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CERAMIC ASSEMBLAGES FROM A FISH-SALTING FACTORY IN TRÓIA (PORTUGAL)

Introduction

Located on a peninsula in the south-western coast of Portugal (**fig. 1**), the Roman ruins of Tróia are the remains of a large complex of fish-salting factories located in a low area of sand dunes on the border of the river Sado's estuary. In Roman times it may have been an island facing the ocean, probably the *Achale* island mentioned by Avienus in the *Ora Maritima*¹, in the Roman province of *Lusitania*. The production complex of Tróia may be considered one of the largest fish-salting production centres in the Western Roman Empire² with at least twenty units of production formed by tanks situated around a patio. These units of production are called workshops (*oficinas* in Portuguese) to distinguish them from *factories* that would include several workshops and other installations like storerooms³.

A fish-salting production unit in Tróia: Workshop 2

Workshop 2 was partially uncovered during previous (unpublished) excavations which took place in the late fifties or early sixties of the twentieth century. In these previous excavations, eleven tanks, some of them subdivided into smaller ones, were found situated around a patio, in three rows touching at right angles (**fig. 2**). Very recent excavations carried out in 2008 uncovered the fourth side, showing that the rectangular room, measuring 16,2 m by 21,2 m had a total of 19 tanks along its four walls.

The first study and interpretation of the factory to which Workshop 2 belongs was completed in 1994⁴ and revealed a period of abandonment at the end of the 2nd century AD and a reactivation sometime in the 3rd century. The final abandonment would have occurred in the middle of the 5th century.

Stratigraphic contexts relevant for the understanding of Workshop 2

The preparation of Workshop 2 for future presentation to the public implied the cleaning and excavation of some of its fish-salting tanks in 2007 and 2008. Three tanks which had not been previously excavated, tanks 7c, 8 and 9 (**figs. 2 and 3**), presented valuable contexts for the phasing and dating of that workshop.



Fig. 1. Location of Tróia in the Iberian Peninsula.

The excavation revealed that tanks 7c and 8 went out of use, at some point, for fish-salting production and were covered over with a coarse *opus signinum* pavement still visible around them. While tank 8 kept that pavement until the abandonment of the workshop, the pavement was removed from tank 7c, and so was the fill that lay under the pavement, the tank being finally filled by a late garbage dump.

The room which had been built over tanks 7c and 8 was wider than the tanks on the north-west side: it covered the original wall between tanks 8 and 9 and a new wall was built on the north-east side of tank 9 after the tank was filled in. This means that this tank went out of use for fish-salting activity at the same time as tank 8, and then the area of the filled tank became a passage leading out of the workshop to the north-east.

¹ J. ALARCÃO, Notas de arqueologia, epigrafia e toponímia I. Rev. Portuguesa Arqu. 7/1, 2004, 317–342.

² ÉTIENNE/MAKAROUN/MAYET 1994, 118.

³ T. SILVEIRA/F. ANDRADE/I. V. PINTO/A. P. MAGALHÃES/V. CABEDAL, Enchimento de praia para protecção das ruínas romanas de Tróia: projecto e acompanhamento arqueológico. In: II Encontro de Arqueologia da Arrábida. Homenagem a I. Marques da Costa (17 de Novembro de 2007). Setúbal Arqu. 14 (in press).

⁴ ÉTIENNE/MAKAROUN/MAYET 1994.

