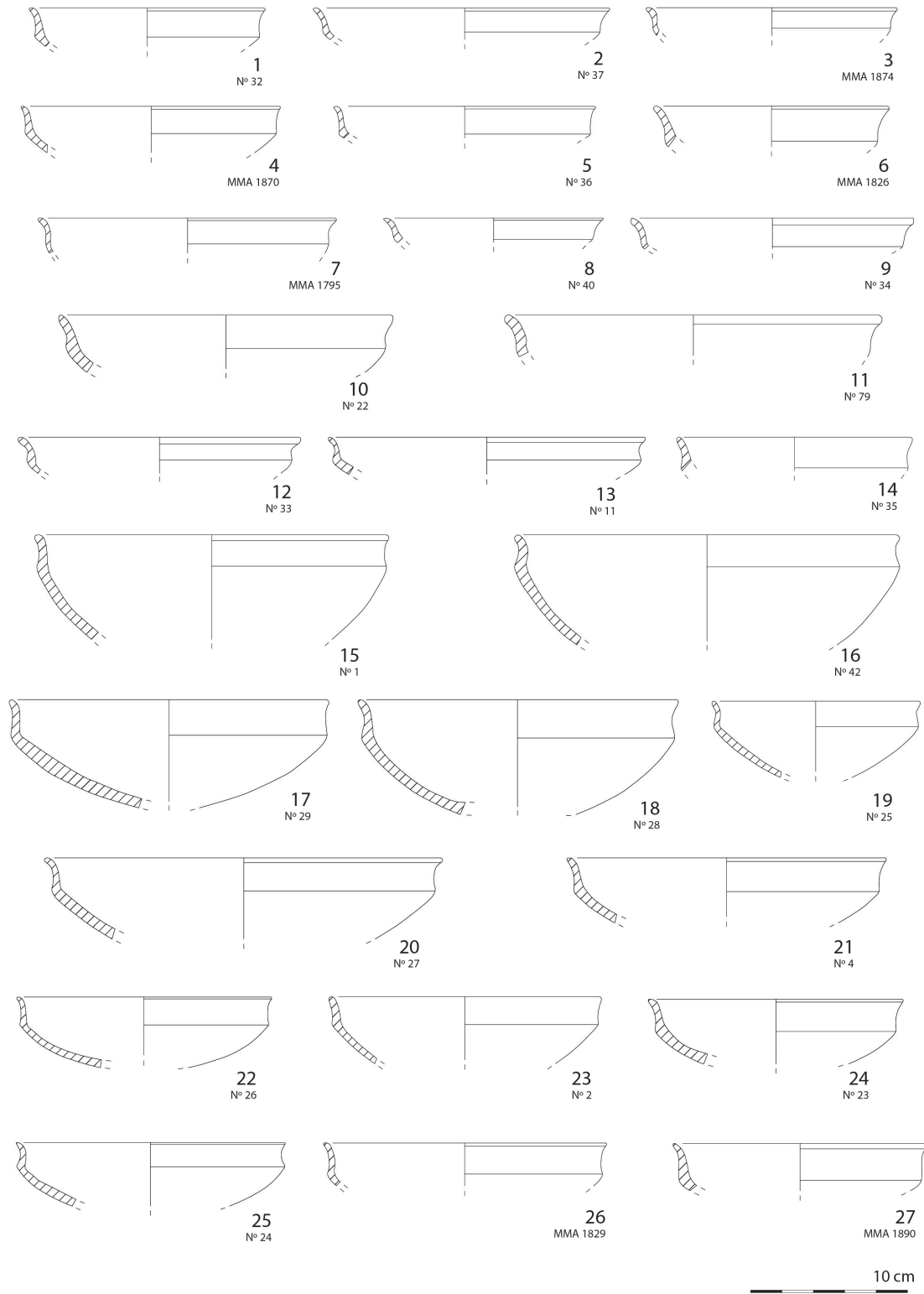


Fig. 13: Artefacts of indeterminate context.

