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## Amphorae and Coarse Ware Fabrics of Punic Selinus: Evidences for Local Production and Export\*

### Introduction

Currently, research on pottery production in Punic Selinus is at a very initial stage. Despite the discovery, during the 70s and 80s, of several ceramic kilns in 'isolato FF 1' and in the south-eastern part of the acropolis (see ch. 2), no systematic study of these archaeological remains and their contexts has yet been presented. Very recently, previous archaeometric investigations have been supplemented with in-depth research into the possible raw materials used by ancient potters, based on new petrographic and chemical analyses of



**Fig. 1. The sampling sites yielding amphorae from Selinus.** Fragment chronology as follows: Blue 4th century B.C.E. Red 3rd century B.C.E.

\* Special thanks are due to S. Gallagher, University of Warwick, for his critical input during the correction phase of the English manuscript. Furthermore, I thank R. Lampl, University of Vienna, for the photographic documentation of the samples, the realisation of Figs. 1-2, the digitalisation of all amphorae drawings and the composition of Fig. 3.

materials yielded by the kilns of 'isolato FF 1' (see ch. 1).

Against this background of still-embryonic knowledge about pottery production in 4th to mid-3rd century B.C.E. Selinus, the contribution of the present project represents only one small step towards a better definition of the local ceramic industry during the Punic period. As such, only eleven samples, from Selinus<sup>1</sup> itself and from Entella<sup>2</sup>, have been studied, using binocular microscopy and digital photos of freshly broken surfaces (at x8, x16, and x25 magnification). Eight items from this assemblage have been selected for archaeometric analyses.<sup>3</sup> On the basis of these new evidences, in ch. 3-4 we re-assume the amphora repertoire currently documented for Punic Selinus, while in ch. 5 we present a preliminary interpretation of the available data.

## 1. Archaeometric research and provenance of row materials

Initial archaeometric research on pottery production in Selinus was based on petrographic and chemical analyses of 42 western Greek and Punic amphorae fragments, kiln wastes and tiles of unspecified provenance.<sup>4</sup> The principal result of this study was the distinction of two different local fabrics: the first, which is of fine texture, has been referred in almost all cases to 5th century B.C.E. western Greek amphorae, while the coarser 'impasto II' is mostly used for Punic amphorae of Ramon's T-5.2.3.1/3.2. This latter fabric is characterised by the presence of relevant quantities (15%-35%) of natural temper, chiefly fine sand (basically quartz). Carbonate particles (very frequent to rare) can be distinguished in low fired items, whereas lime clots and pores characterise fragments fired at higher temperatures. Both fabrics fit well with the archaeometric features of the reference samples for local

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<sup>1</sup> I am very indebted to C. Marconi, director of the excavations (2006-2012 campaigns) of the New York University, Institute of Fine Arts, at temple B for allowing the possibility to study the Hellenistic finds, see Bechtold (forthcoming). I am also indebted to C. Greco, then director of the Parco Archeologico di Selinunte e Cave di Cusa 'Vincenzo Tusa', for generous sampling permission. Furthermore I thank D. Mertens, H. von Hesberg (both then DAI Rome) and S. Helas (Universität Bonn) for the permission to consider for the present study 15 samples referring to Punic amphorae yielded by the acropolis excavations of the DAI and published in Helas 2011. The amphorae samples from Selinus have been assigned the FACEM site identification number 'M 154'.

<sup>2</sup> I thank M. Quartararo (Pisa) and A. Corretti (Scuola Normale Superiore di Pisa) for allowing the possibility to consider, within the framework of the present research, the samples of two amphorae from the excavations of the Scuola Normale Superiore di Pisa at Entella and already characterised by archaeometric analysis (Montana et al. 2015; Quartararo 2012). For an overview of the assemblage of the Punic amphorae from Entella, see Quartararo 2015a. The samples from Entella have been assigned the FACEM identification number 'M 187'.