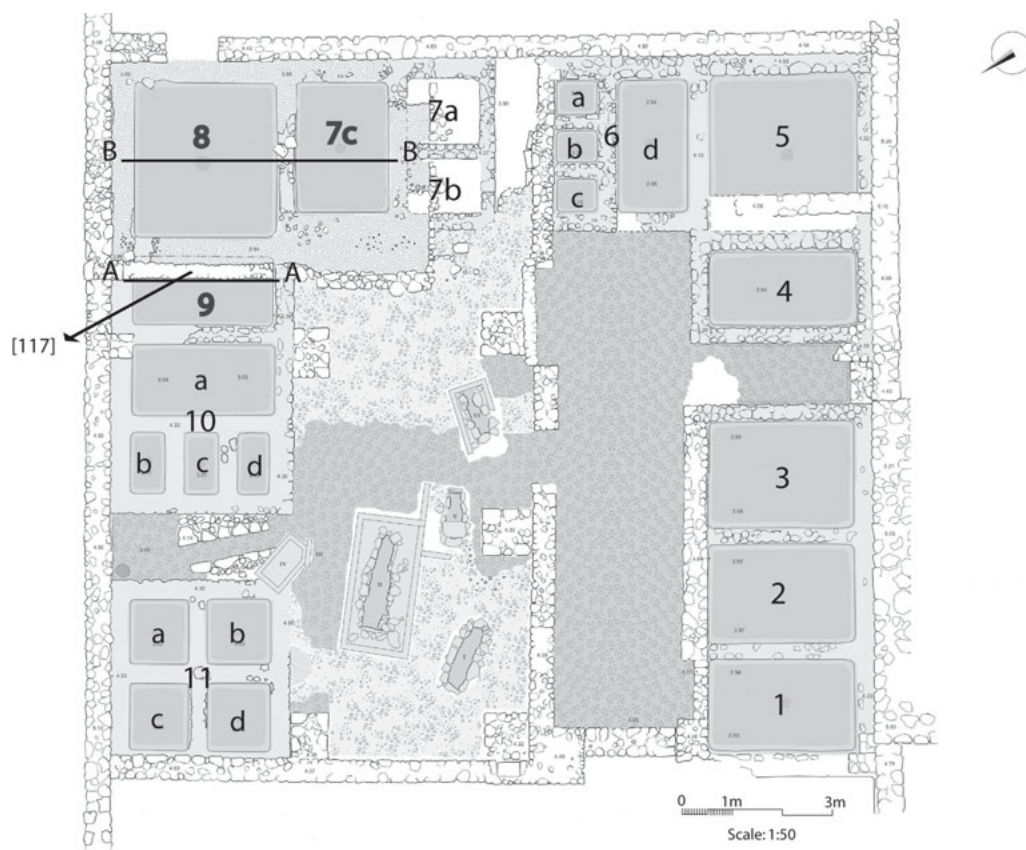


Fig. 2. Plan of Workshop 2 before the 2008 excavations (Y. Makaroun 1994 and J. L. Madeira 2008).

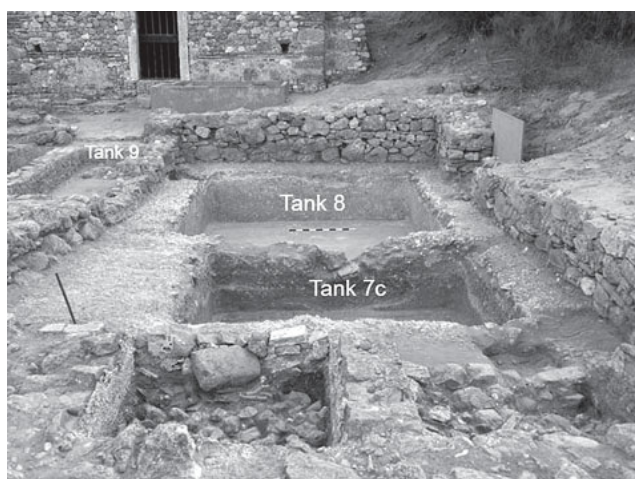


Fig. 3. View of tanks 7 and 8 after excavation and tank 9 with its fill.

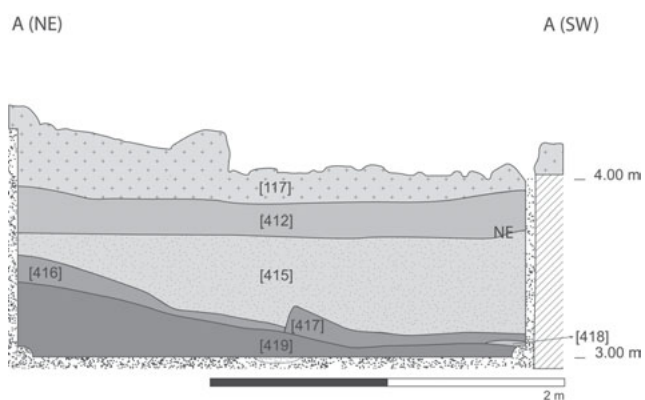


Fig. 4. Section A–A of tank 9.

