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## First observations on western Greek amphorae produced at Akragas

### Introduction

The colony of Akragas has been founded by nearby Gela ca. 580 B.C.E. in the central part of Sicily's southern coast, most probably with the additional support of people from Rhodes and Crete. Agrigento counts among the not very numerous western Greek cities expressively mentioned by several ancient authors because of their notable wine yards.<sup>1</sup> Specifically, according to Diodorus (XIII 81,4-5), 5th-century B.C.E. Akragas' profited substantially from the wine trade with Carthage's North African sphere of influence. Notwithstanding the evident, historically prominent role of wine production in this southern Sicilian colony and apart from a couple of earlier archaeometric analyses (see ch. 1), so far, no systematic study has focused on the identification of a local transport amphorae series to be related to this lucrative, supra-regional commercial activity.

Only very recently, several research projects faced the issue of amphorae production in Greek Akragas: first, new excavations in the kiln area located outside Porta V (University of Bologna/Parco Archeologico di Agrigento, see note 7 and ch. 2). Second, the in-depth analyses of the amphorae materials discovered by the excavations in the area South of the temple of Zeus (University of Palermo),<sup>2</sup> in the Roman-Hellenistic quarter/insula III (University of Bologna)<sup>3</sup> and in the Roman sanctuary (University of Catania).<sup>4</sup> Finally, there are the provenance studies on western Greek amphorae mentioned in note \*. As a result of a fruitful and stimulating collaboration between several authorities and researchers and coordinated by the present author, first insights into the scientific outcome of this joined, still on-going study are offered within the frame of this eighth edition of FACEM.<sup>5</sup>

### 1. Archaeometric research

In 2003-2004, a research team guided by G. Barone published first petrographic and chemical data derived from the analyses of a very small selection of western Greek amphorae presumably produced at Akragas. Specifically, four samples referring to "Ionian-Massaliote" (AGR1, AGR6) and "Pseudo-Chian" (AGR7-8) amphorae, unearthed at the western edge of the temple valley and roughly dated to the 6th-5th centuries B.C.E., have been compared to local coarse wares (five samples), tiles (one sample) and pottery found in two medieval kilns (five samples).<sup>6</sup>

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\* Institut für Klassische Archäologie, Universität Wien. The present research has been funded by the Austria Science Fund (FWF: P 30030-G25: "Trade of western Greek amphorae from Himera's perspective"). Special thanks are due to S. Gallagher for his critical input during the correction phase of the English paper. The composition of figs. 1-4 is due F. Ferlito, fig. 5 has been conceived by R. Lampl (both University of Vienna).

1 For this topic in detail, see Van Der Mersch 1996, 168, 175; Brun 2011, 109-10; most recent, see Scalici 2019b, 770.

2 For a preliminary report, see de Cesare and Portale 2016.

3 For a first presentation of 157 diagnostic fragments of amphorae dating from the Archaic to the medieval period, see Scalici 2019a.

4 For a preliminary report, see Calì et al. 2016.

5 Baldoni and Scalici 2020 (local amphorae finds from the kiln area outside Porta V); Amico 2020 (amphorae finds from the area South of the temple of Zeus). The amphorae finds from the Roman sanctuary have been already analyzed by the means of the methods implemented for FACEM and will be published by M. Gerogiannis and the present author within the frame of the final publication of the excavation scheduled for 2021; For the forthcoming, petrographic and chemical analyses, see ch. 1.

6 Barone et al. 2003, 45; Barone et al. 2004 with references to a previous research on misfired samples and coarse wares from the medieval kilns above (Alaimo et al. 1997, 49).

Within the scope of provenance studies of western Greek amphorae from several southern-central Mediterranean sites (see note \*), the archaeometric characterization of the amphorae series of Greek Agrigento ranks among the priorities of the project. For this purpose, our sampling strategy focused foremost on pottery of presumable local fabric found at Agrigento itself: the first selection included five western Greek amphorae and a basin from the kiln area outside Porta V.<sup>7</sup> This small group is completed by western Greek amphorae (N 5), coarse wares (N 11) and tiles (N 3)<sup>8</sup> selected from the stratified contexts excavated in the area at south of the temple of Zeus (see note 2). In order to better define the archaeometric finger print of the local clayey materials, six clay samples have been taken from the outcrops visible at the southeastern slopes of the “Collina dei templi (see note 12)”. Finally, 13 western Greek amphorae found at Selinunte<sup>9</sup> (N 4), Himera<sup>10</sup> (N 7) and Pantelleria<sup>11</sup> (N 2), conjecturally attributed to the production of Agrigento within the project of note \*, have been added to this supposed, local assemblage (tab. 1). All of the 38 samples have undergone petrographic analyses (under the polarizing microscope); furthermore, 19 samples have been submitted for chemical analyses (ICP-MS and ICP/OES). The complete archaeometric characterization of the amphorae -and coarse ware production of Greek Akragas and the clays used by the ancient potters is still on its way, but as a preliminary result, we can reliably consider all of the selected ceramic samples compatible with the local raw materials of the Marnoso Arenacea del Belice/Narbone formations.<sup>12</sup>

## 2. Pottery kilns of Akragas

The systematical investigation of the artisanal areas of Greek Akragas dedicated to the production of ceramic artifacts is the focus of a highly promising, on-going project.<sup>13</sup> First excavations undertaken in the kiln-site outside Porta V have brought to light the structural remains of five kilns.<sup>14</sup> Part of the ceramic finds unearthed in the 2019-excavations, namely from the early-5th century B.C.E. fills of the ovens, has been analyzed within the scope of the research mentioned in note \*.

## 3. Western Greek amphorae produced at Akragas

The on-going provenance study, in according with standardized methods implemented for the database of FACEM<sup>15</sup> and including about 950 6th-4th centuries B.C.E. western Greek amphorae mainly unearthed at several Sicilian sampling sites,<sup>16</sup> has allowed for the identification of ca. 80

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7 Excavations of the University of Bologna and the Parco archeologico di Agrigento under the direction of V. Baldoni and M.C. Parello. For preliminary reports and first pottery finds, see Baldoni et al. 2019; Scalici 2019c, both with earlier references; most recent: Baldoni and Scalici 2020. Two of the amphorae fragments (and in addition to these a spacer and a bowl) are illustrated in Baldoni et al. 2019, 111-15, figs. 9,3, 11,7, 12,1-2.