<sup>3</sup> G. Montana and L. Randazzo (both Università degli Studi di Palermo), in preparation. Laboratory methodologies applied in this study include thin-section petrography and chemical analyses (combination of Lithium Metaborate/Tetraborate fusion – ICP and ICP/MS).

<sup>4</sup> Azzaro et al. 2006.

production formed by tiles and wasters. In contrast to the fine texture of 'impasto I' without additive temper, the artefacts referred to 'impasto II' '(...) possono essere ricondotti a diversa tecnologia di manifattura che prevede l'aggiunta, al materiale argilloso naturale, di una frazione di sabbia medio-fine, facilmente ripetibile in prossimità della foce del fiume Modione.'<sup>5</sup>

Very recently, G. Montana has proposed initial hypotheses on the raw materials used by the potters of ancient Selinus, possibly recognised in the Pleistocene formations with outcrops just outside the fortification.<sup>6</sup> In parallel, the same author<sup>7</sup> has analysed a misfired amphora of Ramon's T-5.2.3.2<sup>8</sup> found in the destruction level of kiln 3 in 'isolato FF 1 Nord', dated to the Roman conquest of the town in 250 B.C.E.

## 2. Industrial areas

Three pottery kilns of the Punic phase of Selinus, unearthed on the acropolis in 'isolato FF 1 Nord' during the 70s and 80s, have very recently been the object of a specific paper published by their excavator, Martine Fourmont.<sup>9</sup> Together with three more apparently unpublished kilns discovered in the south-eastern part of the acropolis,<sup>10</sup> these consistent structural remains provide clear evidence of the existence of several local ceramic workshops on the acropolis of Punic Selinus. In particular, the 'Casa atelier' of 'isolato FF 1' has yielded two circular kilns and a basin for water: kiln 1, excavated in 1941 and badly preserved, and kiln 2, destroyed by cannon balls during the Roman attack of 250 B.C.E.<sup>11</sup> as well as during the Medieval period and in 1941. Part of its original filling has been found below the collapse of its elevated portion. Furthermore, in the 'Casa della fornace 3', north-west of

<sup>5</sup> Azzaro et al. 2006, 222-3.

<sup>6</sup> Montana 2013, 3-4 '(...) molto verosimile pensare che la materia prima utilizzata nelle officine ceramiche di Selinunte sia stata l'argilla del Pleistocene inferiore estesamente affiorante poco al di fuori delle mura.'

<sup>7</sup> Montana 2013, 1-2.

<sup>8</sup> For the amphora, see Fourmont 2013, 20, fig. 20,1-2. M. Fourmont identifies this misfired fragment with Ramon's T-4.2.1.6. However, according to the present author, the clearly elongated, inwards-sloping rim should rather be referred to shape T-5.2.3.2 (Ramon 1995, 531-2, figs. 168-9) which appeared to be, by instance, the key-type of the local Punic production established by the first archaeometric study of 2006 (Azzaro et al. 2006, 221). Furthermore, amphorae close to Ramon's T-5.2.3.2 or also T-4.2.1.3 are documented in the same kiln context of 'fornace 3' (see Fourmont 2013, 21, figs. 21,1-2, 22, here defined as Ramon's T-4.2.2.6).

<sup>9</sup> See Fourmont 2013, esp. 3, figs. 1-2 with earlier references.