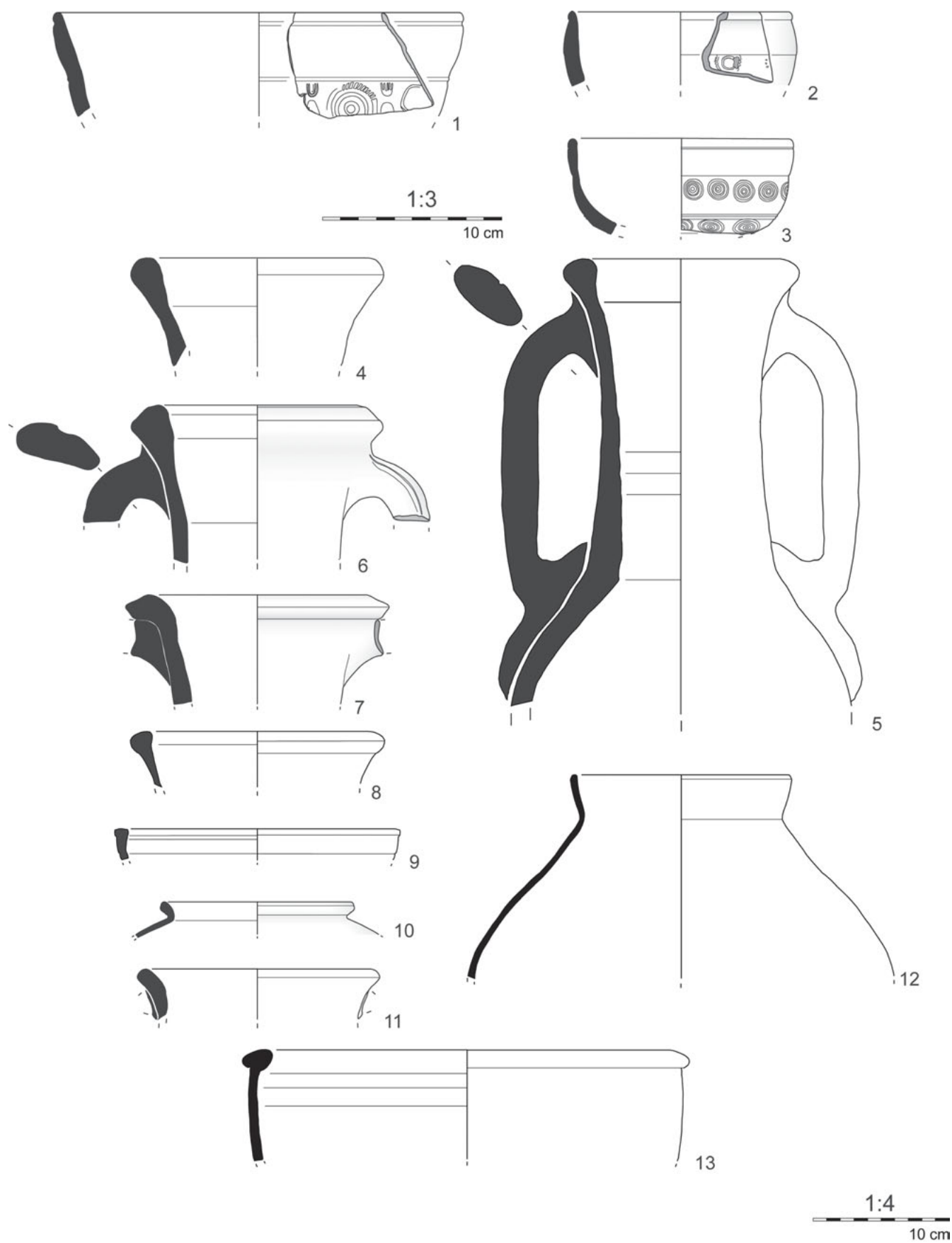


Fig. 5. Ceramics from stratigraphic units [417] - [419] in tank 9.

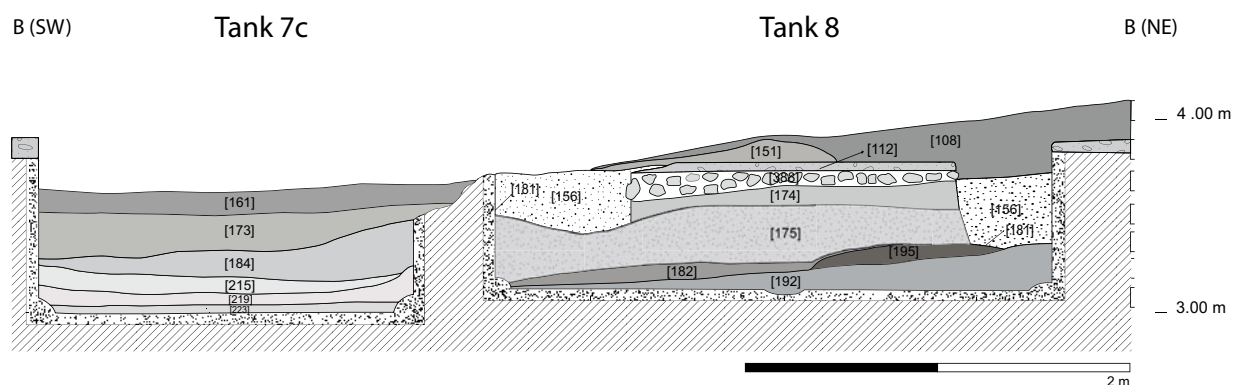


Fig. 6. Section B-B of tank 7c and tank 8.

Therefore, the fills of tanks 8 and 9 should date the filling of these tanks prior to the remodelling of the building, while tank 7c offers a garbage deposit contemporary with the abandonment of the workshop.

Tank 9 (figs. 4–5)

The excavation of tank 9 only covered the area north-west of the late wall [117] (figs. 2 and 4) which reduced its area after the tank was filled. This wall was already exposed down to its base.

Under the wall, the first stratigraphic unit [412], which had been exposed for several decades, was a greyish-brown clayey layer. It did not contain many finds and they were of disparate types and periods: for example, Hispanic sigillata with African Red Slip types A and C. Under this layer there was a sand fill [415] very similar to the sand fill [175] of tank 8 (fig. 6), but sterile. This fill sealed four units with different characteristics but contemporary finds. Unit [416] was a clay deposit in the northern part of the tank with a few body fragments of Baetican and regional amphorae and common wares. It covered units [417] and [419].

Unit [417], much thicker on the north-west side of the tank (not seen in the section of fig. 4), was a debris layer with many fragments of ceramics mixed with large fallen pieces of the north-west wall mortar revetment. This suggests that before the tank was filled with sand there was a period of abandonment long enough for the revetment of the walls to start falling down. The ceramics in this unit were mostly pieces of regional amphora Dressel 14, some common ware and only fragments of two Hispanic sigillata cups, one of them belonging to the same cup as that found in unit [182] of Tank 8 (fig. 7,1). This means that the dumps in the two neighbouring tanks were contemporary and resulted from the same process.