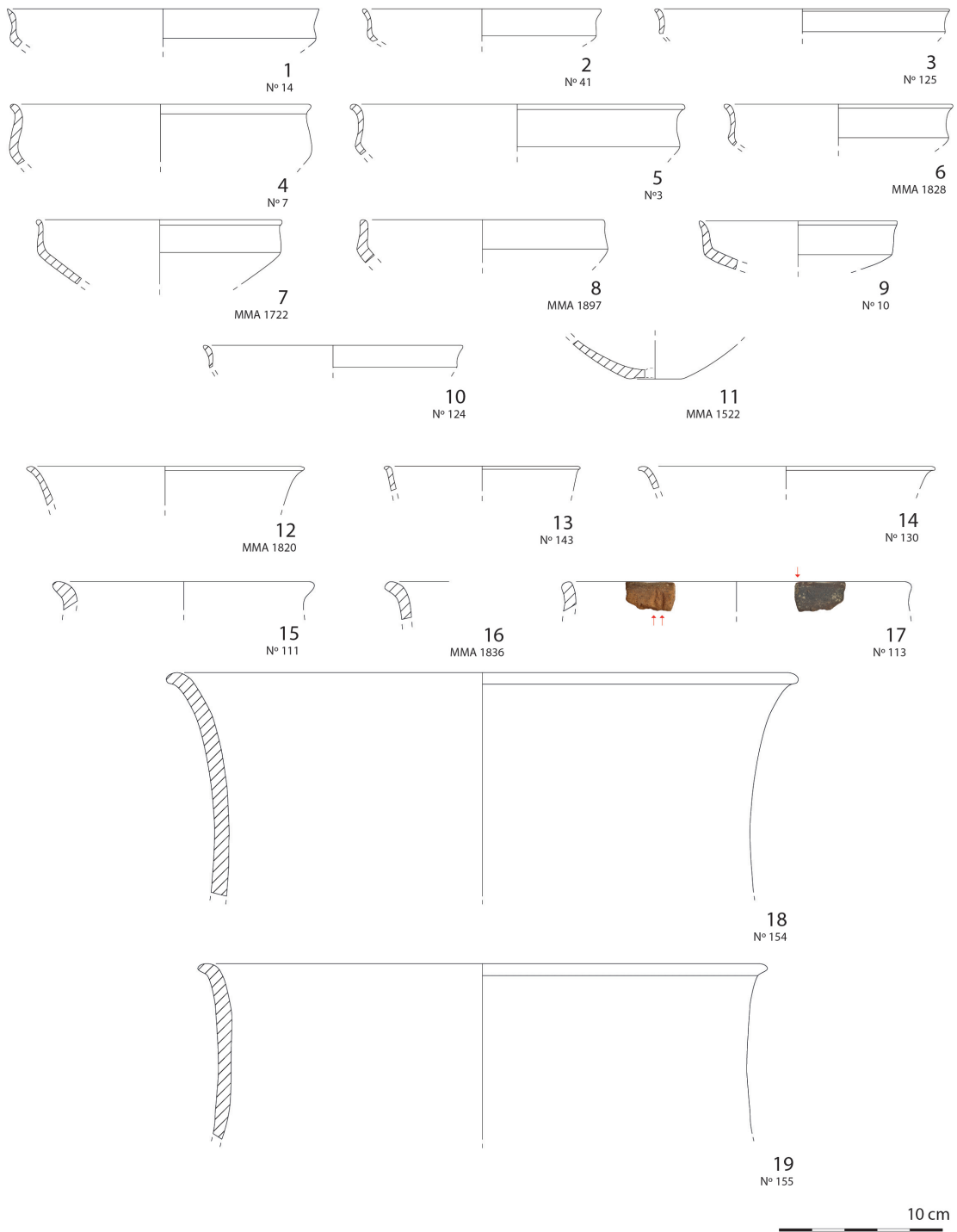


Fig. 14: Artefacts of indeterminate context.

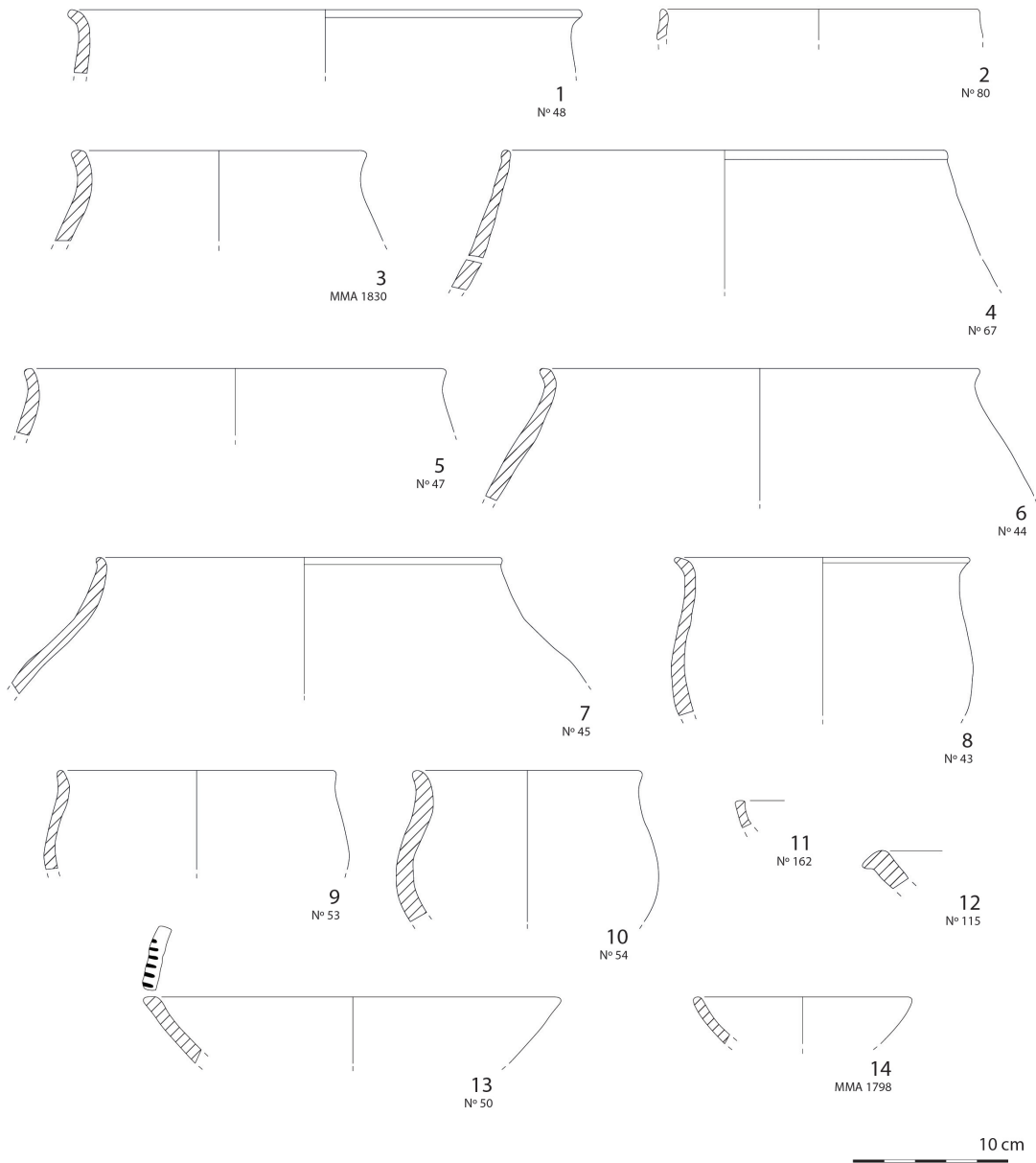


Fig. 15: Artefacts of indeterminate context.