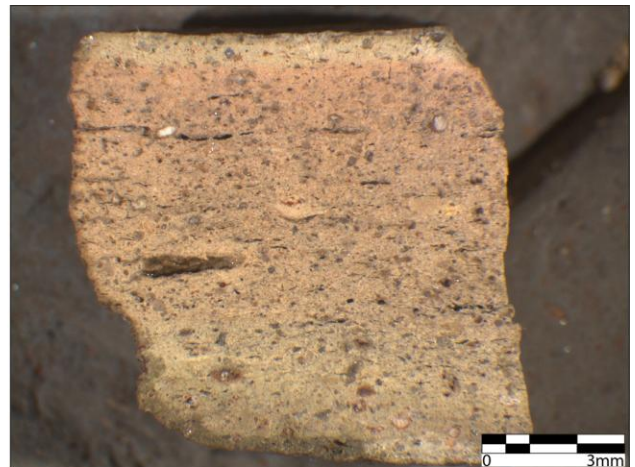
<sup>10</sup> Excavations of the Soprintendenza BB.CC.AA. di Palermo, mentioned in Fourmont 1992, 60 and marked on enclosure 6 of Helas 2011.

<sup>11</sup> Fourmont 2013, 25-6.

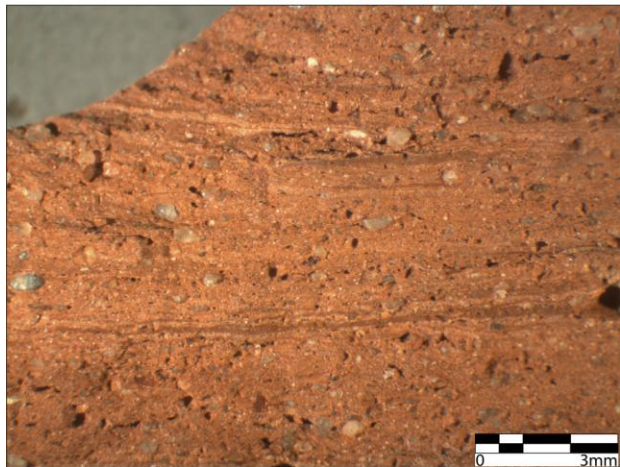
the former area, a third, ovoid-shaped kiln has been discovered.<sup>12</sup> According to M. Fourmont, the three kilns of 'isolato FF 1' produced roughly similar plain ware types,<sup>13</sup> of which some amphorae from kiln 3 have been partly presented (see ch. 3).<sup>14</sup>



1



2



3



4

**Fig. 2. Fabrics from Selinus (at x8 magnification). 1. SEL-A-1. 2 SEL-A-2. 3. SEL-A-3 4. SEL-C-1.**

<sup>12</sup> Fourmont 2013, 3-5.

<sup>13</sup> Fourmont 2013, 15.

<sup>14</sup> Fourmont 2013, 16-23.

### 3. Amphorae fabrics and morphological repertoire of Punic Selinus: evidences from Selinus itself

Combined with the results of archaeometric analyses, the study of the very small assemblage of only 8 samples available within the framework of the present project has allowed us to distinguish three different fabrics (in detail, see below Schmidt): the very fine **SEL-A-1** (fig. 2,1), possibly similar to 'impasto I' of the archaeometric study quoted above (see ch. 1), **SEL-A-2** (fig. 2,2), which is characterised by an additive quartz temper which corresponds to 'impasto II', and the yet coarser **SEL-A-3** (fig. 2,3).

M. Fourmont's recent contribution on the kilns of 'isolato FF 1' masterly illustrates at least part of the repertoire produced during the decades preceding the Roman conquest of the city in 250 B.C.E.<sup>15</sup> Misfired amphora fragments from Fourmont's excavations attest unequivocally to the local production of the following types: Ramon's T-4.2.1.5 (for the type see fig. 3,3)<sup>16</sup> and, derived from this former type, vessels close to Ramon's T-4.2.1.3<sup>17</sup> and 5.2.3.2 (for the type see fig. 3,4),<sup>18</sup> in addition to Ramon's T-3.2.1.2 (fig. 3,6)<sup>19</sup> and amphorae lids with internal lid setting.<sup>20</sup> The samples studied within the framework of the present project confirm the documentation of Ramon's T-4.2.1.5 (fig. 3,3)<sup>21</sup> (probably from the late 4th to early 3rd century B.C.E. onwards), T-5.2.3.2 (fig. 3,4)<sup>22</sup> and T-5.2.3.1 (fig. 3,5),<sup>23</sup> the latter of which are from around the mid-3rd century B.C.E.<sup>24</sup>

<sup>15</sup> According to M. Fourmont 2013, 26, the latests ceramic elements of the archaeological level covered by kiln 3 date to the early 3rd century B.C.E. The discovery of an amphora fragment of Ramon's T-3.2.1.2 in the same context (Fourmont 2013, 17, note 14) seems even to lower the dating of kiln 3 to the mid-3rd century B.C.E.

