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CERAMIC EVIDENCE IN THE FISH-SALTING WORKSHOP 23 AT TROIA (PORTUGAL): AMPHORAE AND PITCHERS

In 2016, a rescue excavation took place in the Workshop 23 in the large fish-salting production centre of Troia, on the shoreline of the Sado River estuary, that is suffering a severe erosion process mainly caused by tidal currents. The archaeological campaign exposed the contexts of three vats, two of them still preserving fish remains from the last production. One is the first in Troia to reveal a predominance of mackerel. The ceramic evidence attending Vat 9, with its preponderance of the Dressel 14, Variant C amphora in association with pitchers, revealed 'industrial' refuse of the second half of the 2nd century. This find brings additional evidence for the end of the first phase of production in Tróia, reflecting the weight of the regional pottery production, along with some imports from other provinces due to trade contacts.

Troia – Lusitanian amphorae – Dressel 14 amphora – fish-salting production – pitchers

1. Introduction

Roman Troia is located on the southwestern coast of Portugal, on the present peninsula of Troia, a sand embankment between the estuary of the Sado River and the Atlantic Ocean that in Roman times was probably the island of *Achale* referred by *Avienus* (Ferreira 1992: 22; Alarcão 2011: 324-325) (**fig. 1**).

Located in the province of Lusitania, in the *municipium* of *Salacia Imperatoria Urbs*, Troia was an important urban-industrial agglomerate, the largest fish-salting production centre known in the Roman imperial period. According to the archaeological evidence, it was first built in the Tiberian period and active until the second quarter of the 5th century, with vestiges of continued occupation until the 6th or even the early 7th centuries.

In its long period of activity, three phases have been distinguished: the first one corresponding to the 1st and 2nd centuries, the second one running from the 3rd century to the early 4th century and a third one from the early 4th century to the second quarter of the 5th century (Pinto, Magalhães and Brum 2014; 2018).

2. A fish-salting production unit in Troia: Workshop 23

Presently located on the shoreline along the Sado River estuary (**fig. 2**), in an area I. Marques da Costa (1923/1924: fig. 1) called 'Cova do Verde', Workshop 23 would be part of his '*1º Grupo de Cetareas*' (first group of fish-salting vats). In the publication of the industrial complex of Tróia, R. Étienne, Y. Makaroun and F. Mayet (1994: 99 and fig. 49, n. 11) referred and briefly described this Workshop as 'Ensemble 10.'



Fig. 1. Location of Troia within the fish-salting factories of Lusitania.

The Workshop has been subject to a very dynamic process of coast erosion mainly caused by a rise in the sea-level and by tidal currents that wash away the sand sediment, exposing



Fig. 2. Aerial photograph of Workshop 23.