3.3. Artefacts without context

Regrettably, we do not know the context of many artefacts. This concerns 78 carinated cups, 21 pots and three cups with simple profiles. Also, four fragments were collected on the surface, namely a carinated bowl with a burnished decoration in its inner face, identical in shape and decoration to those collected in “Bolsa 1”, described and discussed above.

The carinated cups preserve the morphological characteristics found in the two excavated areas, corresponding to vessels with medium and tall carinate, more open or with a vertical tendency (Fig. 13; Fig. 14, nº 1-10). An *omphalos* bottom preserves burnished motifs on its outer face, although quite faded due to surface wear.

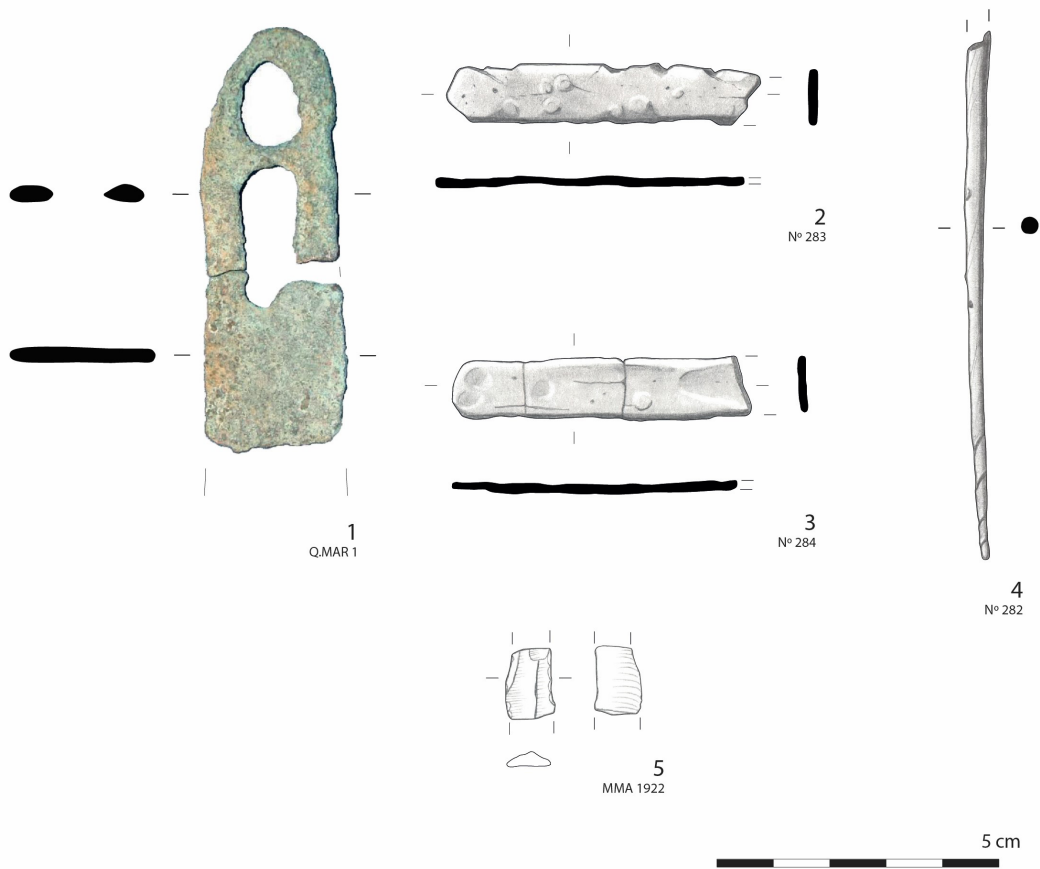


Fig. 16: Artefacts of indeterminate context. Drawings n.º 2 to 5 by I. Conde. Photograph n.º 1 taken from Valério (2012).

As for the pots, three have thin walls and belong to the same production group of the carinated cups, i.e., their careful manufacture is compatible with drinking or serving liquids (Fig. 14, n.º 12-14). The others, more coarsely made, have multiple morphologies. Some vases with everted rims and vertical walls were recorded (Fig. 14, n.º 15-19; Fig. 15, n.º 1-2). Others are closed, with sub-vertical (Fig. 15, n.º 3-5) or curvier walls (Fig. 15, n.º 6-7), being the piriform pots a minority (Fig. 15, n.º 8-10). Noteworthy is the presence of vessels with very large diameters, some nearly 50 cm wide, which did not happen to the vessels accompanied by contextual information.

Simple bowls include pieces with arched walls (Fig. 15, n.º 11 and 14), and only one has straight walls and incisions on the rim (Fig. 15, n.º 13). Also noteworthy is the fragment of a bowl's bottom "which, through an XRF analysis performed at the Technologic and Nuclear Institute, revealed the existence of Mercury and Gold" (Barros 2000: 13). We do, however, regret that this piece's whereabouts is

unknown and that we could not access more detailed information about its analysis, results, or characteristics.

In addition to these artefacts, some metallic elements were collected in an unknown context, namely a bronze tranchet (Fig. 16, n.º 1), which was properly contextualised in a work conducted by Raquel Vilaça (2008-2009). Usually associated with cutting leathers and hides (*ibidem*: 73-74), tranchets are unusual in coastal contexts and more frequently found in the centre of the Portuguese territory and western Extremadura (*ibidem*: 73 and 79). Chronologically attributed to the final moments of the Bronze Age – 11th-9th centuries B.C.E. (*ibidem*: 71) –, these pieces are primarily identified in settlements, and although they appear with some frequency in sites with Mediterranean elements, they notably reveal the connections with inner areas of the territory (*ibidem*: 73). The tranchet of Quinta do Marcelo was analysed by Pedro Valério (2012), who identified a typically indigenous metallurgy of binary bronzes (*ibidem*: 83-84). However,

given the significant presence of iron in the tranchet (0.25%), higher than in the remaining Late Bronze artefacts that were analysed, it may be from a slightly later chronology, even though the author does not insert it in the Iron Age (*ibidem*: 84).