<sup>16</sup> Fourmont 2013, 19-20, fig. 19.

<sup>17</sup> Fourmont 2013, 21, figs. 21,1-2, 22 by Fourmont attributed to Ramón's T-4.2.2.6, but in our opinion very similar to the shape illustrated in Fourmont's fig. 20 and close to Ramón's T-4.2.1.3.

<sup>18</sup> Fourmont 2013, 20, fig. 20,1-2, by Fourmont attributed to Ramón's T-4.2.2.6, see above note 8. More items of this shape have been attributed to the local production in Azzaro et al. 2006, 221.

<sup>19</sup> Fourmont 2013, 17-8, fig. 17,1-2; 31, tab. 4, inv. 83/γ583.

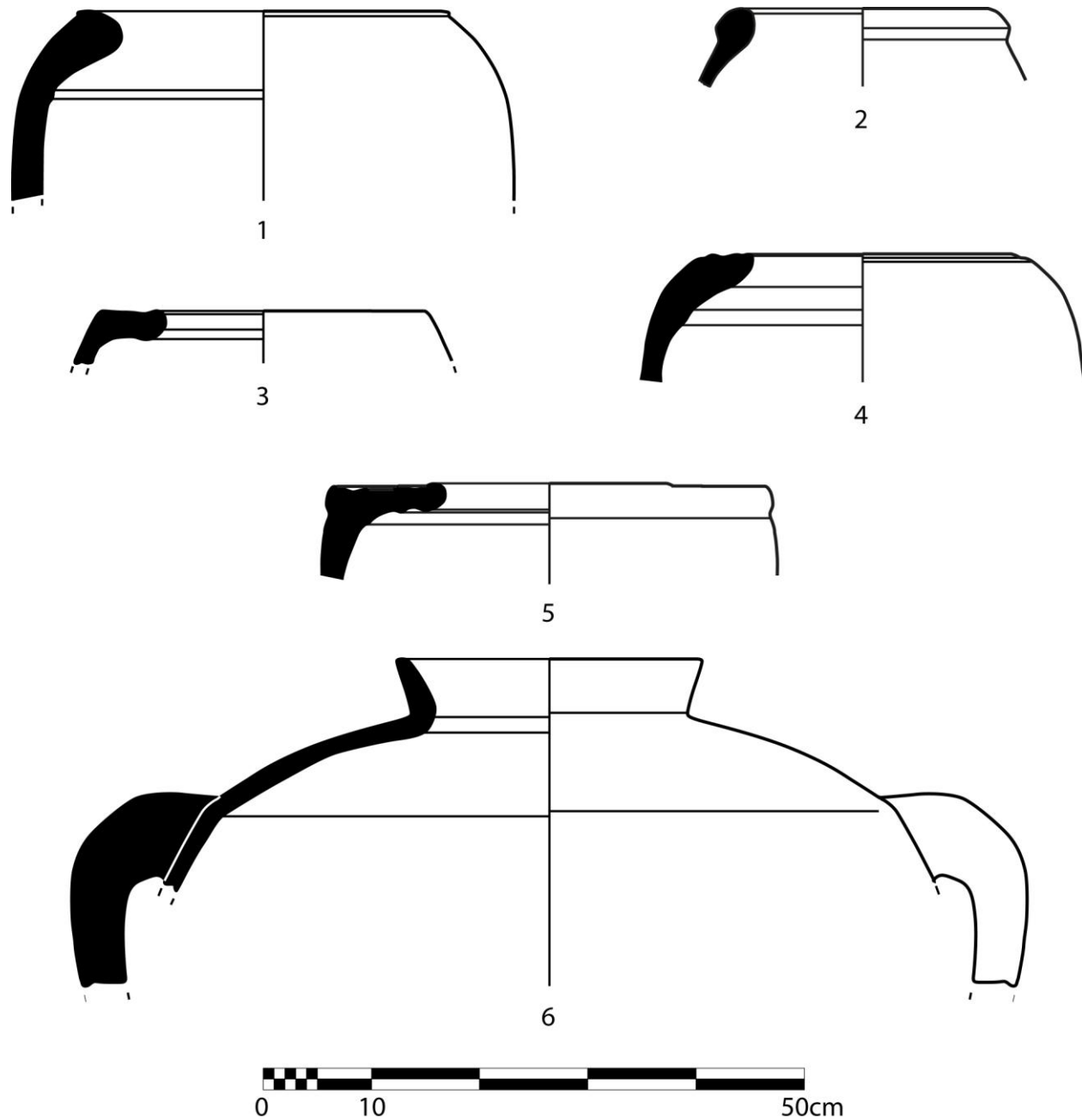
<sup>20</sup> Fourmont 2013, 16-7, fig. 16,1-2; 30-1, tab. 3. At least one of these lids has been referred to an amphora of Ramon's T-4.2.1.5.