8 The pottery finds have been selected by A.L. Amico who will present the whole assemblage within the frame of the final publication of the excavations. A first selection of 14 amphorae, recorded according to the standardized methods implemented for the database of FACEM, is discussed in Amico 2020.

9 Excavations in the mayor urban sanctuary on the acropolis (temples B and R, since 2006) by the New York University (IFA) and the University of Milano under the direction of C. Marconi.

10 Excavations in the eastern and western necropoleis of Himera (1990-2011) conducted by the Soprintendenza BB.CC.AA. of Palermo under the direction of S. Vassallo.

11 Acropolis excavations at Cossyra (since 2000) by the University of Tübingen under the direction of Th. Schäfer.

12 Montana et al. 2011. The archaeometric research is in progress, conducted by G. Montana (DiSTem, University of Palermo) and L. Randazzo (DiBEST, Università della Calabria) to whom I am very grateful for the permission to anticipate some of their forthcoming results.

13 Most recent, see Baldoni et al. 2019, 107-9, figs. 1-3.

14 For an in-depth discussion, see Scalici 2019c.

15 See <http://facem.at/project/about.php#photography>.

16 For an overview of these sampling sites, see Bechtold 2020c, fig. 1. For the project, see note \*.

fragments hypothetically attributed to the production of Akragas. A total of 21 samples from this group have been submitted for archaeometric analyses (see ch. 1) and attributed to one single archaeological fabric labeled AKR-A-1.<sup>17</sup> By comparison with this selection, a second group of 60 more amphorae fragments found mostly at Agrigento itself (N 42, see notes 2-5), but also at Selinunte (N 2, see note 9), Himera (N 5, see note 10), Pantelleria (N 6, see note 11), Segesta<sup>18</sup> (N 4), Malta<sup>19</sup> (N 1) and Monte Turcisi (Catania)<sup>20</sup> (N 1) has been referred to the same fabric. This ample corpus of about 80 fragments allows for first observations on the chrono-typological development of western Greek amphorae produced at Akragas (tab. 1).

| Site of discovery                   | FACEM inv.     | Site inv.         | Type              | Fabric FACEM | Archaeometry           | Published  | Fig.  |
|-------------------------------------|----------------|-------------------|-------------------|--------------|------------------------|--|-------|
| Segesta, Grotta Vanella dump        | 165/81         | SG 16079A         | <i>Randform 3</i> | AKR-A-1      |                        | de Cesare et al. 2020, fig. 4,7                            | 1,1   |
| Agrigento, kiln area Porta V        | <b>208/43</b>  | QAV19.1.55        | <i>Randform 3</i> | AKR-A-1      | Petrography            | Baldoni et al. 2019, 115, fig. 12,1                        | 1,2   |
| Agrigento, kiln area Porta V        | <b>208/47</b>  | QAV19.15.7        | Form 2?           | AKR-A-1      | Petrography            | Baldoni et al. 2019, 115, fig. 12,1                        | 1,3   |
| Himera, western necropolis          | <b>179/232</b> | W5377             | Form 2            | AKR-A-1      | Petrography, chemistry | Bechtold 2020c, fig. 3,2                                   | 1,4   |
| Himera, western necropolis          | <b>179/168</b> | W4716             | Form 2            | AKR-A-1      | Petrography, chemistry |  | 1,5-6 |
| Himera, western necropolis          | 179/449        | W2458             | Form 2            | AKR-A-1      |                        | Bechtold 2020c, fig. 3,1                                   | 1,7-8 |
| Himera, eastern necropolis          | 179/324        | RO1685            | Form 2            | AKR-A-1      | Petrography, chemistry |  | 1,9   |
| Agrigento, kiln area Porta V        | <b>208/44</b>  | QAV19.1.62        | <i>Randform 3</i> | AKR-A-1      | Petrography            |  | 2,1   |
| Pantelleria, forum area (V/XVI)     | <b>119/270</b> | PN17 7025-1       | <i>Randform 3</i> | AKR-A-1      | Petrography            |  | 2,2   |
| Himera, western necropolis          | <b>179/332</b> | W3047             | Form 3            | AKR-A-1      | Petrography, chemistry | Bechtold 2020c, fig. 3,3                                   | 2,3-4 |
| Himera, western necropolis          | 179/224        | W4403             | Form 2            | AKR-A-1      | Petrography, chemistry |  | 3,1   |
| Himera, eastern necropolis          | 179/287        | RO1339            | Form 3            | AKR-A-1      | Petrography            | Bechtold 2020c, fig. 3,4                                   | 3,2   |
| Himera, western necropolis          | 179/220        | W208              | Hybrid type       | AKR-A-1      |                        |  | 3,3   |
| Himera, western necropolis          | 179/233        | W6194             | <i>Randform 6</i> | AKR-A-1      | Petrography, chemistry |  | 3,4-5 |
| Agrigento, area S of temple of Zeus | 208/1          | US 337,1          | <i>Randform 7</i> | AKR-A-1      | Petrography, chemistry | Amico 2020, cat. 5   | 4,1   |
| Agrigento, area S of temple of Zeus | 208/3          | US 183,1          | <i>Randform 7</i> | AKR-A-1      | Petrography, chemistry | Amico 2020, cat. 7   | 4,2   |
| Pantelleria, acropolian sanctuary   | 119/174        | PN06 ACR I 2079-3 | <i>Randform 7</i> | AKR-A-1      | Petrography, chemistry | Bechtold 2015, cat. 12, pl. 1,12; Bechtold 2020c, fig. 3,5 | 4,3   |

17 For this fabric, see in detail Ferlito 2020.

18 Published in de Cesare et al. 2020, 355-56, tab. 1, fig. 4,7-9, 359-60, tab. 2, fig. 5,9.

19 Excavations at Rabat, Gherixem Road (GHX2013), by the Superintendence of Cultural Heritage of Malta under the direction of N. Cutajar to whom I am very grateful for the study and sampling permission of selected amphorae finds.