Also documented, but without context, “two overlapped bronze blades” (Barros 2000: 44) (Fig. 16, n° 2-3), which, although appear in the cited work’s catalogue, are not mentioned in the text about the site; and a bronze needle, also of unknown provenance (Fig. 16, n° 4).

Finally, we should mention the collection of a sandstone hand stone and a flint blade with no associated context (Fig. 16, n° 5).

4. Discussion

The unfavourable excavation circumstances at Quinta do Marcelo, typical of fieldwork in construction contexts, and the absence of more archaeological data, like domestic structures or clear production and/or transformation contexts, does not consent a detailed interpretation of the site’s occupation. Nonetheless, researchers have presented many theories on its functionality. It was interpreted as a seasonal camp dedicated to gold exploration on the Tagus bank, which would be proved by the metal strainer and the metallic traces of mercury and gold found at the bottom of a bowl (Barros 2000; *vide supra*); as a place dedicated to the “first beach exchanges with the Phoenicians”, which could be demonstrated by the remains’ exceptional character (Barros 1998); and as an agricultural site, due to its location in low levels and the absence of defensive concerns (Cardoso 1995; Vilaça and Arruda 2004). More recently, the site’s role in regional economic strategies was highlighted, given the possibility of metallurgical activities on the site, along with the exceptional character of the artefact assemblage, that would place Quinta do Marcelo in a privileged situation in Atlantic and Mediterranean trade routes (Sousa 2016).

Although we do not disagree with the theories proposed by the mentioned authors, in light of the new data, presented in this work, some insights should be taken in consideration.

While, on the one hand, the hypothesis of this being a site dedicated to gold exploration and gold and silver transformation (Barros 2000) seems promising, the arguments used to sustain it are debatable. In fact, the perforated ceramic vessel, used to support the idea that cupels were made at the site, could actually be used for multiple functions. Thus, it would be crucial to the discussion the

recovering of the abovementioned ceramic bottom with gold traces, whose whereabouts are currently unknown. On the other hand, the identification of a possible slag fragment should not be overrated in this discussion. Conducting economic/artisanal activities in domestic environments was relatively common during Proto-History, so this isolated element should not be considered decisive to understand the site’s functionality.

Notwithstanding, the site’s connection to agricultural activities seems evident. The site’s high exposure to the valley and the absence of defensive concerns are undeniable. Although not very expressive, the artefact assemblage suggests some agricultural production on the site (we recall the presence of sickle elements and the eight hand stones), although on a scale hardly comparable to other settlements located on the river’s north bank, where the presence of elements associated with these activities is far more clear.

On the other hand, the net weights can also point to the exploration of maritime resources, as proven by the site’s zooarchaeological data, which highlights the significance of gastropods and bivalves retrieve and shall be published soon.

Although we cannot highlight any specific production activity based on the artefact assemblage, we must underline the identification of pit-like structures, possibly associated with wine production. Although these elements were not isolated during the archaeological intervention, since they were considered part of Layer 1 according to the excavation record, the negative structures clearly cut through Layer 2 (where the structures associated with the so-called “Bolsa 2” were identified). Furthermore, the presence of knives, which are versatile tools, may have also been linked to this activity (as pruning tools), as it was proposed for similar artefacts in other contexts (Lopez Castro 2008: 167; Diloili *et al.* 2021: 52). However, the available records do not provide enough information to ascertain whether these structures were utilized at the same time as those identified in “Bolsa 2”. Thus, lacking further data, it is not possible to determine an exact chronology for their opening and use.

Nonetheless, given the artefacts collected at Quinta do Marcelo and what we already know regarding the Huelva area, it is plausible to associate these structures with a proto-historical occupation, namely to the Iron Age. In fact, the first evidence of vineyard planting in the current Portuguese territory had already been commented on (Arruda and Gonçalves 1995: 24), referring precisely to the Tagus River

Valley during the Iron Age. However, until now, those data consisted of indirect testimonies (Barros 1994; Kalb and Höck 1988), making Quinta do Marcelo the oldest site with structures associated with this production in the westernmost coast of the Iberian Peninsula.

In short, interpreting data from Quinta do Marcelo, even with a complete analysis of the artefact assemblage, is not an easy task, especially if we consider the small area excavated and the limited stratigraphic record. On the other hand, while the site was unmistakably interpreted as a Late Bronze occupation in the Tagus Valley, this may now be re-evaluated.

According to the data set we examined, especially regarding the so-called “Bolsa 2”, the site’s occupation lasted until the first centuries of the first millennium B.C.E., as radiocarbon dates and the presence of a double spring fibula already suggested. The identification of a Medellín type fragment and at least three grey ware fragments now reinforce this possibility. Therefore, it seems necessary to re-evaluate the chronology attributed to some artefacts of Mediterranean origin collected at Quinta do Marcelo, as is the case of the fibulae, especially the double spring one, and the irons themselves, also taking into account the 14C dates themselves, as was already mentioned in a study co-signed by the last signatory of this work (Soares and Arruda 2017: 243).

In fact, all the radiocarbon dating ranges available for Quinta do Marcelo “Bolsa 2” allow its occupation to be extended up to, at least, the beginning of the 8th century B.C.E., in radiocarbon chronology, even if calibrated using the Bayesian model (Soares and Arruda 2017: 244, Table 3). Note, on the other hand, that they do not differ substantially from those obtained for Quinta do Almaraz (*Idibem*: 241-242, Table II).

Nevertheless, there is no doubt that the site known as Quinta do Marcelo was occupied during the Late Bronze Age. The vessels’ shapes, especially the carinated bowls that can be perfectly associated with A.I.a, A.I.b and B.I. types defined by D. Ruiz Mata (1995: 269; Fig. 7) and fit the “Horizonte Clásico” proposed by F. Gómez Toscano, who dates it between 1000 and 750 a.n.e. for the Huelva

region (2008: 93), as well as the decorations (pattern-brushed ornaments), the multi-curvilinear bow fibula, the sickle elements and the radiocarbon dates obtained for bones recovered in “Bolsa 1” leave no room for doubt regarding that occupation. However, it is now also evident that the site’s occupation continued at least until the beginning of the Iron Age.