<sup>21</sup> FACEM – <http://facem.at/m-154-15>, in SEL-A-2, from a late 4th/early 3rd B.C.E. deposit excavated at temple B (Bechtold (forthcoming), cat. 71). FACEM – <http://facem.at/m-154-89>, in SEL-A-3, from a closed context dated to the last third of the 4th century B.C.E. (published in Helas 2011, 305, from saggio M 96, US 1, SL 12746).

<sup>22</sup> FACEM – <http://facem.at/m-154-88>, in SEL-A-2, from a deposit presumably of the mid-3rd century B.C.E. (published in Helas 2011, 338, from saggio A3, 2000, US 19, SL 23905).

<sup>23</sup> FACEM – <http://facem.at/m-154-82>, in SEL-A-3, from a deposit presumably of the mid-3rd century B.C.E. (published in Helas 2011, 342, pl. X 46,9, from saggio B2, 2000, US 25, SL 23954). M 154/83 in SEL-A-2, from a deposit presumably of the mid-3rd century B.C.E. (published in Helas 2011, 334, pl. 46,10, from saggio A3, 2000, US 16, SL 23838).

<sup>24</sup> For the ascertained local production of this shape see Azzaro et al. 2006, 221.



**Fig. 3. The amphora repertoire of Punic Selinus. 1.** Toti T18 **2.** Ramon T-8.1.1.1 **3.** Ramon T-4.2.1.5 **4.** Ramon T-5.2.3.2 **5.** Ramon T-5.2.3.1 **6.** Ramon T-3.2.1.2.

#### 4. First indications for coarse ware fabrics of Punic Selinus

Three samples taken from a basin, a mortar and a table amphora yielded by the early Hellenistic deposits excavated at temple B provide evidence for a very fine-grained coarse ware production labelled as **SEL-C-1** (fig. 2,4) and close to the amphora fabric SEL-A-1 (see below, Schmidt).

#### 5. Amphorae fabrics and morphological repertoire of Punic Selinus: evidences from other sites

Outside the production side, only Entella has so far yielded a couple of 4th century BC amphorae which match the chemical and petrographical markers of the raw materials of Selinus: one item of the typical Motyan shape Toti's T18 (fig. 3,1)<sup>25</sup> and one fragment attributed to the Ebusitanian shape Ramon T-8.1.1.1 (fig. 3,2)<sup>26</sup>. Both these types are still not attested at Selinus itself.