20 Excavations by the German Archaeological Institute under the direction of M. Jonasch: peg fragment of a late archaic amphora (M 205/35 = MT 112) which will be published by F. Ferlito.

| Site of discovery                   | FACEM inv. | Site inv.                  | Type               | Fabric FACEM | Archaeometry           | Published                | Fig. |
|-------------------------------------|------------|----------------------------|--------------------|--------------|------------------------|--------------------------|------|
| Agrigento, area S of temple of Zeus | 208/2      | US 337,2                   | <i>Randform 7</i>  | AKR-A-1      | Petrography, chemistry | Amico 2020, cat. 6       | 4,4  |
| Pantelleria, acropolian sanctuary   | 119/268    | PN03 ACR I 1447-36         |                    | AKR-A-1      |                        |                          | 4,5  |
| Selinunte, acropolian sanctuary     | 154/123    | TR saggio O US 13 P12.179  | <i>Randform 7</i>  | AKR-A-1      | Petrography            | Bechtold 2020c, fig. 3,7 | 4,6  |
| Pantelleria, acropolian sanctuary   | 119/264    | PN06 ACR I 2095-20         | <i>Randform 7?</i> | AKR-A-1      |                        |                          | 4,7  |
| Agrigento, area S of temple of Zeus | 208/14     | US 240,3                   | <i>Randform 7?</i> | AKR-A-1      |                        | Amico 2020, cat. 12      | 4,8  |
| Selinunte, acropolian sanctuary     | 154/152    | TR saggio P US 118 P13.122 | Echinus rim        | AKR-A-1      | Petrography            |                          | 4,9  |

**Tab. 1. Synopsis of data related to illustrated, western Greek amphorae produced at Agrigento. Items indicated in bold are published in the database of FACEM.**

At present, the earliest fragments of local production can be classified as Gassner's<sup>21</sup> *Randform 3*, characterized by rather thick (2-2.5 cm max.), semi-ovoid rims (h 3-3.5 cm) with a maximum diameter in the middle part, often provided by an ample air chamber and strongly profiled at their inferior edges (fig. 1,1-2). While the fragments excavated in the kiln area show rim diameters of about 16, or – more rarely – 14 cm,<sup>22</sup> other items from Himera, Pantelleria and Agrigento itself have smaller diameters of about 11-13 cm. Among our assemblage, the type is best attested by at least 18 items and quite precisely dated by both archaeological contexts excavated at Agrigento<sup>23</sup> and further morphological comparisons<sup>24</sup> to the end of the 6th-beginning of the 5th century B.C.E.

Most probably as a variant of this main shape, we find a few rims with *Randform 2*<sup>25</sup> which misses the modulation of the lower edge of the rim. An amphora of this shape (fig. 1,7-8) has been yielded in an enchytrismos burial in the western necropolis of Himera, where it was associated with a late archaic, black figure lekythos. Its rim profile finds a nice comparison in an amphora unearthed at Agrigento in the foundation trench of Porta VII, dated to the late 6th-early 5th century B.C.E.<sup>26</sup>

21 Gassner 2003, 180-81, fig. 91.

22 Baldoni et al. 2019, 113.

23 The most reliable chronological indication is provided by the recent excavations in the kiln area outside Porta V where this shape clearly dominates among the amphorae fragments of local fabric. The abandonment of the hitherto unearthed productive structures is preliminarily dated to the second quarter of the 5th century B.C.E.: Baldoni et al. 2019, 113-15, fig. 12,1; Scalici 2019c; Baldoni and Scalici 2020. Furthermore, two fragments (M 208/6.9) of this type have been yielded by a stratified deposit (US 191) excavated in the area to the south of the temple of Zeus and preliminarily assigned to late-6th or early 5th century B.C.E.: Amico 2020, cat. 1-2.

24 From the fortifications of Agrigento/Porta VII: Fiorentini 2010, saggio 2/06, area 2, US 74 (accumulation layer), pl. LIII, cat. 193 (Ag P 103) associated with a second half of the 6th-century B.C.E. Corinthian A-amphora of Sourisseau's form 4.