This is demonstrated, once again, by the absolute chronology and by some of the artefacts recovered in “Bolsa 2”, being the presence of ceramics of ancient tradition in the initial moments of the Phoenician occupation common in identical contexts on the peninsular territory (Arruda 1999-2000).

Perhaps more difficult to explain is the abandonment of the site in the first half of the 1st millennium B.C.E. (7th/6th centuries B.C.E.), since it is to this chronology that the later identified materials point (grey ware, Medellín type pottery, double spring fibula), especially if we consider the possible use of the area for viticulture practices.

However, in this equation it cannot be forgotten that Quinta de Almaraz, which is only 1.7 kilometers away from the site, have certainly played an important role in coordinating and organizing its surrounding territory, where Quinta do Marcelo was certainly included.

But these and other questions can only be resolved with new fieldwork, more controlled from a stratigraphic point of view and more extensive in area.

Acknowledgements

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Bibliography

- Agricola, G. (1556): *De Re Metallica*.
 Almeida, S. (2014): Estilos e tendências na cerâmica de ornatos brunidos do Sudoeste Peninsular. *Idade do Bronze no Sudoeste: Novas perspectivas sobre uma velha problemática* (R. Vilaça, M. Serra, coords.), Coimbra: 129- 147.
 Almeida, S.; Silva, R.C.; Osório, A. (2012): O povoado de S. Pedro de Arraiolos (Alentejo) – Novos dados para o seu conhecimento. *Sidereum Ana II – El rio Guadiana en el Bronce Final* (J. Jiménez Ávila, ed.), Anejos de AEspA, LXII, Mérida: 229-247.

- Alvar, J. (1997): El problema de la precolonización en la gestación de la polis. Imágenes de la polis (J. Alvar, D. Suárez, J. Casillas, C. Vaquero, coords.), Ediciones Clásicas, Madrid: 19-33.
- Alvar, J. (2008): Modos de contacto y medios de comunicación: los orígenes de la expansión fenicia. *Contacto cultural entre el Mediterráneo y el Atlántico (siglos XII-VIII a.n.e.)*. La precolonización a debate (S. Celestino, N. Rafel, X.-L. Armada, eds.). Consejo Superior de Investigaciones Científicas, Madrid: 19-25.
- Araújo, M.^a.F.; Barros, L.; Teixeira, A.N.E.; Melo, A.Á. (2004): EDXRF study of Prehistoric artefacts from Quinta do Almaraz (Cacilhas, Portugal). *Nuclear Instruments and Methods in Physics Research*. 213: 741-746. [https://doi.org/10.1016/S0168-583X\(03\)01696-3](https://doi.org/10.1016/S0168-583X(03)01696-3)
- Arfe, J. de (1572): *Quilator de la plata, oro y piedras*. Madrid.
- Arruda, A. M. (1993): A ocupação da Idade do Ferro na Alcáçova de Santarém no contexto da expansão fenicia para a fachada atlântica peninsular. *Estudos Orientais - Os Fenícios em Portugal*. IV: 194-214.
- Arruda, A. M. (1999/2000): *Los Fenicios En Portugal: Fenicios Y Mundo Indígena En El Centro Y Sur De Portugal (Siglos VIII-VI Ac)*. Universidad Pompeu Fabra, Barcelona: Carrera Edició. (Cuadernos de Arqueologia Mediterránea).
- Arruda, A. M. (2005): Orientalizante e pós-orientalizante no sudoeste peninsular: geografia e cronologias. *El Período Orientalizante: Actas del III Simposio Internacional de Arqueología de Mérida, Protohistoria del Mediterráneo Occidental* (S. Celestino, J. Jiménez Ávila, eds.), Mérida, Vol. 1: 277-303.
- Arruda, A. M. (2017): A Idade do Ferro Orientalizante no vale do Tejo: as duas margens de um mesmo rio. Territorios comparados: los valles del Guadalquivir, del Guadiana y el Tajo en época tartésica. *Tartésica* (S. Celestino Pérez, Esther Rodríguez eds.), Mérida: 283-294.
- Arruda, A. M.; Gonçalves, V. S. (1995): Produção e consumo de vinho no território actualmente português durante a Idade do Ferro. *Amar Sentir e Viver a História. Estudos de Homenagem a Joaquim Veríssimo Serrão*, Lisboa: 21-27.
- Arruda, A.; Sousa, E.; Pimenta, J.; Soares, R.; Mendes, H. (2017): Fenícios e indígenas em contacto no Estuário do Tejo. *Ophiussa*, 1: 79-90.
- Arruda, A.; Sousa, E., Dorado, A. (2019): As cerâmicas pintadas de fabrico manual da Idade do Ferro na Foz do Tejo. *Las cerámicas a mano pintadas postcocción de la Península Ibérica durante la transición entre el Bronce Final y la I Edad del Hierro* (E. Rodríguez González and S. Celestino, eds.). Instituto de Arqueología de Mérida, Mérida: 131-144.
- Arruda, A. M.; Vilaça, R.; Gomes, F. (2022): Ornamentos de vestuário orientalizantes en Portugal una panorámica de la situación actual. *Problemas de cultura material: ornamentos y elementos del vestuário en el arco litoral Mediterráneo-Atlántico de la Península Ibérica durante la Edad del Hierro (ss. X-V a.C)* (Graells i Fabregat, R.; Camacho Rodríguez, P.; Lorrio Alvarado, A. (coords.), Alacant: 83-118.
- Aubet, M.^a.E.; Serna, M.^a.R.; Escacena, J.L.; Ruiz, M.M.^a. (1983): *La Mesa de Setefilla. Lora del Río (Sevilla). Campaña de 1979*. Madrid.
- Barros, L. (1992): *Qta. do Marcelo: Um acampamento na charneira do Bronze para o Ferro*. Lisboa.
- Barros, L. (1998): *Introdução à Pré e Proto História de Almada*. Almada.
- Barros, L. (2000): *O fim do Bronze e a Idade do Ferro no território de Almada*. Faculdade de Letras da Universidade de Lisboa, Lisboa.
- Barros, L.; Sabrosa, A. (1986): *Quinta do Marcelo (Almada, Setúbal): Relatório de trabalhos arqueológicos*. Almada.
- Barros, L.; Espírito Santo, P. (1991). Quinta do Percevejo – Almada. Uma intervenção de emergência. *Actas das IV Jornadas Arqueológicas (Lisboa 1990)*. Lisboa: 333-343.
- Barros, L.; Cardoso, J. L.; Sabrosa, A. (1993): Fenícios na margem Sul do Tejo. Economia e integração cultural do povoado de Almaraz – Almada. *Estudos Orientais*, IV: 143-173.
- Berrocal-Rangel, L.; Silva, A.N.E. (2010): *O Castro dos Ratinhos (Barragem do Alqueva, Moura). Escavações num povoado proto-histórico do Guadiana, 2004-2007*. O Arqueólogo Português, Suplemento 6, Lisboa.
- Boissinot, P. (2001): Archéologie des vignobles antiques du sud de la Gaule. *Galia*, 58: 45-68.
- Botto, M. (2014) - *Los fenicios en la bahía de Cádiz. Nuevas investigaciones*. Collezione di Studi Fenici, 46, Roma.
- Calado, M.; Gonçalves, L.; Mataloto, R.; Jiménez Ávila, J. (2017): Lapa da Cova: un santuario costero en los acantilados de Sesimbra (Portugal). *Mazarrón II - contexto, viabilidad y perspectivas del barco B-2 de la bahía de Mazarrón. En homenaje a Julio Mas García* (Iniasta Sanmartín, A.; Martínez Alcalde, M.; García Cano, J.; Blánquez Pérez, J., coords.) Madrid: 525-545.