#### 6. Concluding remarks on Selinus' amphorae repertoire

Evidences for amphorae production in Punic Selinus are still extremely scarce. The earliest items are still dated within the 4th century B.C.E. and have been attributed, using archaeometric analyses, to the series of Selinus stemming from Entella. They refer to the typical Motyan type Toti's T18 (fig. 3,1) and to the Ebusitanian type Ramon T-8.1.1.1 (fig. 3,2).

From the late 4th to early 3rd century B.C.E. onwards, with the documentation of the highly characteristic Carthaginian shape Ramon T-4.2.1.5 (fig. 3,3)<sup>27</sup>, archaeological evidences for a local production become slightly more consistent. In this regard, it seems significant that, almost contemporaneously, this shape also becomes the key type of nearby Lilybaion (see Bechtold 2015).

As a direct evolution of the above-mentioned type T-4.2.1.5, Ramon's T-5.2.3.2 (fig. 3,4) and T-5.2.3.1 (fig. 3,5) appear no earlier than the mid-3rd century B.C.E. and certainly only a few years before the Roman attack of 250 B.C.E. All these shapes are well documented in the latest levels of the Punic 'Ladenstoa' (ch. 3), in the industrial quarter 'FF 1' (ch. 2) and among the local amphorae taken into consideration for the archaeometric study presented in 2006 (see above, ch. 1). The ascertained

<sup>25</sup> FACEM – <http://facem.at/m-187-8> in SEL-A-2 (published in: Montana et al. 2015, 817, 824, tab. 3, ANF 003. Quartararo 2012, ANF 003), see Quartararo 2015a.

<sup>26</sup> FACEM – <http://facem.at/m-187-19> in SEL-A-1, see Quartararo 2015a.

<sup>27</sup> Bechtold 2012, 4 with earlier references.

production – and perhaps also, by consequence, the 'invention'- of type T-5.2.3.1 at Selinus around 250 B.C.E. represents one of the most important archaeological novelties, since its appearance in North Africa has traditionally been placed after the abandonment of Kerkouane in 256 B.C.E.<sup>28</sup> J. Ramon has already noted, however, the presence of a relevant number of fragments of his shape T-5.2.3.1 in the superficial levels of the acropolis of Selinus and among the materials yielded by V. Tusa's excavations in the so-called 'aree sacre' at the southern part of the acropolis.<sup>29</sup>

By consequence, and in parallel with Lilybaion (see Bechtold 2015), we can state that from the late 4th or early-3rd century B.C.E. onwards, Selinus' workshops produced the amphora key types of the North African metropolis. This phenomenon ought to be interpreted as an indication of strong political and cultural relations between the two south-western Sicilian Punic towns and Carthage itself.<sup>30</sup> As a hypothesis, we might suggest that, from the beginning of the 3rd century B.C.E. onwards, Carthage directly influenced the industrial output of its Sicilian strongholds located along the south-western coast, also underlining their dependence on the mother-town by the deliberated use of North African amphorae shapes. Finally, Selinus also produced vessels of Ramon's T-3.2.1.2 (fig. 3,6), otherwise documented among the production of Melite (Malta).<sup>31</sup>

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<sup>28</sup> Ramon 1995, 197-8.

<sup>29</sup> Ramon 1995, 130, here associated with amphorae of Ramon's T-3.2.1.2.

<sup>30</sup> For this topic, see Bechtold 2013a, esp. 21, 23 with further references.

<sup>31</sup> FACEM – <http://facem.at/m-119-42>. FACEM – <http://facem.at/m-115-6>. FACEM – <http://facem.at/m-119-239>, from site 1 of Cala Tramontana (Pantelleria), a deposit dated around the mid-3rd century B.C.E. (Baldassari 2012, 195-7, fig. 5,6, 'reperto' 465) and highly important in view of the still vague chronology of Ramon's T-3.2.1.2.