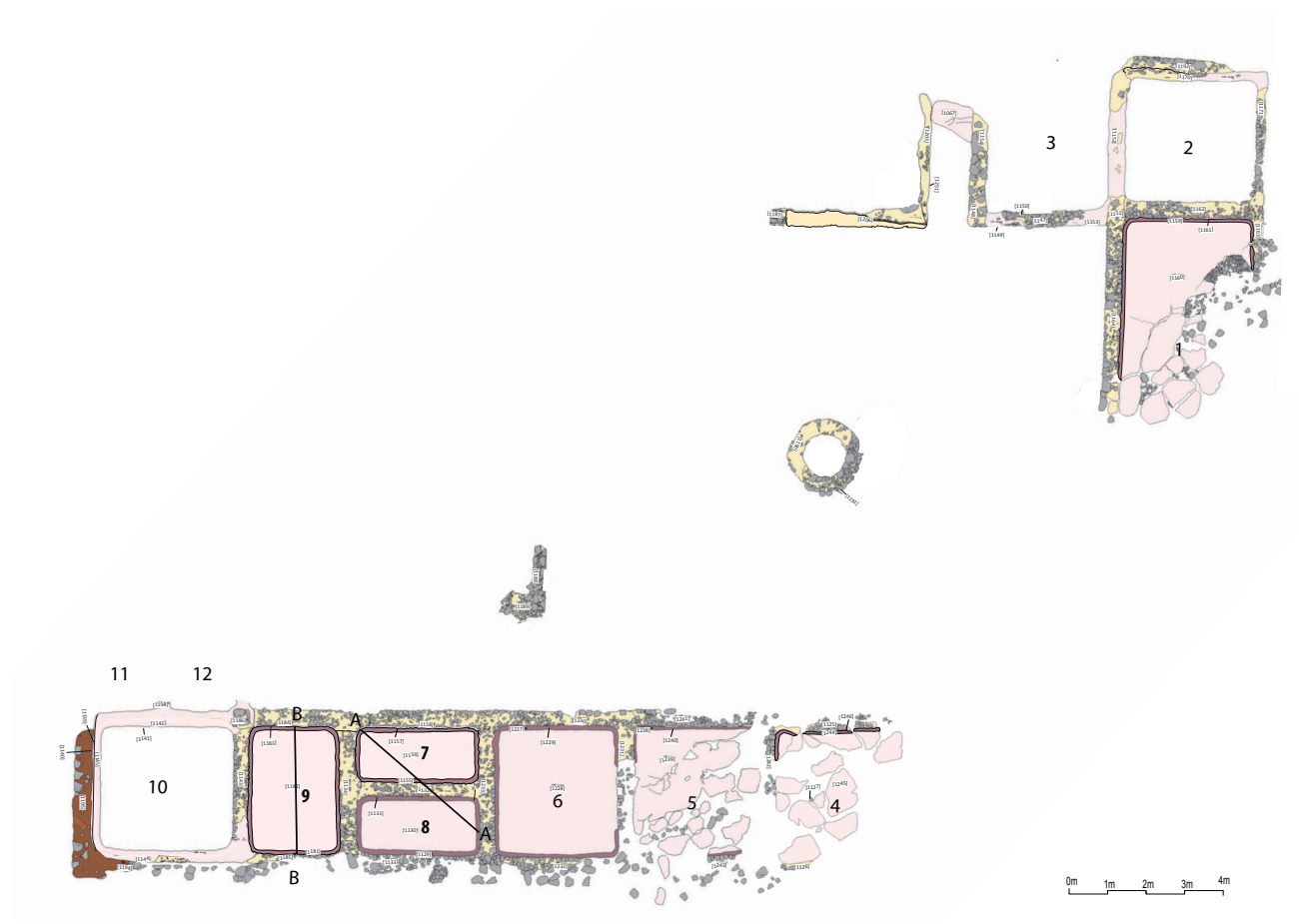


Fig. 3. Plan of Workshop 23 after the archaeological works in 2016.



Fig. 4. Photographs of vats during the excavation: (a) Drawing of the stone debris (S.U. [1072]) in Vat 7; b) View of the roof tile debris (S.U. [1094]) in Vat 8; c) View of the deposit of fish remains (S.U. [1172]) in Vat 9.

the structures and causing their progressive destruction. An archaeological intervention to collect all possible information and complete a photogrammetric survey was accomplished in June 2016 with students of the Troia Summer School.

At the time, the southern part of the Workshop had already been destroyed and the northern part remained under sand dunes, with only ten fish-salting vats visible, but after the work the complex was seen to measure c. 19 m wide, with a length of c. 31,5 m (**fig. 3**).

A sand deposit covered a large part of the Workshop, S.U. [1056], in which a Hayes 50 variant A/B dish in C3 fabric and a *sestercius* (inv. n. 15112) of the Emperor Severus Alexander (dating to AD 222-225) were found, among other less significant materials. Surprisingly, after the removal of this surface layer, it was clear that Vats 7, 8 and 9, despite being reached by the rising tides, and consequently having their filling moistened twice a day, still preserved archaeological deposits. The ceramic evidence contributed to the understanding of the rhythm of occupation and commercial dynamics of the production centre of Troia. It is here presented (**fig. 4**).

Vat 7

Vat 7, with a capacity of 15 m³, had its southeast wall partially destroyed by the tides and its preserved filling was less than 1 m high (**fig. 5**). Several debris deposits were exposed, mainly corresponding to episodes of roof collapse. Under the wall debris [1072], there was a natural sand deposit S.U. [1073], where several ceramic fragments were found: a Dressel 14, Variant C amphora (**fig. 6, 1**) dating from the 2nd century (Mayet and Silva 2002: 105-106; Raposo and Viegas 2016); fragments of the upper part of a Late Dressel 14 amphora (**fig. 6, 2**) of the late 2nd or early 3rd centuries (Mayet and Silva 1998: 114-115); a Keay 16A (**fig. 6, 3**), from the end of the 2nd century to 3rd century (Keay 1984: 149-153; Bernal 2001: 281). Finally came a fragment of an African amphora handle (**fig. 6, 4**) (with a second fragment found in Vat 8, S.U. [1091]), typical of the classical African I and II amphorae, '*anse en ruban avec profil en oreille*' dating from the end of the 2nd century in the case of the African I and African II A types, until the 4th century in the case of the