- Cardoso, J.L. (1995): O Bronze Final e a Idade do Ferro na região de Lisboa: um ensaio. *Conimbriga*, 34: 33-74.
- Cardoso, J.L. (1999-2000): Aspectos do povoamento da Baixa Estremadura no decurso da Idade do Bronze. *Estudos Arqueológicos de Oeiras*, 8: 355-413.
- Cardoso, J.L. (2004): *A Baixa Estremadura dos finais do IV milénio A. C. até à chegada dos romanos: um ensaio de História Regional*. Estudos Arqueológicos de Oeiras, Oeiras, 12.
- Cardoso, J.L. (2015): Between the Atlantic and the Mediterranean: the Late Bronze Age around the Tagus estuary (Portugal). Economic, social and cultural aspects. *Rivista di Scienze Preistoriche*, LXV: 149-170.
- Carreira, J. R. (1994): A Pré-História Recente do Abrigo Grande das Bocas (Rio Maior). *Trabalhos de Arqueologia da EAM*, 2: 47-144.
- Diloli Fons, J.; Ferré Anguix, R.; Fontanet Fontanet, M. (2021): La panoplia ibérica de guerra recuperada en la torre T3 del poblado protohistórico de l'Assut (Tivenys, Baix Ebre, Tarragona). *Gladius*, 41: 45-65. <https://doi.org/10.3989/gladius.2021.03>
- Echevarría Sánchez, A.; Vera Rodríguez, J. (2015): Los inicios de la viticultura en la Península Ibérica a partir de las huellas de cultivo. *Historia y Arqueología en la cultura del vino* (R. Francia Verde, coord.), Instituto de Estudios Riojanos, Logroño: 57-68.
- Fernández Jurado, J. (1986): Economía tartésica, minería y metalurgia. *Huelva En Su Historia*, Nº 1: 149-170.
- Fernández Jurado, J. (1988-1989): *Tartessos y Huelva*. Huelva Arqueológica, 10/11, Huelva.
- García Sanz, C.; Fernández Jurado, J. (2000): Peñalosa (Escacena del Campo, Huelva). un poblado de cabañas del Bronce Final. *Huelva Arqueológica*, 16: 5-87.
- Grevey, A.; Gailledrat, E. (2020): The origins of the first ferrous knives on the Iberian Peninsula and in Southern France: a typological viewpoint (9th-7th centuries BC). *Iron Metallurgy and the Formation of Complex Societies in the Western Mediterranean (1st Millennium BC) - Proceedings of the 8th International Archaeological Meeting of Calafell* (A. Belarte, M. Rovira, J. Sanmarti, eds.), Universitat de Barcelona, Barcelona: 115-124.
- Gómez Toscano, F. (2008): Cerámicas del Bronce Final en Huelva (1200-600 a.C.). Nueva tipología para explicar su amplitud cronológica. *Tabona*, 16: 85-100.
- Gómez Toscano, F.; Beltrán, J.M.; González, D.; Vera, J.C. (2014): El Bronce Final en Huelva. Una visión preliminar del poblamiento en su ruedo agrícola a partir del registro arqueológico de La Orden-Seminario. *Complutum*, 25(1): 139-158. https://doi.org/10.5209/rev_CMPL.2014.v25.n1.45360
- González de Canales, F.; Llompert Gómez, J. (2020): Problemas de datación de las cerámicas fenicias más antiguas exhumadas hasta la fecha en Huelva. *Entre Utica y Gadir. Navegación y colonización fenicia en el Mediterráneo Occidental a comienzos del I Milenio AC*. (J.L. López Castro, ed.), Editorial Comares, Granada: 229-246.
- Harding, A.; Hughes-Brock, H. (1974): Amber in the Mycenaean world. *The Annual of the British School at Athens*, 69: 145-172.
- Hunt Ortiz, M.A. (2003): *Prehistoric Mining and Metallurgy in South West Iberian Peninsula*. BAR International Series 1188, Archaeopress, Oxford.
- Jambon, A.; Vilaça, R.; Catarino, L.; Barrat, J.-A. (2023): Portuguese irons of the Late Bronze. A geochemical view. *Mediterranean Archaeology and Archaeometry*, 23 (2): 109-125.
- Kalb, P.; Höck, M. (1988): O povoamento pré-histórico de Alpiarça. *Arqueologia*, 17: 193-200.
- Lopez Castro, J. L. (2008): El poblamiento rural fenicio en el sur de la Península Ibérica entre los siglos VI a III a.C. *Gerión*, 1: 149-182.
- Lorrio, A. (2008) - Cuchillos. *La Necrópolis de Medellín II. Estudio de los Hallazgos* (M. Almagro-Gorbea, dir.), Real Academia de Historia, Madrid: 566-571.
- Maia, M. (1986): Neves II e a "fácies" cultural de Neves Corvo. *Arquivo de Beja*, Beja, Série II, 3: 23-42.
- Maia, M.; Maia, M. (1994): Arqueologia da área mineira de Neves-Corvo. *A Idade do Ferro. Catálogo, Câmara Municipal da Figueira da Foz, Figueira da Foz*: 81-115.
- Mancebo, J. (2000): Análisis de los objetos metálicos en el Período Orientalizante y su conexión con el mundo fenicio. Los cuchillos afalcatados. *Actas del IV Congreso Internacional de Estudios Fenicios y Púnicos* (M. Barthélemy, M^a.E. Aubet, coords.), Cádiz, 4: 1825-1834.
- Maran J. (2013): Bright as the sun: The appropriation of amber objects in Mycenaean Greece. *Mobility, Meaning and the Transformations of Things* (H.P. Hahn, H. Weis, eds.), Oxbow, Oxford: 147-169.
- Marzoli, D., Suárez Padilla, J., Torres Ortiz, M., León Martín, C., Renzi, M., Tomassetti Guerra, J. M., Pérez Ramos, L., Torres Abril, F. (2020): Los Castillejos de Alcorrín (Manilva, Málaga): un