Unit [419] was a layer of greenish-brown clayey sediment similar to unit [192] in tank 8 and also yielded a quantity of fragments of Dressel 14 amphorae, some common ware and a few Hispanic sigillata bowls. Unit [418] was just a group of Dressel 14 amphora fragments set apart because it had a concentration of sediment full of small fish bones adhering to the amphora fragments, apparently the contents

of that amphora rather than the remains from the tank's production.

It is the material from the units [416]–[419], sealed by the sand layer, which represent the abandonment of the tank at the end of the first phase of activity. Fig. 5 illustrates examples of the most significant ceramics found in these units.

Six pieces of Hispanic sigillata were recovered, one from Tricio (a fragment of a Drag. 27 cup) and five from Andújar: one Drag. 37A (fig. 5,1), two small bowls Drag. 37A/Aj 1⁵ (fig. 5,2–3) decorated with concentric circles, an unclassifiable base and a Drag. 27 which matched with cup 1 (fig. 7, 1) found in the neighbouring tank 8, indicating that the two fills were contemporaneous. The production of these pieces of Hispanic sigillata may be dated from the second half of the 1st century to the end of the 2nd century.

The most abundant amphora is the Dressel 14 (fig. 5,4–6), with regional orange fabrics typical of the pottery workshops of the lower river Sado (and lower river Tejo)⁶, and represented by a total of 14 individuals based on the number of different rims. Most of them have a rounded lip which corresponds to the variant c of that form, typical of the 2nd century⁷, while others belong to an earlier variant (b). The Baetican fish-products amphora Beltrán IIB, dated from the second half of the 1st century and the 2nd century⁸, is represented by one individual (fig. 5,7). The most important piece in terms of dating is a regional Late Dressel 14 (*Dressel 14 tardia*) (fig. 5,8), identified in the pottery workshops of Abul and Pinheiro in the lower Sado, and not produced before the end of the 2nd century, being common in the first half of the 3rd⁹.

Common ware is not abundant since only eight rims and four bases were identified. The most significant are a terrine (fig. 5,9), an olla (fig. 5,10) of a common form in the Roman villae at São Cucufate (VIII-B-2)¹⁰, another one not so typical (fig. 5,11), an unusual thin-walled pot (fig. 5,12) and two very common basins (fig. 5,13) (from São Cucufate V-

⁵ SOTOMAYOR/ROCA ROUMENS/FERNÁNDEZ GARCÍA 1999, 27.

⁶ F. MAYET/A. SCHMITT/C.T. SILVA, *Les amphores du Sado* (Paris 1996).

⁷ MAYET/SILVA 2002, 105.

⁸ ETIENNE/MAYET 2002, 129–130.

⁹ MAYET/SILVA 2002, 171–173; F. MAYET/C. T. SILVA, *L'atelier d'amphores de Pinheiro* (Portugal) (Paris 1998) 114–120.

¹⁰ PINTO 2003, 346–350.