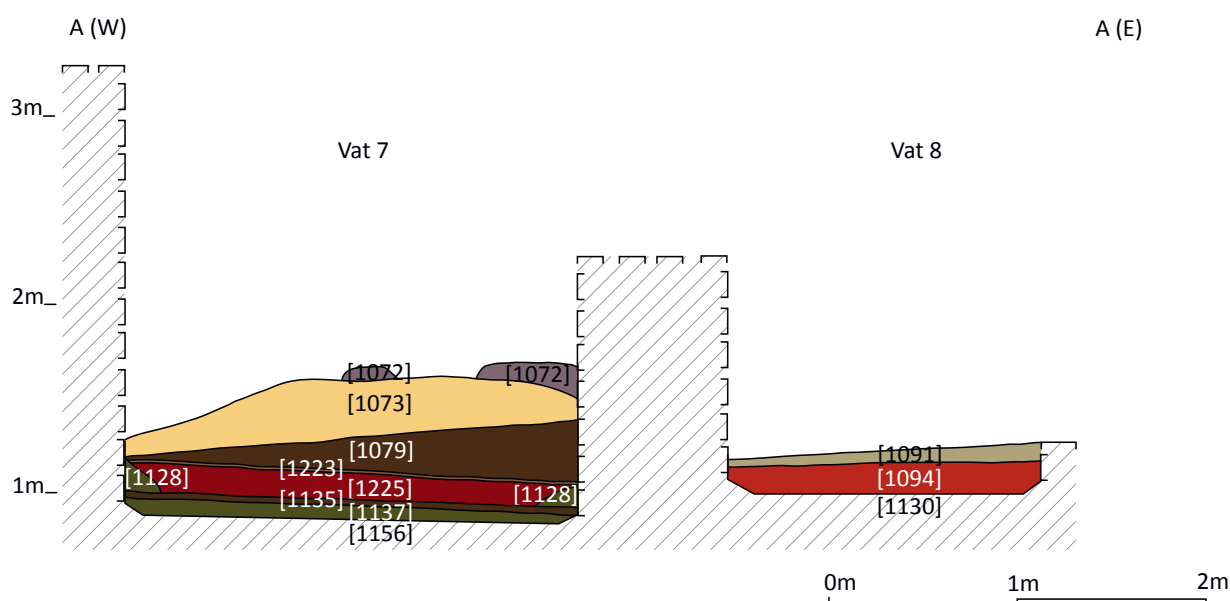


Fig. 5. Section of Vats 7 and 8.

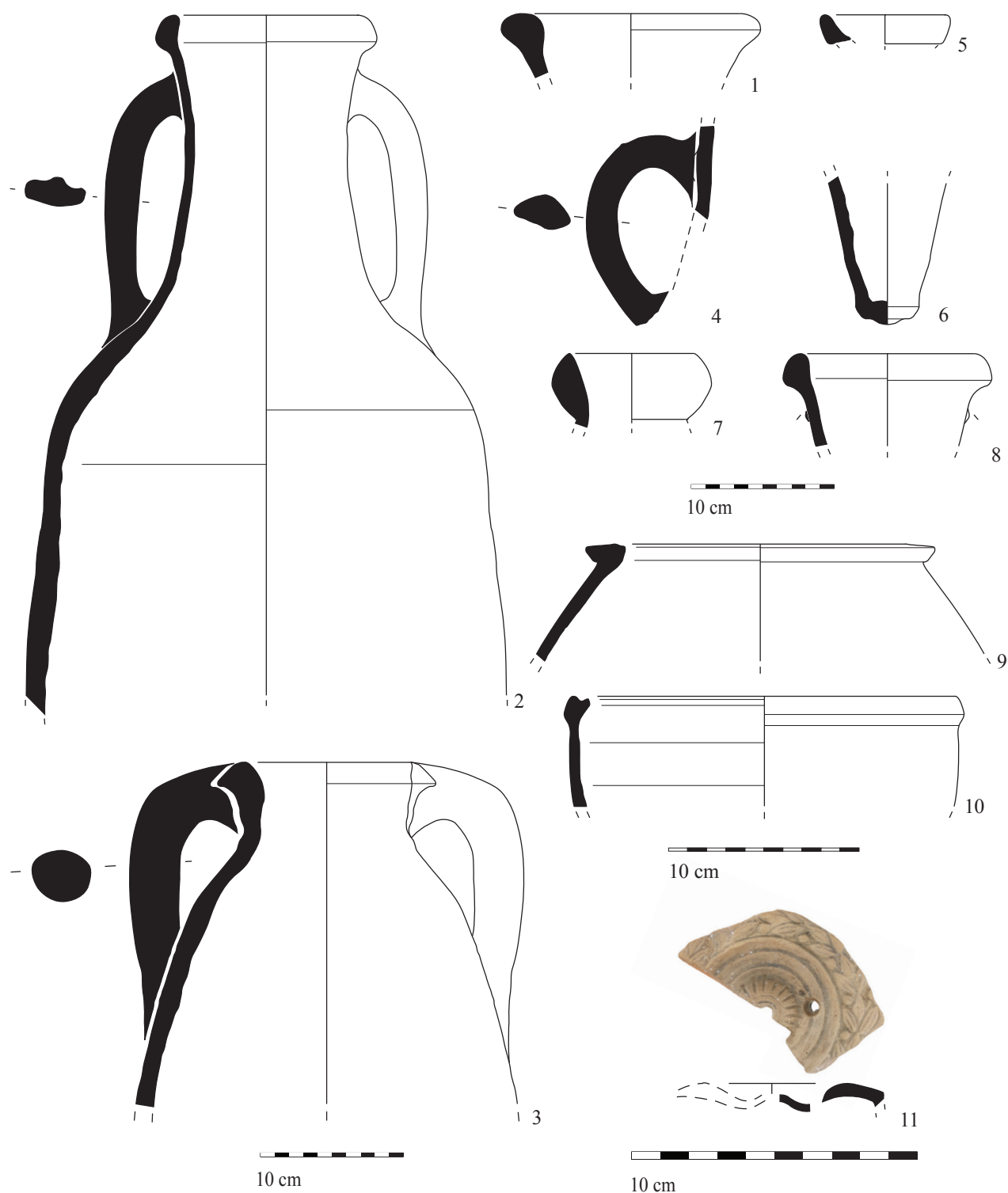


Fig. 6. Ceramics from Vats 7 and 8.