25 Gassner 2003, 180-81, fig. 91.

26 Fiorentini 2010, 111, pl. LV, cat. 185 (Ag P 111) from US 151.

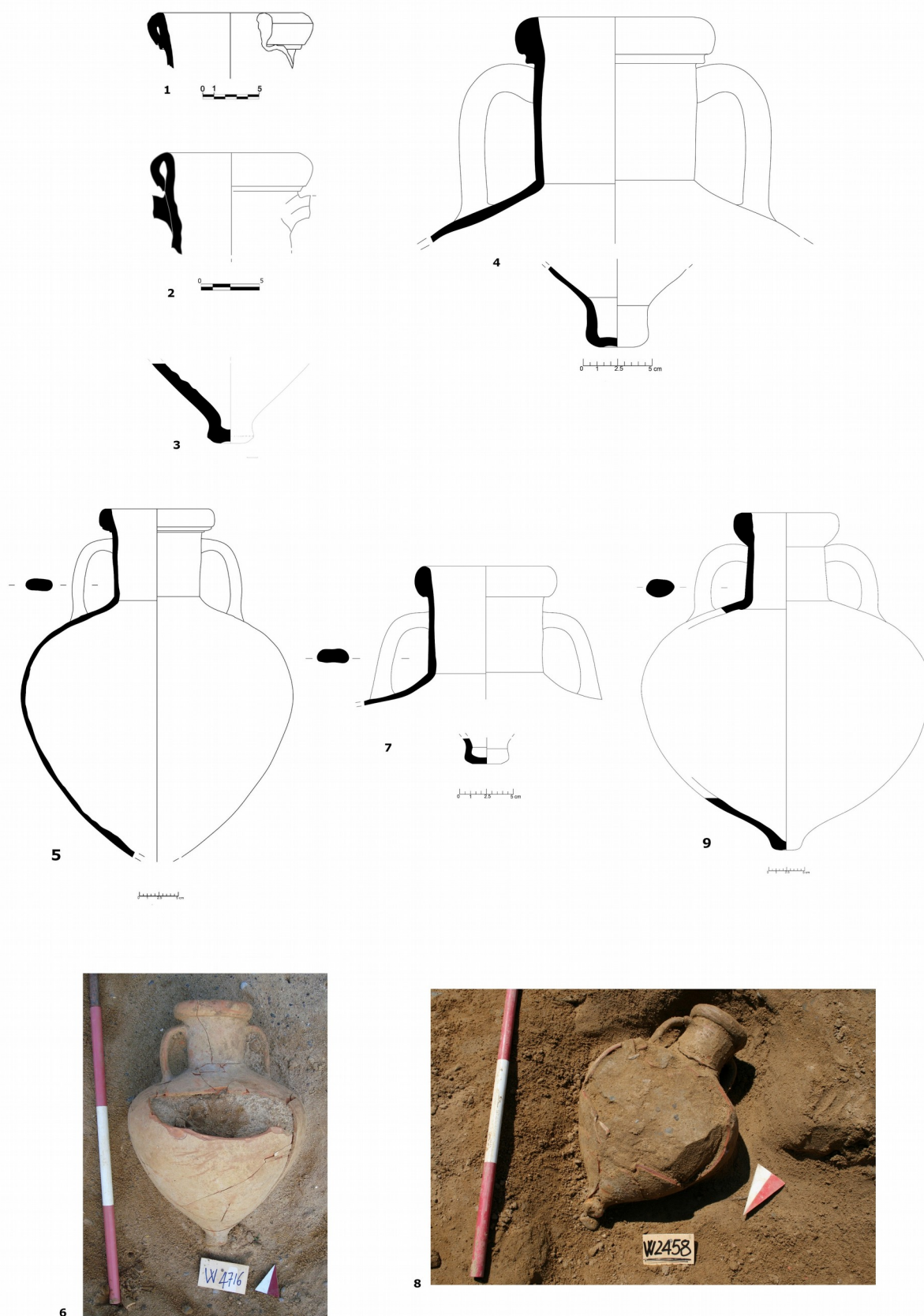


Fig. 1. Late archaic western Greek amphorae produced at Akragas. *Randform 3* (massive variant): 1. M 165/81 2. M 208/43 Peg: 3. M 208/47 Form 2 with *Randform 3* (massive variant): 4. M 179/232 5-6. M 179/168 Form 2 with *Randform 2*: 7-8. M 179/449 9. M 179/324.

This latter item, as well as three well preserved vessels with *Randformen* 2 (fig. 1,9) and 3 (fig. 1,4-6) all match Sourisseau's form 2,<sup>27</sup> characterized by short (7-8 cm), straight necks, vertical strap-handles and sub-globular bodies with a maximum diameter in the central part of the vessel. Pegs appear to be internally hollow and of cylindrical shape with a maximum diameter of 4-4.5 cm and a flat or slightly concave resting surface. In particular, several fragments of this type yielded by the kiln-contexts excavated outside Porta V<sup>28</sup> show characteristic angular, almost bi-conical, external profiles (fig. 1,3).

Highly interestingly, the late archaic shape described above produced in the artisanal area outside Porta V shows evident, morphological similarities with the earliest items of the recently defined form "Gela I" dated to the late 6th century B.C.E. which currently represents the archetype of the Geloan series.<sup>29</sup> From a typological point of view, the earliest amphorae produced at Agrigento also find close comparisons among the major group of western Greek amphorae produced in eastern Calabria and yielded by the well-dated shipwreck of Cala Sant Vicenç (520-510/500 B.C.E.).<sup>30</sup>

Three nearly complete form 2 vessels found at Himera provide us with first metrical indications for late archaic amphorae produced at Akragas of a height of 45-48 cm (tab. 2,1-3) which corresponds *exactly* to the measurements indicated by Grazia Spagnolo for the medium-sized vessels of form "Gela I".<sup>31</sup>

| Inventories        | Type                        | Height       | Max. diam.  | Ratio H:max. diam | Volume <sup>32</sup> | Dat. amphora   | Fig. |
|--------------------|-----------------------------|--------------|-------------|-------------------|----------------------|----------------|------|
| W2458 / M 179/449  | <i>Randform 2 / form 2</i>  | ca. 48 cm    | ca. 31.5 cm | 1.5               |                      | 520-500 B.C.E. | 1,7  |
| RO1685 / M 179/324 | <i>Randform 2 / form 2</i>  | 47.8 cm      | 41.3 cm     | 1.16              | 24.4 liters          | 510-480 B.C.E. | 1,9  |
| W4716 / M 179/168  | <i>Randform 3 / form 2</i>  | 45 cm        | 35 cm       | 1.28              | 18.2 liters          | 500-480 B.C.E. | 1,5  |
| W3047 / M 179/332  | <i>Randform 3 / form 3</i>  | ca. 60 cm    | 44 cm       | 1.36              |                      | 480-460 B.C.E. | 2,3  |
| W4403 / M 179/224  | <i>Randform 4? / form 2</i> | ca. 54 cm    | ca. 47 cm   | ca. 1.15          |                      | 480-450 B.C.E. | 3,1  |
| RO1339 / M 179/287 | Form 3                      | ca. 53-54 cm | ca. 35 cm   | ca. 1.5           |                      | 470-450 B.C.E. | 3,2  |
| W208 / M 179/220   | Hybrid type                 | 59.9 cm      | 36.5 cm     | 1.64              | 23.7 liters          | 470-450 B.C.E. | 3,3  |
| W6194 / M 179/233  | <i>Randform 6</i>           | ca. 75 cm    | ca. 47 cm   | 1.6               |                      | 450-420 B.C.E. | 3,4  |

**Tab. 2. Measurements of western Greek amphorae produced at Akragas and found in the necropoleis of Himera. Inventories report the local and the FACEM codes. Types refer to Gassner 2003 and Sourisseau 2011.**

At Agrigento, a second group is composed of more elongated rims of *Randform 3*, in general higher than 4 cm and thinner than 2 cm (fig. 2,1-2). Among the corpus of fragments studied within the present research, elongated rims are attested by at least 16 items. Highly significantly, in the kiln contexts excavated outside Porta V in use *before* the second quarter of the 5th century B.C.E., this shape appears to be clearly outnumbered by the more massive rims (fig. 1,1-2.4-6). Accordingly,

27 Sourisseau 2011, 176, fig. 6; 190 on the basis of the dating of several archaeological closed contexts, the *morphological* form 2 is dated from 540/530-490/480 B.C.E. For first hypothesis on its production also at Agrigento see pp. 209-210.

28 Published in: Baldoni et al. 2019, 115, fig. 12,1; Baldoni and Scalici 2020, tab. 1, fig. 12, 15.7 = M 208/47.

29 Spagnolo 2018, 284-86, fig. 3, especially nn. 2-5, 7-9.

30 Santos 2008, 132-40, figs. 123-129, all of fabric CAL-A-8.

31 Spagnolo 2018, 291 with rim diameters of 10.5-11 cm and peg diameters of 4.5-5 cm.

32 For the volumetric calculation I used a method available open source: <http://automeris.io/WebPlotDigitizer/> (by A. Rohatgi).