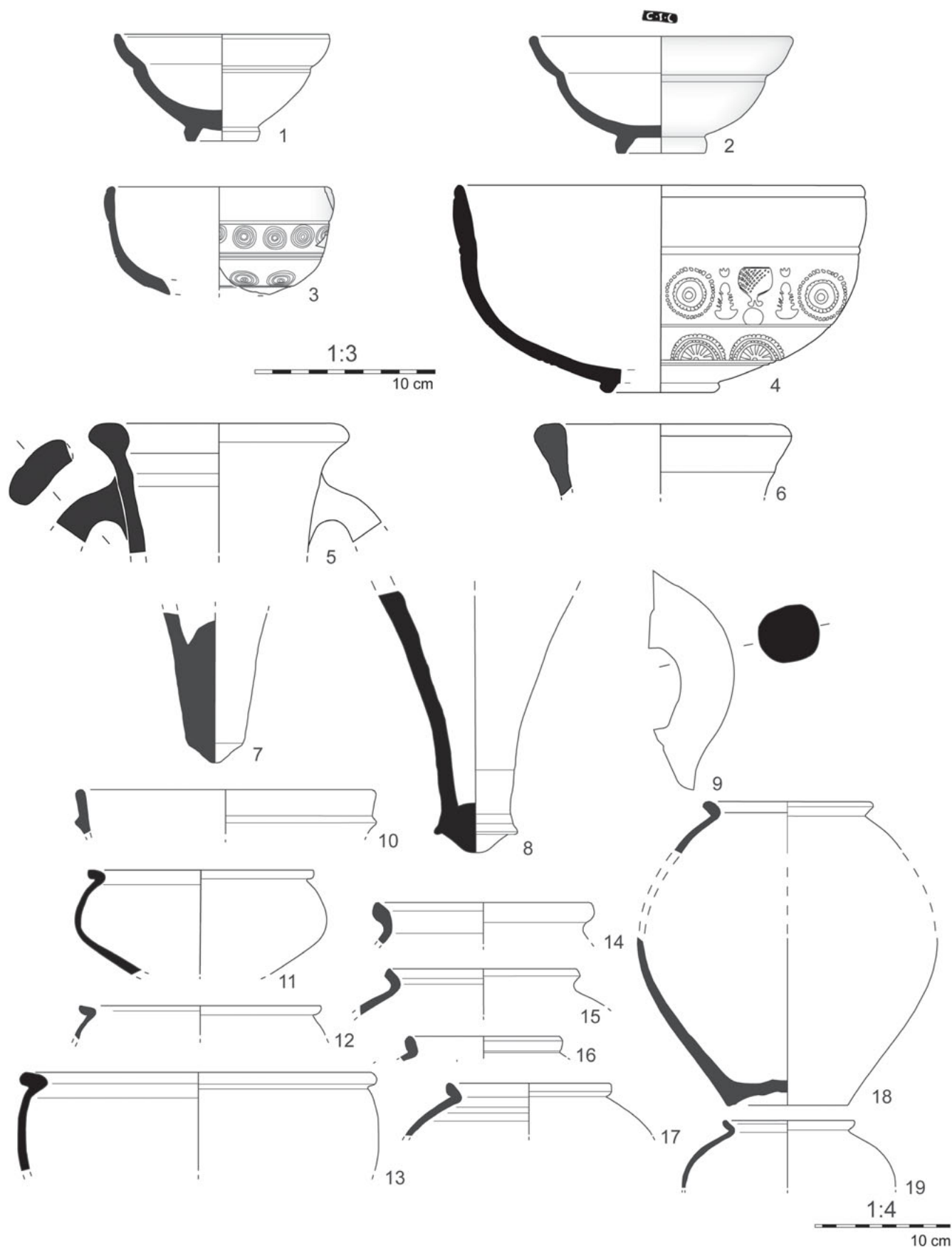


Fig. 7. Ceramics from stratigraphic units [182], [192] and [195] in tank 8.

A-1¹¹). None of these seems to have a restricted chronology. There was also the neck and rim of a glass bottle of Isings form 50b, dated mainly from the Flavian period to the end of the 2nd century¹².

Tank 8 (figs. 6–7)

The excavation of tank 8 first revealed two layers of sediment ([108] and [151], **fig. 6**) that were deposited by old excavations. These were deposited on a pavement made of coarse *opus signinum* [112] which had been cut along the walls forming a trench [181]. The fill [156] of this trench was composed of loose brownish soil with construction debris and a mix of materials of different periods, for example Hispanic sigillata and African Red Slip type A and C, amphorae Dressel 14 and Almagro 50. These units were interpreted as a trench dug by previous archaeologists to expose the walls of tank 8 and then refilled.

The pavement floor [112] had two preparation layers, the first made of clay [174] and the other of pebbles assembled with clay [388]. The pavement and its foundation had been laid on top of a sand layer [175] very similar to the sand fill [415] in tank 9, but this one containing few finds, none of them later than the 2nd century.

The sand layer [175] covered three stratigraphic units which contained fragments of the same ceramic pieces, showing they were contemporary. Unit [182] was a layer of ceramic fragments; unit [195] was a small deposit of yellowish-brown clay and [192] was a greenish-brown sediment layer lying on the pavement of the tank, very similar to unit [419] in tank 9. These three units were interpreted as garbage dumps which accumulated after the last period of fish-production activity of the tank and before its deliberate filling to turn it into a room. As was mentioned above, a missing piece of the sigillata cup, **fig. 7, 1**, was found in Tank 9, showing that the garbage dumps in the two neighbouring tanks were contemporary and resulted from the same process.

The garbage deposited under the sand layer revealed four classifiable items of Hispanic sigillata, all from Andújar, of the forms Drag. 27 (**fig. 7,1–2**), one of them (2) stamped C.I.C., Drag. 37/Aj.1 (**fig. 7,3**) and Drag. 37A (**fig. 7,4**). These pieces may be dated from the second half of the 1st century to the end of the 2nd century; the stamp recovered is attested in the Andújar sigillata productions with the formula EX OF and is dated to the Flavian period¹³.

The predominant amphora is again the regional Dressel 14 (**fig. 7,5–8**), with many fragments but only seven individuals according to the number of different rims. One complete handle and a few body fragments indicate the presence of the Baetican oil amphora Dressel 20 (**fig. 7,9**) and some body fragments belong to unclassifiable Baetican garum amphorae.

Common ware is represented by 23 classifiable individuals, all of regional fabric. There is a possible terrine (**fig. 7,10**), three *caccabi* (**fig. 7,11–13**), eight *ollae* (**fig. 7,14–18**), one pot (not illustrated), three small pots (**fig. 7,19**), three basins similar to **fig. 5, 13** from tank 9 and four lids (not illustrated). These are common forms in the 1st and 2nd centuries in Lusitania, similar to vessels found in the men-

tioned workshops of the low Sado but also in the *villae* at São Cucufate, also in the South of Portugal, but inland.

Tank 7c (figs. 6,8–9)

Tank 7c had been partially excavated and its two top layers ([161] and [173]) were deposits from previous excavations. Unit [184] was a debris layer with large boulders, bricks and a few tiles apparently deriving from the destruction of the south-east wall.

Under this debris layer three different stratigraphic units were identified. Unit [215] was a layer of fine and loose greyish-brown sand with much pottery and many headless fish bones, some of them belonging to large fish. African Red Slip ware types A and D, Almagro 51a–b and Keay LXXVIII/Sado 1 amphorae were found in this debris.