African II C and African II D types (Bonifay 2004: 106-117). The debris unit [1079], with bricks and tiles, revealed a small fragment of an Almagro 51c amphora with a triangular rim (**fig. 6, 5**), probably a Variant B as appearing in the kiln site of Abul in the second quarter of the 3rd century (Mayet and Silva 2002: 168-169) and perhaps in the beginning of the 3rd century at the workshop of Pinheiro (Mayet and Silva 1998: 56). S.U. [1223]

was a thin blackish sediment, possibly a paleo-soil, with a base of a probable Late Dressel 14 amphora (**fig. 6, 6**) and a rim fragment of African II C amphora (**fig. 6, 7**) from the second half of the 3rd century to 4th century (Bonifay 2004: 115). The removal of S.U. [1223] exposed more destruction units among which was S.U. [1236] with another Late Dressel 14 amphora (**fig. 6, 8**) and a handle of a Baetican Keay 16 or Almagro 50.

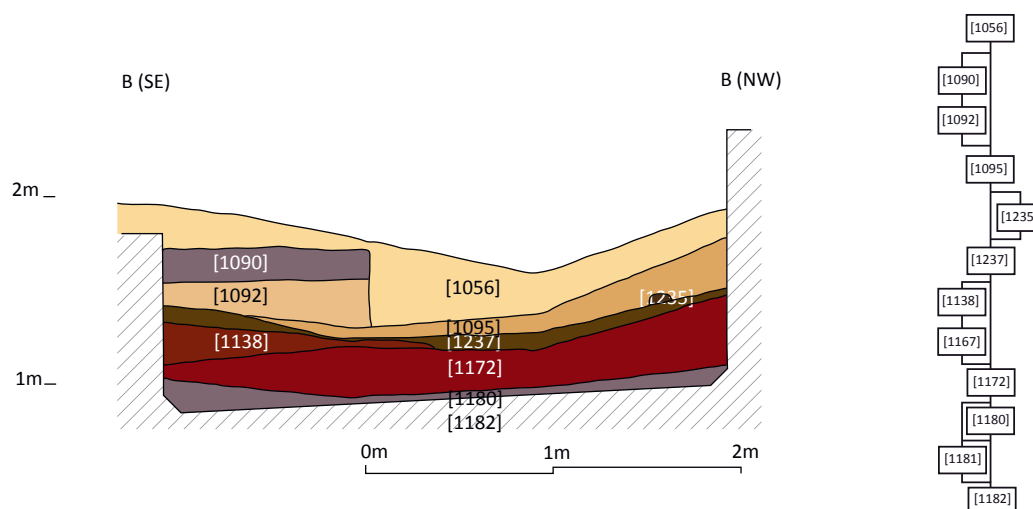


Fig. 7. Matrix and section of Vat 8.

Under these different destruction units, the layer of fish remains, S.U. [1137], deposited on the floor, S.U. [1156], was particularly interesting because it consisted of heads of mackerel over 30 cm long, with a minor portion of sardines, suggesting a specific fish product not previously documented in this site (Pinto et al. forthcoming). It was a thin layer with no material culture and only the deposits that sealed it suggested an *ante quem* date for its abandonment. It is important to note that the latest materials in this Vat are not earlier than the second quarter of the 3rd century and may have a longer chronological distribution.

Vat 8

Vat 8, slightly larger than its twin Vat 7, had a capacity of 18 m³ and had suffered greater destruction from coastal erosion, since it faced the waterline. It is curious to note that, even despite its filling being less preserved and the lack of fish remains, it revealed a similar stratigraphic sequence and indeed fragments of the same amphora were found in both Vats (fig. 5).

The top unit was a wall debris, S.U. [1091], daily affected by the tides, with both ancient and contemporary materials that revealed some pieces in regional fabrics, fragments of an *olla* (fig. 6, 9) and of a *casserole* (fig. 6, 10) similar to the 'marmite type Sidi Jdidi 4', most often found in the end the 3rd century (Bonifay 2004: 238-239, n. 3-4). The imported ceramics were a Deneauve VIII/1 lamp (Bonifay type 10, variant A) (fig. 6, 11) from the end of the 2nd century to 3rd century (Bonifay 2004: 328-329), the African II amphora handle, also found in Vat 7 (fig. 6, 4) and a Hayes 181 dish base in African Cooking Ware from the 2nd to the 5th centuries AD (Bonifay 2004: 328-329). Definitely from the 3rd century was a coin, an Antoninianus of Gallienus (AD 253-268) of the MARTI PACIFERO series.