- asentamiento fortificado autóctono en el contexto de la primera fase de la presencia fenicia e el entorno del Estrecho de Gibraltar (siglos IX-VIII a.n.e.). *Entre Útica y Gadir. Navegación y colonización fenicia en el Mediterráneo Occidental a comienzos del I Milenio AC*. (J.L. López Castro, ed.), Editorial Comares, Granada: 269-292.
- Mateos Leal, C.; Sánchez Nicolás, D. (2014): El cuchillo afalcatado. Análisis tipológico y funcional de los cuchillos de los yacimientos abulenses durante la II Edad del Hierro. *Investigaciones Arqueológicas en el valle del Duero. Del Paleolítico a la Antigüedad Tardía. Actas de las III Jornadas de Jóvenes Investigadores del Valle del Duero* (F. Fuente, E. Vara, P. Sutil, coords.), Salamanca: 135-150.
- Melo, A. e Senna-Martínez, J. (2000): Agricultores e Metalurgistas da Troca ao “Mercado”: Alguns Aspectos e Problemas do Bronze Final e Primeira Idade do Ferro na Península de Lisboa. *Turres Veteras IV – Actas de Pré-história e História Antiga*, Torres Vedras: 97-118.
- Melo, A.; Valério, P.; Barros, L.; Araújo, M^a.F. (2014): Práticas metalúrgicas na Quinta do Almaraz (Cacilhas, Portugal): vestígios orientalizantes. *Fenícios e Púnicos, Por Terra e Mar. Actas do VI Congresso Internacional de Estudos Fenícios e Púnicos* (A. M. Arruda, ed.), Centro de Arqueologia da Universidade de Lisboa, Lisboa, Vol. 2: 698-711.
- Murillo, J. F. (1994): *La Cultura tartésica en el Guadalquivir Medio*. Ariadna, N^o13-14.
- Murillo-Barroso, M.; Martín-Torres, M. (2012): Amber sources and trade in the Prehistory of the Iberian Peninsula. *European Journal of Archaeology*, 15 (2): 187-216. <https://doi.org/10.1179/1461957112Y.0000000009>
- Murillo-Barroso, M.; Martín-Torres, M.; García Sanjuán, L.; Wheatley, D.; Hunt, M.; Forteza González, M.; Hernández Arnedo, M^a J. (2015): New objects in old structures. The Iron Age hoard of the Palacio III megalithic funerary complex (Almadén de la Plata, Seville, Spain). *Journal of Archaeological Science*, 57: 322-334.
- Murillo-Barroso, M.; Peñalver, E.; Bueno, P.; Barroso, R.; de Balbín, R.; Martín-Torres, M. (2018): Amber in prehistoric Iberia: New data and a review. *PLoS ONE*, 13(8): 202-235. <https://doi.org/10.1371/journal.pone.0202235>.
- Olaio, A. (2023): Entre dois mares e um rio: a margem esquerda da Foz do Tejo (Almada, Portugal) no âmbito das dinâmicas do 1^o milénio a.n.e. na região. *Tarteso - Nuevas fronteras. II Congreso Internacional* (S. Celestino Pérez, Esther Rodríguez eds.), Mérida: 653-671.
- Olaio, A.; Angeja, P.; Monge, R.; Valério, P. (2019): A ocupação da Idade do Ferro de Cacilhas (Almada, Portugal). *Onoba*, 7: 133-159. <http://dx.doi.org/10.33776/onoba.v7i0.3398>
- Ponte, M. (1999): As fíbulas do Bronze Final no Norte e Centro de Portugal: rede de intercâmbios e assimetrias. *Revista Guimarães*, Volume Especial (II): 539-560.
- Ruiz Mata, D. (1989): Huelva: un foco temprano de actividad metalúrgica durante el Bronce Final. *Tartessos: Arqueología protohistórica del Bajo Guadalquivir* (M^a.E. Aubet, coord.), AUSA, Sabadell: 209-243.
- Ruiz Mata, D. (1995): Las cerámicas del Bronce Final. Un soporte tipológico para delimitar el tiempo y el espacio tartésico. *Tartessos 25 años después (1968-1993)*, Jerez de la Frontera: 265-313.
- Ruiz Mata, D.; Fernández Jurado, J. (1986): *El yacimiento metalúrgico de época tartésica de San Bartolomé de Almonte (Huelva)*. Huelva Arqueológica, 8.
- Sabatini, S.; Melheim, I. (2017): Nordic-Mediterranean relations in the Second Millennium BC. *New Perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium* (S. Bergerbrant, A. Wessman, eds.), Archaeopress, Oxford: 355-362.
- Sánchez Moreno, V.-M.; San José, L.; Navarro, M. (2020): El santuario fenicio de La Rebanadilla. *Entre Útica y Gadir. Navegación y colonización fenicia en el Mediterráneo Occidental a comienzos del I Milenio AC*. (J.L. López Castro, ed.), Editorial Comares, Granada: 189-200.
- Soares, A. M.; Arruda, A. M. (2017): A cronologia de radiocarbono para a Idade do Ferro Orientalizante no território português. Uma leitura crítica dos dados arqueométricos e arqueológicos. *IberCrono 2016 - Cronometrías Para la Historia de la Península Ibérica- Actas del Congreso*. (Barcleó, J. A.; Bogdanovic, I.; Morell, B., eds.), Barcelona: 235-259.
- Sousa, E. (2016): Algumas considerações sobre a ocupação do Final da Idade do Bronze na Península de Lisboa. *Terra e Água. Escolher sementes, invocar a Deusa – Estudos em Homagem a Victor S. Gonçalves* (A. Sousa., A. Carvalho, C. Viegas, eds.), Centro de Arqueologia da Universidade de Lisboa, Lisboa: 387-401.
- Sousa, E. (2021): A cerâmica cinzenta do estuário do Tejo durante a Idade do Ferro: algumas precisões sobre a sua cronologia, tipologia, produção e consumo. *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid*, 47(1): 27-167.