Unit [219] was a whitish sandy layer which also had pottery and fish bones. It contained African Red Slip types C and D and amphorae Almagro 51c, Keay LXXVIII/Sado 1 and Almagro 51a–b.

Unit [223] was a greyish sandy deposit with abundant charcoal and a large quantity of finds, in particular many amphorae and common wares. African Red Slip ware types C and D were present and so were amphorae Almagro 51c, Keay LXXVIII/Sado 1, Almagro 51a–b, and also unclassifiable fragments of Baetican and African amphorae.

Even though there were differences in the sediment of the three units, they yielded the same kind of objects and several items had pieces in different units. The jug **fig. 9,27**, for example, had pieces in all these units.

The finds from these three units were considered dump material thrown into the empty tank and thus dating its final abandonment. The best indicators for the dating of these units are the African Red Slip pieces, a Hayes 73A in type C (**fig. 8,1**), a Hayes 80A (**fig. 8,3**) and a Hayes 91 variant A or B, in type D (**fig. 8,2**). The Hayes 73A is dated by Hayes between 420 and 475¹⁴ but in the *Atlante* there are references of its presence in contexts of the beginning of the 5th century¹⁵. The bowl Hayes 80A is dated by Bonifay to the middle of the 5th century¹⁶. The bowl Hayes 91 could belong to the beginning of the second half of the 5th century if it is a variant B, but that is not certain, and it may be a variant A which is dated by the same author to the first half of the 5th century¹⁷. All taken into account, the African Red Slip pieces point to a deposit in the middle of the 5th century.

The regional fish-products amphora Almagro 51c, usually the most common in late Lusitanian contexts, is here represented by one rim and five bases which represent five individuals. One is variant b (**fig. 8,9**) but has a fine orange fabric atypical in the regional productions, three are variant

¹¹ Ibid. 281–288.

¹² C. ISINGS, Roman glass from dated finds (Groningen, Djakarta 1957) 66–67.

¹³ MAYET 1984, 43; SOTOMAYOR/ROCA ROUMENS/FERNÁNDEZ GARCÍA 1999, 40.

¹⁴ J. W. HAYES, Late Roman pottery (London 1972) 124.

¹⁵ *Atlante I*, EAA *Atlante delle forme ceramiche I. Ceramica fine romana nel bacino mediterraneo (medio e tardo impero)* (Roma 1981) 104.

¹⁶ BONIFAY 2004, 173.

¹⁷ Ibid. 179.