S.U. [1093] was a sand layer over the roof tile debris S.U. [1094], equally affected by the tides. Both units revealed fragments of African Red Slip Ware type C, not earlier than the 3rd century. S.U. [1094], on top of the floor S.U. [1130],

also offered regional *caccabi* similar to São Cucufate VII-A-1 and VII-A-1-a forms (Pinto 2003: 316-320; 321-322), typical of the Early Empire. The greenish clay deposit (S.U. [1234]) over the floor was devoid of materials.

Vat 9

Vat 9 had a capacity of 30 m³ and only its southeast wall was relatively less damaged by the tides.

This Vat preserved a more intricate stratigraphy with a variety of debris and deposit units. Some of them, restricted to small areas, resulted from specific events of destruction or deposition and had few classifiable ceramics.

Both the rock debris S.U. [1090], in the southeast end of the Vat, and the clayey deposit S.U. [1095] had Almagro 51c amphora rims, that from the latter unit had the whitish slip typical of Variant B (fig. 8, 1). But the regional Dressel 14 amphora was the most abundant type in S.U. [1095], with three rims of Variant C (fig. 8, 2-3), three bases (fig. 8, 4-5), six handle fragments and many body fragments, as well as four fragments of *opercula* usually associated to the Dressel 14 amphora (Mayet and Silva 2002: 31). The regional coarse wares consisted of a bowl (fig. 10, 1) similar to the São Cucufate III-A-1 form, common in the Low River Sado workshops (Pinto 2003: 221-225), a pot (fig. 10, 2) difficult to classify, a cooking pot (fig. 10, 3) close to the São Cucufate VIII-C-1-b form with parallels in the Low Sado Valley (Pinto 2003: 379-381) and a small pot (not illustrated) possibly similar to the X-A-fr14 form, and finally an incomplete vessel (fig. 10, 4) that may be a pot, a jug or a small pitcher.

S.U. [1235] was a compact and homogeneous clayish sand deposit with Dressel 14 fragments, among which was a Variant C rim (fig. 8, 6), a complete *operculum* (fig. 8, 7), another possible pot, large jug or small pitcher, as well as metal fragments and a concentration of fish remains.

S.U. [1237] was a dense deposit with a great amount of fish remains, as well as amphorae and other ceramics,



Fig. 8. Amphorae from Vat 9.