**Table of correspondence for the fragments illustrated in fig. 3.**

Fig.	FACEM inv.-no.	Site inventory number	Published
3,1	M 187/8	Entella, Sas 30, US 30001, inv. E. 5511 (ANF 003B)	FACEM – <a href="http://facem.at/m-187-8">http://facem.at/m-187-8</a> Quartararo 2012. Quartararo 2015a
3,2	M 187/19	Entella, SAS 24, US 24016 (ANF 063)	FACEM – <a href="http://facem.at/m-187-19">http://facem.at/m-187-19</a> Quartararo 2012. Quartararo 2015a
3,3	M 154/15	Selinunt, temple B, saggio E, US 1, P08.506	FACEM – <a href="http://facem.at/m-154-15">http://facem.at/m-154-15</a> Bechtold (forthcoming), cat. 71. Bechtold 2015b, fig. 3,1
3,4	M 154/88	Selinunt, acropolis, 'punische Ladenstoa', saggio A3, 2000, US 19, SL 23905	FACEM – <a href="http://facem.at/m-154-88">http://facem.at/m-154-88</a> . Helas 2011, 338. Bechtold 2015b, fig. 3,2.
3,5	M 154/82	Selinunt, acropolis, 'punische Ladenstoa', saggio B2, 2000, US 25, SL 23954.	FACEM – <a href="http://facem.at/m-154-82">http://facem.at/m-154-82</a> . Helas 2011, 342, pl. X 46,9. Bechtold 2015b, fig. 3,3.
3,6	--		From: Fourmont 2013, fig. 17,2. Bechtold 2015b, fig. 3,4.

KARIN SCHMIDT

## Amphorae and Coarse Ware Fabrics of Selinus

### Introduction

Earlier archaeometric analysis<sup>1</sup> undertaken on 42 amphorae and tile fragments found at Selinus, dating between the 5th and 3rd century B.C.E., have distinguished two amphorae fabrics: a fine *impasto I* with a natural fine sand temper has been mostly used for Greek amphora types, and a coarser *impasto II* with an additive middle-fine sand temper, mainly found in Punic amphorae (see above, Bechtold ch. 1). Within the framework of the present project and on the basis of the analysis of an admittedly very small set of only 11 samples, we defined three amphorae fabrics SEL-A-1 to SEL-A-3 and the plain ware fabric SEL-C-1. SEL-A-1 seems to be comparable with *impasto I*, while SEL-A-2 and SEL-A-3, both characterised by an additive sand temper, correspond to *impasto II*. The bulk of the samples have been found at Selinus itself and only two samples stem from Entella (M 187/19 and M 187/8). The reference sample of SEL-A-2 (M 154/98) refers to a misfired amphora.

### Transport amphorae (SEL-A-1 to SEL-A-3)

#### FABRIC DESCRIPTION

#### SEL-A-1 (M 187/19) Ref. M 187/19

SEL-A-1 (see above, fig. 2,1) is characterised by a compact, fine-grained matrix with a natural, very fine and dense sand temper. The sizes of the inclusions range from very small to silt fraction, larger inclusions are sporadically present. The pale reddish-brown matrix of M 187/19 is riddled with yellowish-white and white calcium carbonate particles and pseudomorphoses (<0.04–0.28 mm, singularly up to 1.2 mm). Small quartz grains are also very frequent (<0.04–0.12 mm, singularly 0.28 mm, almost all rounded, grey, pale brownish, clear). Red and reddish-brown, mainly rounded particles are common (<0.04–0.08 mm, singularly 0.2 mm), while black particles are infrequent (0.04–0.16 mm, singularly 0.4 and 0.52 mm). Packing of M 187/19 is around 5% (*impasto I*: 5%–15%), porosity around 2.5%.