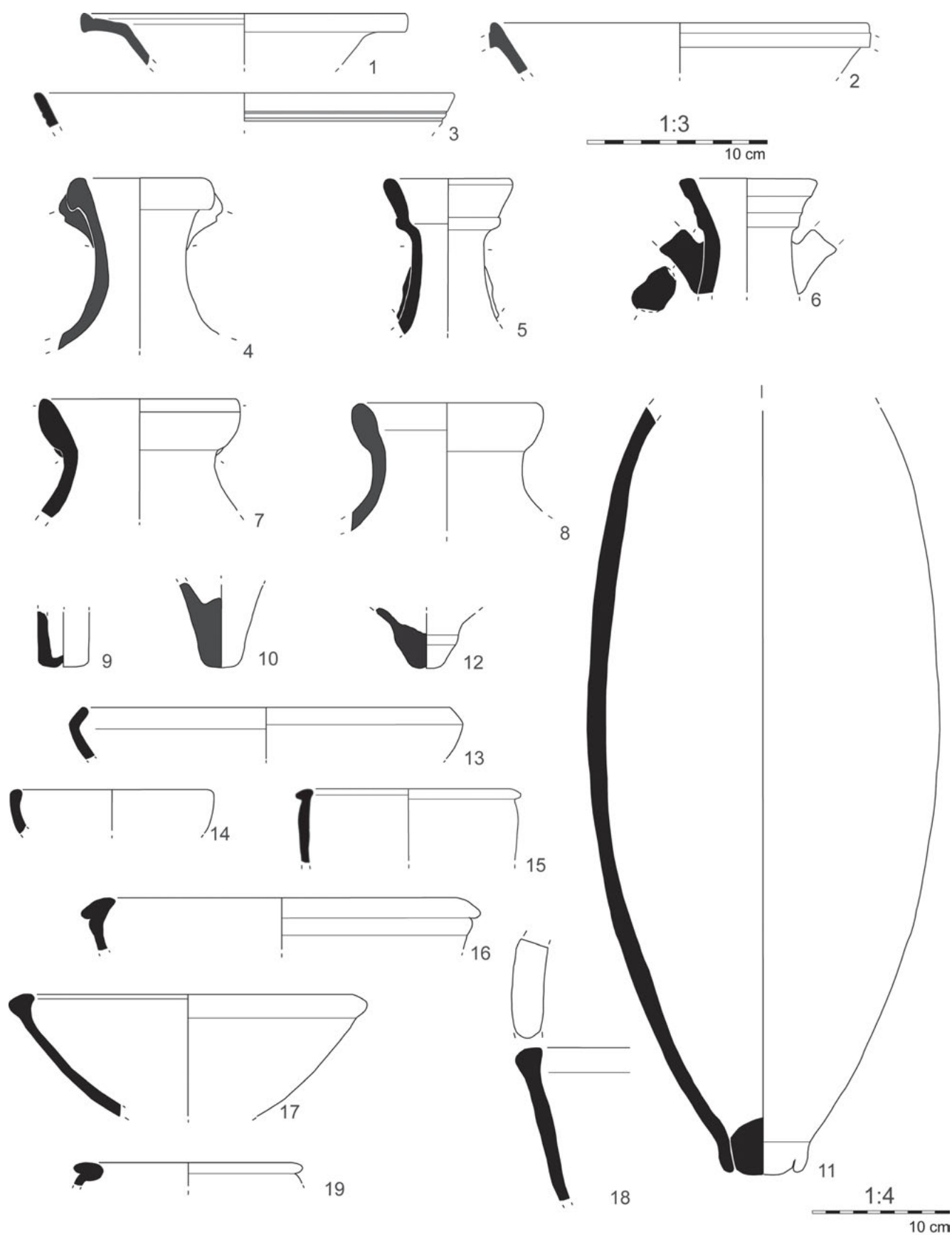


Fig. 8. Ceramics from stratigraphic units [215], [219] and [223] in tank 7c.

c (fig. 8,10) but only two have a typical regional fabric, and the last one is an almost complete body with a low and wide base (fig. 8,11) comparable to the amphora Lusitana 10¹⁸ and to the Almagro 51c found in Rua dos Correeiros (Lisboa)¹⁹, even if our piece, definitely regional, has an atypical ball of clay closing the base. The Almagro 51c variant b has a chronology from the middle of the 3rd century to the middle of the 4th century while the variant c, predominant in this dump, seems to have been produced from the middle of the 4th century to the middle of the 5th²⁰. The Almagro 51c with a low and wide base like n° 11 must be a late version of this amphora since it was not produced in the workshop of Pinheiro but appears in other abandonment contexts in Tróia (unpublished).

The Almagro 51a–b, another fish-products amphora, is equally represented by five individuals (five different rims, five handles and two bases), most of them with a typical regional fabric. Both the plain rim variant A (fig. 8,5) and the moulded rim variant B (fig. 8,6) are present. According to R. Etienne and F. Mayet, this amphora is not produced in Lusitania before the end of the 4th century, and it lasts until the middle of the 5th century.²¹

The most abundant amphora in this dump is the Keay LXXVIII/Sado 1, a regional amphora also for fish products, represented by seven different rims, all almond-shaped (fig. 8,7–8). Its production at the workshop of Pinheiro does not go beyond the middle of the 4th century²², but that chronology is far too low for the pieces present in this dump.

According to its orange fabric with a whitish surface, the base fig. 8,12 belongs to an African amphora of uncertain typology.

There were 30 classifiable rims of common ware: three *patellae* (fig. 8,13) of the form São Cucufate II-B-3 datable to the 5th century²³; one bowl (fig. 8,14); seven basins (fig. 8,15–18), some of them of oval shape (18); one *caccabus* (fig. 8,19); seven cooking pots (fig. 9,20–25), some of them of long duration forms (20–23) and the others apparently not earlier than the middle of the 5th century (24–25); one pot (fig. 9,26); one complete jug (fig. 9,27) and three other jug rims (fig. 9,28–29); one pitcher (fig. 9,30); three *dolia* of common forms (fig. 9,31–33) and a *dolium* lid (not illustrated).

Conclusions

The materials present in the dumps in tanks 8 and 9 represent the final abandonment of those structures as fish-processing tanks and indicate that their abandonment is not earlier than the end of the 2nd century/beginning of the 3rd, thanks to the presence of an amphora Late Dressel 14. Yet,

other elements like the absence of Gaulish sigillata and the predominance of the amphora Dressel 14 variant c indicate a date in the 2nd century. The relative abundance of Hispanic sigillata from Andújar in levels from the end of the 2nd century suggests that this production centre is still exporting its products in the late 2nd century. The presence of the small hemispherical bowl (Aj.1) which has been related to the first production phase of Andújar²⁴ is also surprising, and its decorative pattern and its association with much coarser fabric pieces from this deposits suggests that it could also belong to the second or even the third phase of this production centre²⁵.

The ceramic assemblage deposited in the empty tank 7c indicates a final abandonment of this structure in the middle of the 5th century according to the African Red Slip present in that dump. With regard to the amphorae, the association and relative abundance of three types, the Almagro 51c, the Almagro 51a-b and the Keay LXXVIII/Sado 1 is particularly interesting, suggesting a contemporary production and use of the three, probably related to a diversification of the products being made in the factory in its final period of activity.

The study of these ceramic assemblages is a contribution to define and confirm the chronology of the end of the first and second phases of production in the fish-salting Workshop 2 in Tróia. The dating of the end of the first period of activity to the end of the 2nd century/beginning of the 3rd also provides a *terminus post quem* for the remodelling of this workshop, showing that its second phase of activity did not start before the 3rd century.

¹⁸ A. D. DIOGO, Quadro tipológico das ânforas de fabrico lusitano. In: O Arqueólogo Português 4,5 (Lisboa 1987) 179–191.