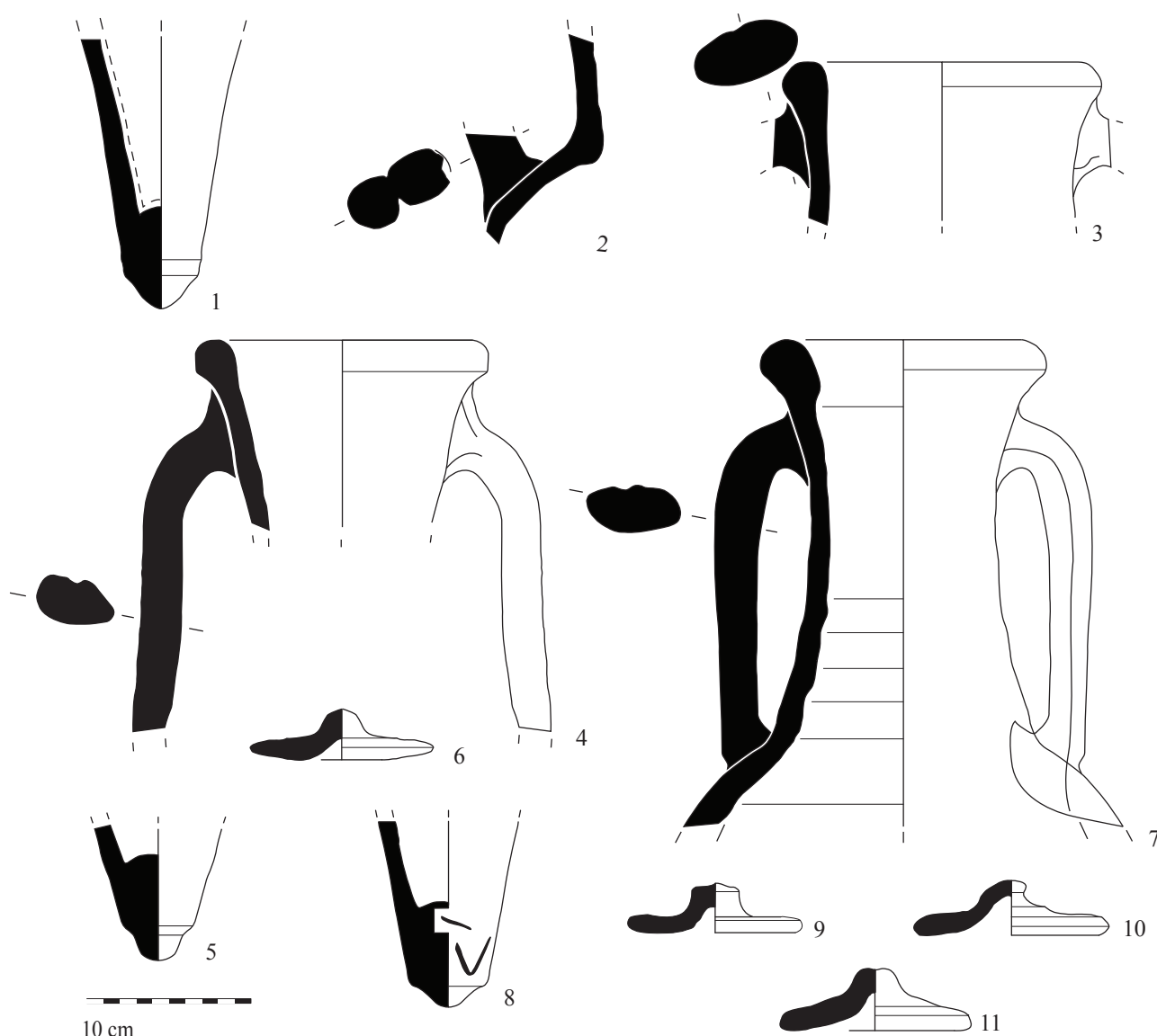


Fig. 9. Amphorae from Vat 9.

apparently discarded in the Vat after its abandonment. The ceramics included many Dressel 14 amphora fragments including a rim (fig. 8, 8) still holding an *operculum* upside down (fig. 8, 9), but loose and not sealed. There were ten more Dressel 14, Variant C amphora rims (fig. 8, 10-13), three bases (fig. 8, 14-15 and fig. 9, 1) and 13 handle fragments of the same type of amphora and three fragments of *opercula*. One handle fragment of a Dressel 2-4 amphora (fig. 9, 2) from Eastern Baetica/Málaga was also collected, a form generally produced in Baetica in the 1st and 2nd centuries. The coarse ware, all regional, consisted of a bowl similar to the São Cucufate III-A-1 form, a basin (fig. 10, 6) present in the Pinheiro workshop in the mid-4th century (Mayet and Silva 1998: 192-194, 254-255) but probably not exclusive to that period, a pot (fig. 10, 7) difficult to classify, three more pots (fig. 10, 8-9) equally difficult to classify and a jug São Cucufate XII-A-2-a.

Under S.U. [1237], the debris deposit S.U. [1138] had a Dressel 14, Variant C amphora (fig. 9, 4), a base of the same

type of amphora (fig. 9, 5) and a regional whole *operculum* (fig. 9, 6). S.U. [1167] was a mortar debris unit with some fish remains and a few ceramics including a Dressel 14, Variant C rim (fig. 9, 3). S.U. [1166] was a small clay deposit with only a Dressel 14 amphora handle and body fragments.

A deposit of fish remains S.U. [1172] was discovered under those units, interpreted as the remains of the last production in the Vat: it lay over a thin deposit of hard grey clay, S.U. [1180], presumably a reinforcement of the original floor of the Vat, S.U. [1182], an unusual practice at Troia, where this is the first occurrence in a vat.

S.U. [1172] had some Dressel 14 amphora fragments including four Variant C rims (fig. 9, 7), a Dressel 14 base with the 'V' *graffito* (fig. 9, 8) close to nos. 200-203 from Abul (Mayet and Silva 2002: 155), three handle fragments and a fragment of a fish-product amphora handle from coastal Baetica, possibly a Beltrán II amphora, from the 1st to 2nd centuries. There was also an unusual number of *opercula*, a total of 21 individuals of which six were complete (fig. 9, 9-11), and a surprising amount