M. Scalici suggests elongated rims constitute the early-classical evolution of the thicker, late archaic type.<sup>33</sup> Morphological comparisons for elongated rims can be found at Agrigento itself,<sup>34</sup> at Gela<sup>35</sup> and in the destruction layer of the shrine of Colle Madore abandoned after ca. 480 B.C.E.<sup>36</sup>

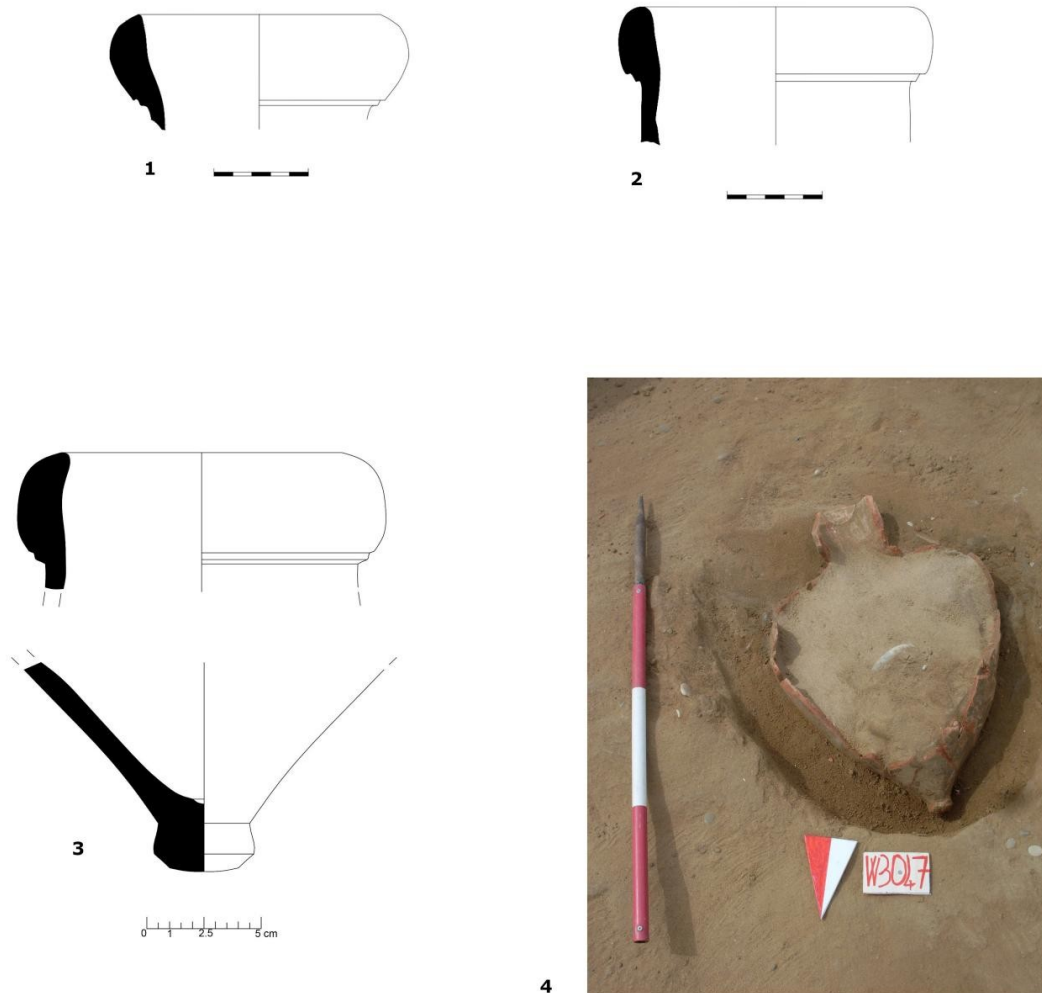


Fig. 2. Early 5th-century B.C.E. western Greek amphorae produced at Akragas. *Randform 3* (elongated variant): 1. M 208/44 2. M 119/270 Form 3 with *Randform 3* (elongated variant): 3-4. M 179/332.

A well preserved amphora of this latter rim type found at Himera, characterized by a heart-shaped body with a maximum diameter at the shoulder (fig. 2,3-4), matches Sourisseau's form 3.<sup>37</sup> The ratio of this evolution stage of the local series might be slightly higher than the one of the late archaic form 2 amphorae (tab. 2,2-4). However, M 179/332 shows a massive, bi-conical peg clearly different from the knob-shaped, internally hollow toe fragment unearthed in the kiln area of Agrigento which has been hypothetically associated with the group of elongated rims.<sup>38</sup> Due to the

33 Baldoni et al. 2019, 114-15, fig. 12,2.

34 De Miro 2003, 315, fig. 68,195 "portico Nord-est, ambiente 1 a Nord di MR 6" and five more fragments of this shape from other deposits excavated in the area of the Asklepieion.

35 Spagnolo 2018, 284, fig. 3,1.

36 Polizzi 1999, 222, fig. 221, cat. 403-404, context dated to the late 6th or early 5th-century B.C.E.

37 Sourisseau 2011, 176, fig. 6; 191, on the basis of the dating of two ship wrecks and some funerary contexts, the *morphological* form 3 is dated from 490/80-460/50 B.C.E.

38 Baldoni et al. 2019, 114-15. It has to be stressed, however, that the reconstruction of the vessel illustrated in fig.

still very limited pool of material at our disposal, for the moment we should refrain from the temptation to propose a chronological serialization within the local, early classical-period series.