¹⁹ J. RAPOSO/C. FABIÃO/A. GUERRA/J. BUGALHÃO/A. L. DUARTE/A. SABROSA/M. I. DIAS/M. I. PRUDÊNCIO/M. A. GOUVEIA, OREST Project: late Roman pottery productions from the lower Tejo. In: LRCW1 Late Roman coarse wares, cooking wares and amphorae in the Mediterranean. BAR Internat. Ser. 1340 (Oxford 2005) 51 fig. 22.

²⁰ ETIENNE/MAYET 2002, 145–147.

²¹ Ibid. 148–149.

²² Ibid. 151.

²³ PINTO 2003, 215–220; C. AMARO J. BUGALHÃO/A. SABROSA, Complexo fabril romano na Rua Augusta. Notícia preliminar. In: Ocupação Romana dos Estuários do Tejo e do Sado. Actas das Primeiras Jornadas sobre romanização dos estuários do Tejo e do Sado (Lisboa 1996) 199–214 fig. 1,1.

²⁴ MAYET 1984, 50; SOTOMAYOR/ROCA ROUMENS/FERNÁNDEZ GARCÍA 1999, 27.

²⁵ Ibid. 31–33.

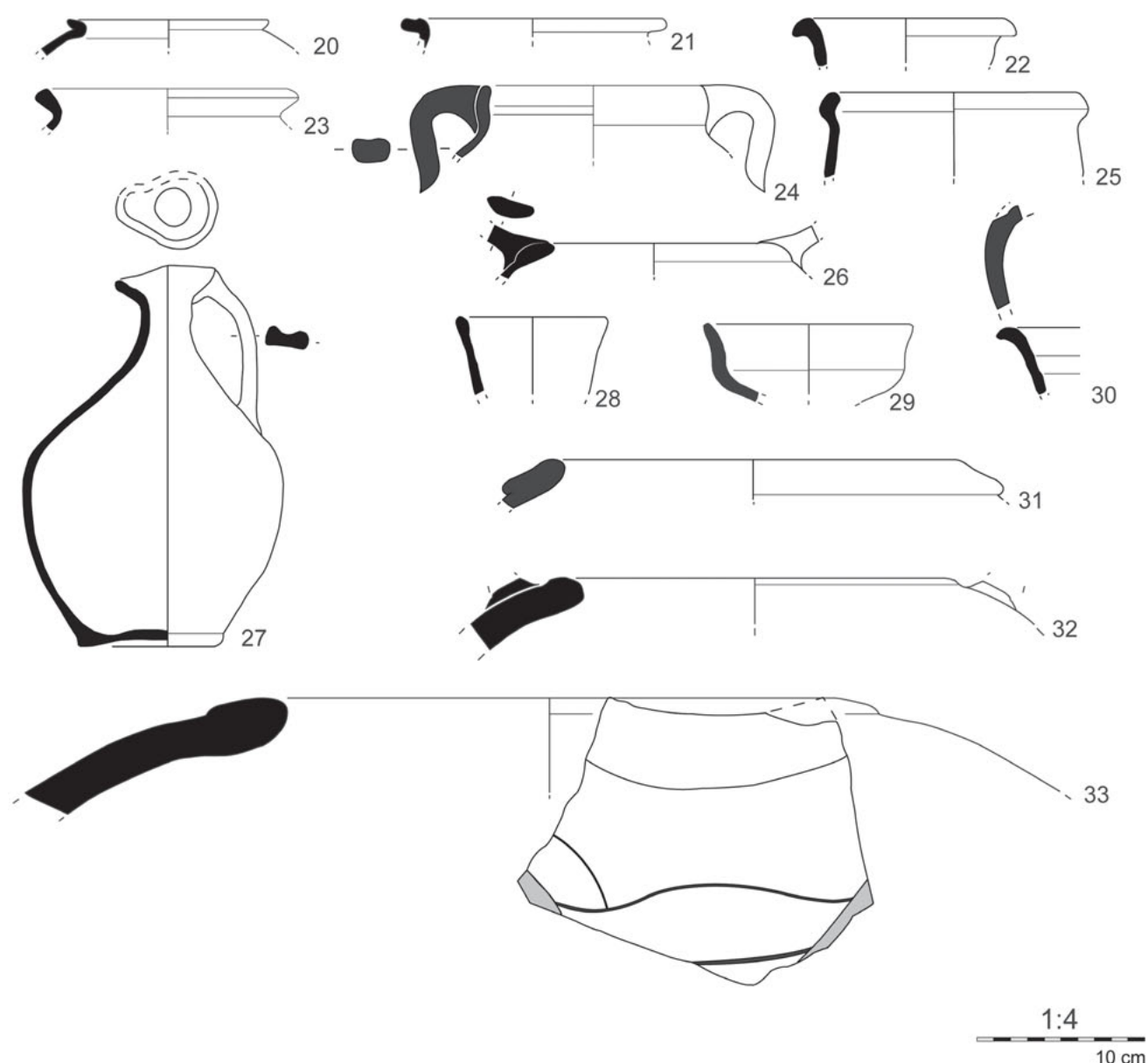


Fig. 9. Ceramics from stratigraphic units [215], [219] and [223] in tank 7c.

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