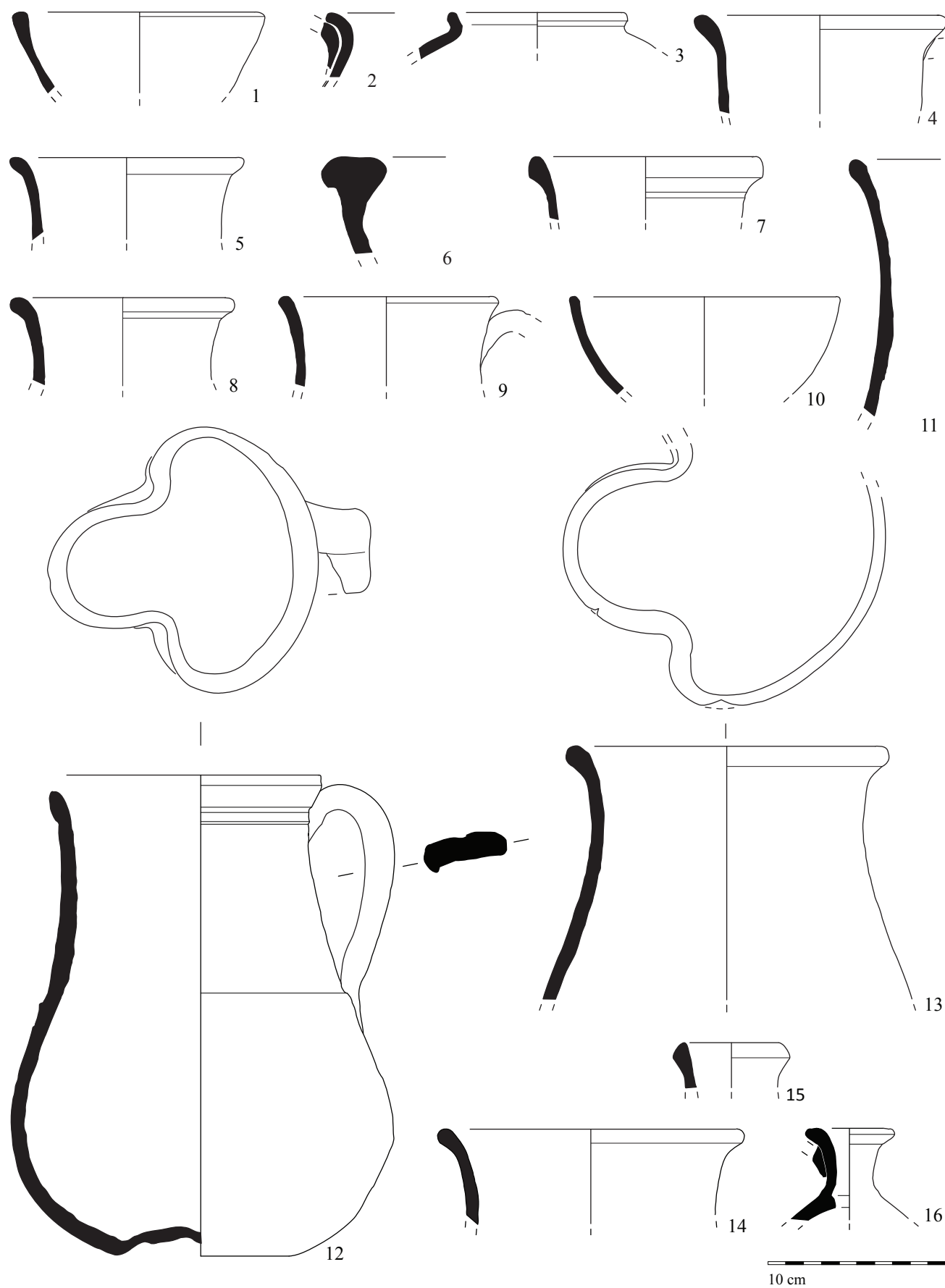


Fig. 10. Coarse ware from Vat 9.

of trefoil pitchers among the coarse ware. These included, according to the São Cucufate typology, four pitchers XI-A-1 (fig. 10, 11-13), another pot or pitcher (fig. 10, 14), two jugs (fig. 10, 15-16), possibly São Cucufate XII-C-2 and XII-A-2-a forms, and two lids similar to the S. Cucufate XIV-A-1 form.

S.U. [1180] contained a Dressel 14 amphora handle, body fragments of the same type of amphora, a minimum number of 10 *opercula*, fragments of a bowl III-A-1 (fig. 10, 10), another pot difficult to classify, a trefoil pitcher XI-A-1, various coarse ware bases and fragments of vessels from S.U. [1172] such as a pitcher (fig. 10, 12) and a jug (fig. 10, 16).

The presence of Almagro 51c amphorae in the upper units of Vat 9 indicate that these deposits are not earlier than the 3rd century, as was the case with the upper deposits of Vats 7 and 8. Yet the abundance of the Dressel 14, Variant C amphora in the units below S.U. [1095] points to a slightly earlier abandonment of the production, possibly in the 2nd century.

The absence of Almagro 51c or late 2nd to 3rd centuries African Red Slip types, only present in the upper layers, suggests the abandonment of the production in Vat 9 occurred before the 3rd century.

Compared to the Dressel 14 amphorae from Pinheiro or Abul, all the individuals recovered in Vat 9, most of them presented in figs. 8-9, may be classified as Variant C according to their rims, since bases and handles do not vary significantly among variants. In three cases (fig. 8, 2, 9, 10 and 9, 3) we hesitated on the classification as Variant B or C, since these rims were neither as angular as the typical Variant B rim nor as thick as the most common Variant C rims; rounded, their closest parallels are with the Abul amphorae fig. 67, 70-71 of Variant C (Mayet and Silva 2002: 145). Other individuals, such as fig. 8, 6, 9-13 and 9, 4 present rims tending to a quadrangular shape, considered as the latest tendency of Variant C (Mayet and Silva 1998: 64) and indicating that these contexts are not earlier than the second half of the 2nd century.

From another perspective, these contexts are particularly interesting because they attest to 'industrial' refuse in which Dressel 14 amphorae appear associated with many *opercula*. Moreover, the four pitchers found in the fish remains deposit were regionally produced and of a similar form, classified as XI-A-1 in São Cucufate, where such occur in contexts from the 1st to the 5th centuries, also appearing in funerary contexts of the 1st to early 2nd centuries at the necropolises of Valdoca (Aljustrel) and Santo André (Montargil) (Pinto 2003: 442), but not well documented in the workshops of the Low Sado Valley. Their regular dimension and their wide trefoil rim, which would be difficult to seal with a lid for transport, suggest they would be used inside the workshops, possibly to fill up the amphorae.