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<sup>1</sup> Azzaro et al. 2006, 222–3, figs. 1a-b; 226: 'il primo (*impasto I*) ottenuto con l'impiego dell'argilla del Santerniano-Emiliano al natural; il secondo (*impasto II*) verosimilmente prodotto dimagrendo l'argilla pleistocenica con la sabbia medio-fine prelevata dalle dune costiere o dai depositi alluvionali del fiume Modione.'

**SEL-A-2 (M 154/15. 88. 98; M 187/8) Ref. M 154/98**

SEL-A-2 (see above, fig. 2,2) is characterised by a fine to middle-fine and compact matrix with a natural, very fine and dense sand temper. Moreover, we find a high percentage of artificially-added, middle-fine sand. The sizes of the inclusions range from silt fraction to small and medium, sporadically larger particles are present (<0.04–0.4 mm, rarely up to 2.8 mm). The matrix is riddled with mostly rounded quartz grains (<0.04–0.4 mm, infrequently up to 0.8 mm, grey, clear, pale-brownish). Yellowish-white and less frequently white calcium carbonate particles and pseudomorphoses are mainly part of the silt fraction, while larger sized inclusions appear to be infrequent (lime clots, see esp. M 154/88).<sup>2</sup> Red and reddish-brown, mainly very small sized particles are frequent to infrequent (<0.04–0.2 mm, sporadically up to 2.8 mm), while black inclusions are infrequent or sporadically present (<0.04–0.32 mm). Also grog fragments may occur (M 154/98, M 187/8). Packing range is between 25% and 30% (impasto II: 15%–35%) and porosity ranges between 5% and 10%. The clay colour is light red, on the external and/or internal peripheral area often pale brown, or pale brown to greenish-white with pale red core (misfired, see M 154/98).

**SEL-A-3 (M 154/82. 89) Ref. M 154/82**

SEL-A-3 (see above, fig. 2,3) is a variant of SEL-A-2, characterised by a natural and an added sand temper. It differs from SEL-A-2 in a lower packing range (around 15%) and a higher frequency of moderately sorted, large quartz grains (<0.04–0.725 mm, rarely up to 1.0 mm, rounded, grey, clear, white, pale brownish). The clay is riddled with very small, yellowish-white and white calcium carbonate particles (<0.04–0.2 mm, sporadically up to 0.48 mm) and very small pseudomorphoses (0.04–0.12 mm, rarely up to 0.5 mm). Foraminifera and/or bioclastic grains occur sporadically (M 154/82). Very small to large-sized, red and reddish-brown particles are spherically-shaped (<0.04–0.4 mm) to very elongated (0.8– >12.0 mm). Infrequent black particles are rounded to elongated and very small (<0.04–0.28 mm). The clay colour of both samples is light red.

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<sup>2</sup> In particular, small carbonate particles are yellowish-white, larger ones and lime clots are mainly white, for these details see also Azzaro et al. 2006, 223.

## Coarse wares (SEL-C-1)

### FABRIC DESCRIPTION

#### **SEL-C-1 (M 184/1. 2. 9) Ref. M 184/2**

SEL-C-1 (see above, fig. 2,4) is comparable with SEL-A-2, even if added sand grains seem to be finer (<0.04–0.28 mm, sporadically up to 2.2 mm). The compact, fine to middle-fine matrix is riddled with calcium carbonate particles and pseudomorphoses (<0.04–0.28, sporadically up to 0.7 mm, in one case 1.3 mm). Quartz grains are very frequent and appear to be mainly rounded and small-sized (<0.04–0.2 mm, sporadically up to 0.4 mm). Red and reddish-brown particles are also very common (<0.04–0.28 mm, sporadically up 0.4 mm), black particles occur infrequently (<0.04–0.28 mm). M 184/2 shows grog fragments (0.2–1.0 mm, 2.2 mm). The packing ranges between 15% and 17.5%, the porosity is between 5% and 12.5 %. The clay colour varies from pale red and pale brown to grey (when misfired).

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