- Sousa, A.; Pereira, C.; Miranda, M.; Soares, A. M.; Odriozola, C.; Arruda, A. M. (2022): Cabecinho da Capitôa (Mafra, Lisbon, Portugal). An amber necklace and ceramic vessels in votive contexts of the Western Iberia Late Bronze Age/Early Iron Age. *Madridrer Mitteilungen*, 63: 42-75.
- Tews, T. (2016): Os vasos perfurados sem fundo nas primeiras sociedades agro-pastoris na Península Ibérica e na Europa Central: perspectivas da arqueologia (experimental), arqueometria e etnografia. *Entre ciência e cultura: da interdisciplinaridade à transversalidade da arqueologia. Actas das VIII Jornadas de Jovens em Investigação Arqueológica* (I.P. Coelho, J. Torres, L. Gil, T. Ramos, coords.), Lisboa: 135-146.
- Valério, P. (2012): *Archaeometallurgical Study of Pre and Protohistoric Production Remains and Artefacts from Southern Portugal*. Dissertação de doutoramento apresentada à Faculdade de Ciências e Tecnologia da Universidade NOVA de Lisboa. Policopiada.
- Valério, P.; Melo, A.; Barros, L.; Araújo, M^a.F. (2003): Archaeometallurgical Studies of Prehistorical Artefacts from Quinta do Almaraz (Cacilhas, Portugal). *Proceedings of the International Conference Archaeometallurgy in Europe*, Associazione Italiana di Metallurgia, Milão, Vol. 1: 327-336.
- Vallejo Sánchez, J.I. (2015) – *Las cerâmicas grises orientalizantes en la Península Ibérica*. Tesis de Doctorado, Universidad de Cádiz. Edição Policopiada.
- Vera Rodríguez, J.; Echevarría Sánchez, A. (2013): Sistemas agrícolas del I milénio a.n.e. en el yacimiento de La Orden-Seminario de Huelva. Viticultura protohistorica a partir del análisis arqueológico de las huellas de cultivo. *Patrimonio Cultural de la vid y el vino* (S. Celestino, J. Blánquez Pérez, eds), Mérida: 95-106.
- Vilaça, R. (1995): *Aspectos do Povoamento da Beira Interior (Centro e Sul) nos Finais da Idade do Bronze*. Trabalhos de Arqueologia, 9. Lisboa.
- Vilaça, R. (2006): Artefactos de ferro em contextos do Bronze Final do território português: novos contributos e reavaliação dos dados. *Complutum*, 17: 81-101.
- Vilaça, R. (2007): Todos os caminhos vão dar ao Ocidente: trocas e contactos no Bronze Final. *Estudos Arqueológicos de Oeiras*, 15: 135-154.
- Vilaça, R. (2008-2009): Sobre tranchets do Bronze Final do Ocidente Peninsular. *Portugália*, XX-IX-XXX: 61-84.
- Vilaça, R. (2013): Contextes d'utilisation, de circulation et de déposition des premiers artefacts en fer de l'Atlantique occidentale. *L'Âge du Fer en Aquitaine et sur ses marges. Mobilité des hommes, diffusion des idées, circulation des biens dans l'espace européen à l'Age du Fer, Actes du 35e Colloque Internationale* (A. Colin, F. Verdin, eds.), Bordeaux: 631-642.
- Vilaça, R.; Arruda, A. (2004): Ao longo do Tejo, do Bronze ao Ferro. *Conímbriga*, XLIII: 11-45.
- Vilaça, R.; Beck, C.W.; Stout, E. C. (2002): Provenience analysis of prehistoric amber artifacts in Portugal. *Madridrer Mitteilungen*, 43: 61-78.
- Vilaça, R.; Cardoso, J. L. (2017): O Tejo português durante o Bronze Final. *Territorios comparados: los valles del Guadalquivir, el Guadiana y el Tajo en época Tartésica* (S. Celestino Pérez, Esther Rodríguez eds.), Mérida: 237-282.