3. Discussion

In terms of ceramic types, the most frequent in the contexts of Vats 7, 8 and 9 is the Dressel 14 amphora, a fish-product container used for both salted fish and fish sauces (Pinto et al. forthcoming). This form monopolized the transport of fish products from the Low Sado River in the second half of the 1st century and 2nd century (Almeida et al. 2014a: 658), and

especially in its Variant C. This variant, characterized by a rounded rim, was taken, in the Sado workshops of Pinheiro and Abul, as the typical container of the 2nd century (Mayet and Silva 1998: 63; 2002: 105-106), following on from the Variant B with its triangular rim, typical of the second half of the 1st century. Variant C still appears, in the workshop of Pinheiro, in a context with a few Late Dressel 14, Lusitana 3 and Hayes 14/17 in African Red Slip type A, that may reach into the early 3rd century (Mayet and Silva 1998: 51 and 115); but, in our opinion, its production in the 3rd century is not proven.

The previous finds of Dressel 14 in stratigraphic contexts at Troia generally agree with the above data, since Variant C has not appeared, so far, in 1st century contexts and it is the most frequent amphora in those of the 2nd century. Variant B, present in a late 1st century to early 2nd centuries-context in Workshop 12 (Almeida et al. 2014b: 411) still appears, even if in a minor way, in most contexts of the 2nd century in Workshops 1 and 2 (Pinto, Magalhães and Brum 2010a; 2010b; Pinto, Magalhães and Brum 2018). The Dressel 14, Variant C is still well represented in a second quarter to mid-3rd century context ([722]) related to the remodelling of Workshop 1, next to the well, but is accompanied with frequent residual material (Pinto, Magalhães and Brum 2010a: 139-140).

The contexts of Vat 9 – where the Dressel 14, Variant C, with different rim versions, seems to be the unique regional type of amphora – confirm the preponderance of Variant C in the second half of the 2nd century and document the abandonment of the fish-salting activity in Workshop 23 in that period.

The transition from the canonical Dressel 14, variant C to the short term and smaller Late Dressel 14 is another open question. This last type appears in the referred context of Pinheiro with Dressel 14, variant- C, Lusitana 3 and African Red Slip type A Hayes 14/17 and therefore has with a rather broad time span for its first occurrence, to within the second half of the 2nd century to early 3rd century. In the absence of fine wares able to offer more precise dates, the contexts of Workshop 23 do not help in clarifying that transition. Yet, it is worth noting that the Late Dressel 14 is not present in the presumed 2nd century-abandonment contexts of Vat 9, while it is found in the top units of Vat 7 along with Dressel 14, Variant C and also Almagro 51c, dating this context to the 3rd century.

Imported amphorae are rare in these contexts. A Dressel 2-4 from Eastern Baetica/Málaga, a Keay XVI and a few amphora handles from the Baetican Coast/Cádiz testify to the strong trade connections with Baetica in the Early Empire, continuing on into the 3rd century. The African II amphora handle, African Red Slip and African cooking ware fragments or imitations testify to the promising trade with Roman Africa: beginning in the late 2nd century, this will grow in the following centuries (Almeida et al. 2014a: 655).

As a matter of fact, the ceramics in the contexts of Vat 9 consist mostly of regional amphorae, with but a few fine and coarse wares, suggesting 'industrial' rather than domestic refuse. Several pitchers stand out and must be connected to the production activity, possibly to fill up the amphorae. The abundance of *opercula* is also striking, suggesting the amphorae were sealed nearby.

These contexts definitely document the end of the first phase of production in the fish-salting production centre of

Troia, previously dated to the second half of the 2nd century to early 3rd century in Workshops 1 and 2 (Pinto, Magalhães and Brum 2018: 155-156).

However the upper deposits in all three Vats revealed 3rd century materials such as African Red Slip type C, Almagro 51c and an Antoninian coin of Gallienus. None of those items is directly related to the fish-salting production, but they document human presence in Workshop 23 during the 3rd century. Were Vats 7 and 8 in use until the 3rd century? Or is this an indirect evidence of the reactivation of the fish-salting production in the second phase of production (3rd-4th centuries) in a different area of the Workshop? Or simply the vestiges of people living in the area?

The Workshops 12 and 13, located at Recanto do Verde, 0,7 km southeast of Workshop 23 on the shoreline, had revealed an abandonment in the late 1st to early 2nd centuries (Pinto, Magalhães and Cabedal 2014; Almeida et al. 2014b: 411). The abandonment of the production in Workshop 23 in the second half of the 2nd century reinforces the observation on the progressive deactivation of the southeastern Workshops of the industrial settlement, whether for natural or economic

factors, while others in the northwestern area, such as Workshops 1 and 2, were reactivated in the 3rd century and were operating until the second quarter of the 5th century.

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