In conclusion, the evidences from the artisanal area located outside Porta V of Agrigento, in combination with the new data emerging from the necropoleis of Himera, confirm a dating range of 520/510-500/490 B.C.E. for an earlier group of sub-globular, form 2 amphorae of 45-48 cm in height, distinguished by massive rims of *Randform* 3 and square, cylindrical pegs (fig. 1, tab. 2,1-3). This shape is followed – with a probable overlap during the early 5th century B.C.E. – by higher, perhaps heart-shaped form 3 vessels with more elongated rims which seem typical for the local production of the second/third decade of the century (fig. 2, tab. 2,4). Highly interestingly, a very similar evolution from massive to more elongated, semi-ovoid rims of form 2 vessels *before* ca. 480 B.C.E. has also been recently noted for the western Greek amphorae series produced by the Dorian-Chalcidian colony of Himera on Sicily's northwestern coast.<sup>39</sup>

The morphological development of the amphorae manufactured at Akragas during the central decades of the 5th century B.C.E. is still very far from being clear. Three well preserved amphorae unearthed in the necropoleis of Himera and attributed to fabric AKR-A-1 show thickened, rather square rims of about 3.5 cm height with a light modulation of their inferior edges. The most distinctive element of this small selection is represented by a slightly convex, cylindrical neck of 10-12 cm in height, though which appears to be definitively longer than the necks of late archaic-early classical series shown above (figs. 1-2). Furthermore, the three amphorae illustrated in fig. 3 appear to be clearly taller (54-60 cm, see tab. 2,5-7) than the late-archaic form 2 vessels (tab. 2,1-3).

The sub-globular body of W4403 (fig. 3,1) is comparable to the late archaic vessel RO1685 (fig. 1,9), while its massive peg resembles the one of early-classical W3047 (fig. 2,3). A possible parallel for the rim-neck portion of W4403 comes from Gela from a third-quarter of the 5th century B.C.E. context.<sup>40</sup> RO1339 (fig. 3,2) shows a heart-shaped profile similar to W3047 (fig. 2,4) and can be compared to the latest variant of Sourisseau's form 3, dated around 460/450 B.C.E.<sup>41</sup> By contrast, W208 (fig. 3,3), distinguished by a sub-ovoid body with a clearly higher ratio than the previous group (tab. 2) and associated with a cylindrical peg, resembles vaguely the latest shape "Gela I" amphorae from third-quarter of the 5th century B.C.E. contexts.<sup>42</sup> It has been associated with a black glaze juglet by Stefano Vassallo preliminarily dated to around the mid-5th century B.C.E.

A strong argument for the dating of the group above to the second third of the 5th century B.C.E. is consistent in the absence of comparable rims and pegs among the kiln contexts of Porta V with a terminus ante quem of ca. 480/470 B.C.E. Furthermore, general, morphological tendencies of the development of western Greek amphorae definitively suggest a later chronology for more elongated vessels, characterized by with longer and slightly convex necks and a higher ratio between height and maximal diameter.<sup>43</sup>

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12,2 has a ratio of ca. 1.8, which is notably higher than the average value calculated for the form 2-3-amphorae listed in tab. 1 and even higher than the one of the second-half of the 5th century B.C.E. amphora with *Randform* 6. In fact, M. Scalici himself underlines in note 21 that pegs very similar to the one of his fig. 12,2 find comparisons, for instance, among the late-5th century B.C.E. amphorae production of Himera. Finally, in this regard we also have to remember that in nearby Gela knob-shaped, hollow toes appear in contexts to be dated *not earlier* than the third quarter of the 5th century B.C.E. where they are associated with amphorae of an advanced stage of form "Gela I": Spagnolo 2018, 287-89, fig. 4,8.

39 Bechtold et al. 2019, 7-8, figs. 4 (massive variant) and 5 (elongated variant).

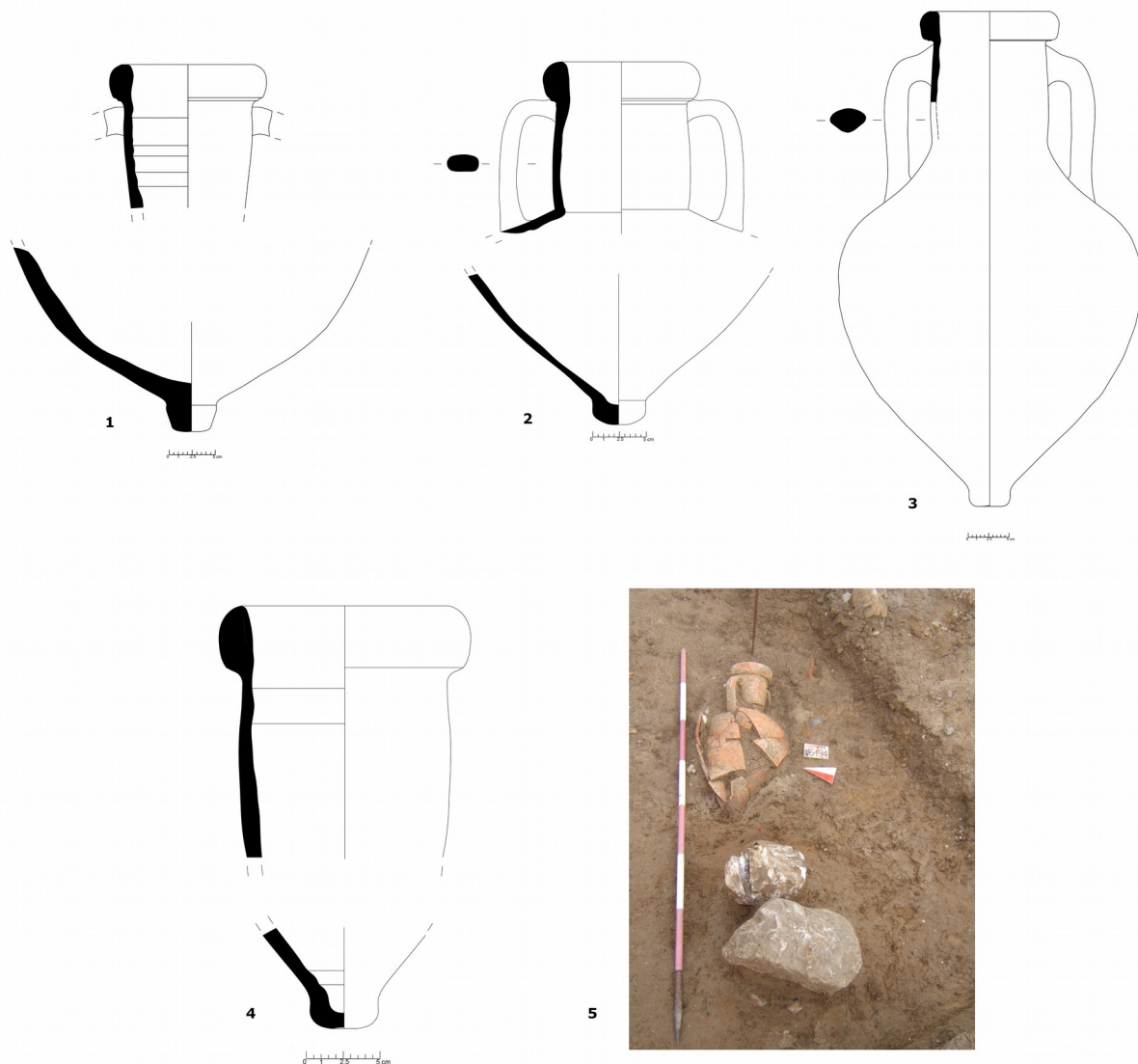
40 Spagnolo 2018, 287-89, fig. 4,2.

41 Sourisseau 2011, 176, fig. 6, 191, note 160 (from the necropolis of Fratte).

42 Spagnolo 2018, 287-89, fig. 4,5.8.

43 For a very useful synopsis, by tendency confirmed also by the on-going research mentioned in note \*, see Sourisseau 2011, 176, fig. 6.





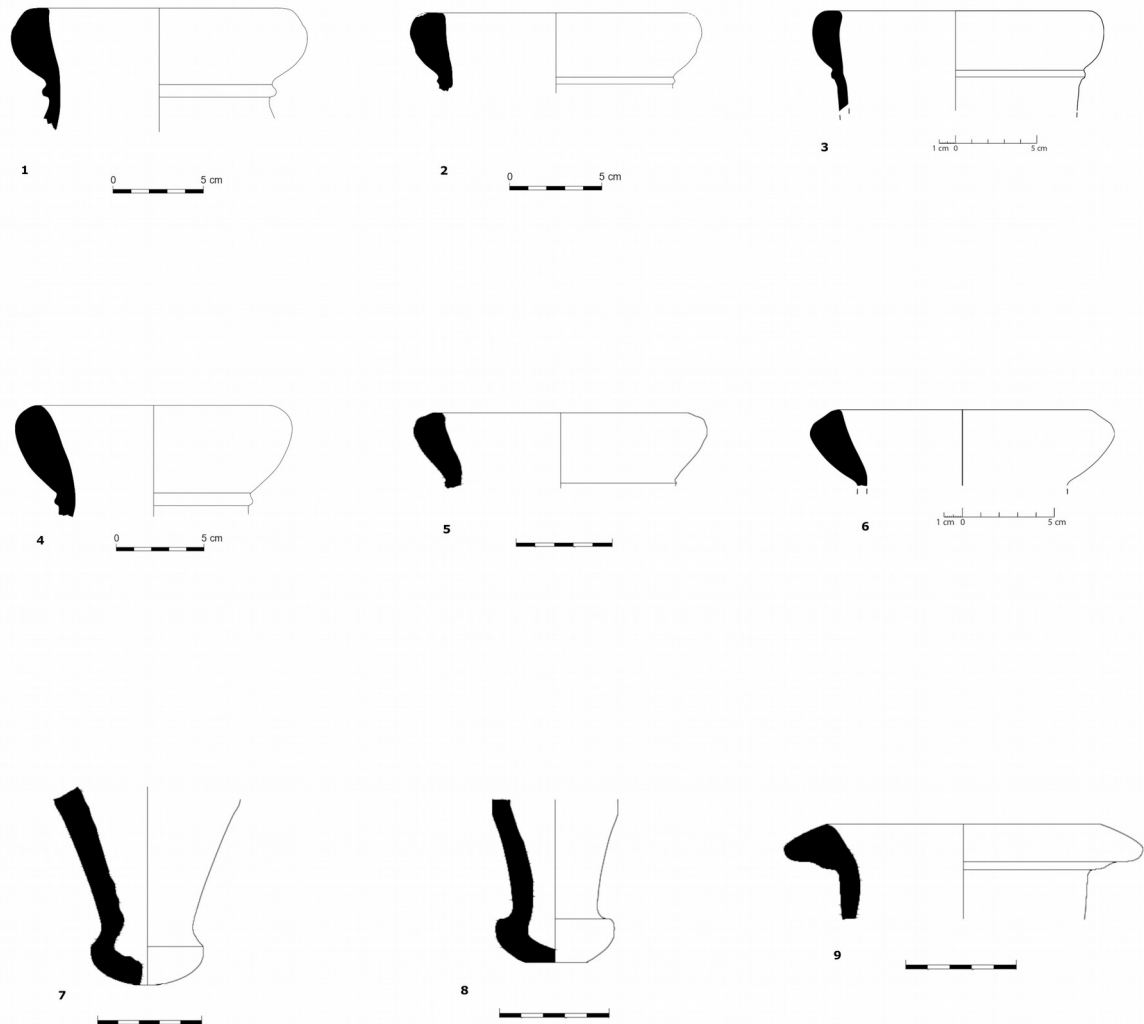
**Fig. 3. 5th-century B.C.E. western Greek amphorae produced at Akragas. 1. M 179/224 2. M 179/287 3. M 179/220 4-5. M 179/233.**

One amphora with almond-shaped *Randform* 6 and elongated, slightly convex neck, sub-ovoid body and short, cylindrical peg (fig. 3,4-5) finds close morphological comparisons among late 5th-early 4th century B.C.E. vessels.<sup>44</sup> So far, this item represents a typological outlier among the local series<sup>45</sup>, imitating South Calabrian prototypes documented, for instance, in the excavations in the

44 For Messina, see Bacci and Tigano 1999, 97, fig. 15,117 dated to the last quarter of the 5th century B.C.E. (production of Locri); for Gela, see Spagnolo 2014, 433-35, fig. 17a from an early-4th century B.C.E. cistern fill containing materials of the later 5th century B.C.E. (production of Locri with more convex neck); for Segesta, see Bechtold 1995, 1104, 4), pl. CCXXI,14 from a frequentation level dated 410-350 B.C.E. (probable South Calabrian production).

45 Highly remarkable appears however the documentation of a *Randform* 6 rim attributed to the production of Akragas among the amphorae finds from Hipponion in western Calabria (not indicated in the distribution map of fig 5) discussed by P. Vivacqua within the frame of the present edition of FACEM, see Vivacqua 2020, 9, tab. 2, 21 M 265/5.

area south of the temple of Zeus<sup>46</sup> and in insula III.<sup>47</sup> Remarkably, one rim fragment close to *Randform* 6 has also been identified among the local, late classical production of Selinunte.<sup>48</sup> Moreover and on the basis of macroscopic analysis, a *Randform* 6 rim found at Mégara Hyblaea has been attributed more generally to southeastern Sicily.<sup>49</sup>



**Fig. 4. Later 5th-4th century B.C.E. western Greek amphorae produced at Akragas. *Randform* 7 (vertical version): 1. M 208/1 2. M 208/3 3. M 119/174 *Randform* 7 (out-sloping version): 4. M 208/2 5. M 119/268 6. M 154/123 Pegs: 7. M 119/264 8. M 208/14 Echinus rim: 9. M 154/152.**

Towards the later 5th-first half of the 4th-century B.C.E. we find the next homogeneous morphological group, composed of four almost vertical, semi-ovoid rims of about 3.5 cm height, underlined by a marked ridge. The internal profile appears to be slightly concave and the maximum diameter can be found in the upper half (fig. 4,1-3). None of the fragments analyzed within the frame of the present research preserves entire portions of the body. One rim (fig. 4,3) shows the beginning of a conical (?), rectilinear neck, while a second item (fig. 4,1) preserves the initial part of

46 Amico 2020, 3 cat. 3-4, tav. I.

47 Scalici 2019a, 247, fig. 1,16.

48 Bechtold 2020b, 2-3, fig. 3,5.

49 Sourisseau 2018, 20, fig. 43 cat. 65.

a convex-shaped neck.

Unfortunately, the archaeological contexts of discovery do not allow for a precise dating of this group: three rims with definitively thickened profile have been yielded from late 5th-4th century B.C.E. levels excavated at Agrigento itself, in the area at to the south of the temple of Zeus (fig. 4,1-2).<sup>50</sup> The thinner fragment (fig. 4,3), as well as two internally cave, knob-shaped pegs with rounded resting surface (fig. 4,7),<sup>51</sup> presumably to be associated with the type under focus, have been found as residuals in mid-3rd century B.C.E. deposits related to the foundation of building I.3 on the acropolis of Pantelleria.

From a typological point of view, the selection above can be attributed to Gassner's late-classical *Randform 7*<sup>52</sup> combined with *Fußform 3*,<sup>53</sup> particularly characteristic of southern Campanian series. Recent and on-going research in Sicily has given evidence, however, for the widespread, regional production of amphorae with thickened rims underlined by a ridge during the advanced 5th and part of the 4th century B.C.E.<sup>54</sup> The closest comparisons for the small selection manufactured at Akragas can be found among the local series of Selinunte, where similar rim profiles should be probably dated to the last decades of life of the colony before the Carthaginian destruction in 409 B.C.E.<sup>55</sup> To the last quarter of the 5th century B.C.E. has also been attributed shape "Gela II", by tendency very similar to the group from Agrigento, but distinguished by slightly out-sloping rims with thinned, upper edge.<sup>56</sup> Furthermore, the item illustrated in fig. 4,3 finds good parallels among the local amphorae series of Himera to be dated in between ca. 425/20-409 B.C.E.,<sup>57</sup> while the more thickened fragments (fig. 4,1-2) can be compared to a *Randform 7* rim produced in the Punic emporia of Palermo or Solunto.<sup>58</sup> By contrast, more different appear the late 5th-4th centuries B.C.E. amphorae produced at Entella characterized by more inclined and very elongated rims.<sup>59</sup>

A second selection of four slightly higher (about 4 cm) and more out-sloping rims might stand for a somewhat later evolution of the local *Randform 7* type. However, at present no clear stratigraphic data are available.<sup>60</sup> The fragment illustrated in fig. 4,4 finds a close comparison at Agrigento itself, in the northeastern porticus of the Asklepieion,<sup>61</sup> while two fragments with thinned, upper edge (fig. 4,5-6) remember the late 5th-century B.C.E. "Gela II" shape,<sup>62</sup> several local amphorae from the Strait of Messina area,<sup>63</sup> a vessel from the cargo of the Porticello shipwreck,<sup>64</sup> and one fragment found at Ramacca (Catania).<sup>65</sup> Finally, from a mid/second half of the 4th

50 Amico 2020, 3 cat. 5.7, tav. II.

51 For a published fragment, see Bechtold 2015, 335, cat. 15, pl. 1,15.

52 Gassner 2003, 181-82, fig. 91, 213, tab. 22.

53 Gassner 2003, 117-18, fig. 52,3, 199-200, figs. 100,d, 101.

54 For a first overview: Bechtold et al. 2019, 14; for Mégara Hyblaea, see very recently Sourisseau 2018, 30, fig. 43, cat. 56-59.68 here attributed more generally to production centers located in southeastern Sicily.

55 Bechtold 2020b, 2-3, fig. 1,1-3.

56 Spagnolo 2018, 288-90, fig. 5. At Gela, amphora production ceases after the Carthaginian destruction of the city in 405 B.C.E.

57 Bechtold et al. 2019, 9, especially fig. 6,2.

58 Bechtold 2020c, fig. 4,5.

59 Corretti et al. 2017, 79-85, 213, fig. 61.

60 Three fragments (fig. 4,6-7 and a still unpublished item from Malta/Rabat, see note 19) are certainly residuals in later contexts, while the last one (fig. 4,4) stems from a late 5th-4th century B.C.E. level excavated in the area just south of the temple of Zeus, which has also yielded one item with a vertical, thickened rim (fig. 4,2). See also Amico 2020, cat. 6-7.

61 De Miro 2003, 154, 315, fig. 68,193.

62 Spagnolo 2018, 288-89, fig. 5,1-3.

63 Bacci and Tigano 2001, 29, fig. 10,17-18.

64 Eiseman and Ridgeway 1987, 49-50, fig. 4-14, C29.

65 Albanese Procetti 2003, 42, pl. III,4 "Sicilian production?".

century B.C.E. level excavated in the area south of the temple of Zeus stems a knob-shaped peg with flat bottom (fig. 4,8)<sup>66</sup> which might constitute an advanced stage of the toes with convex bottom (fig. 4,7). At present, the group of *Randform 7* amphorae above represents the latest evolution within the class of western Greek amphorae produced at Agrigento and can be placed for both stratigraphical and morphological reasons within the last quarter of the 5th and the first half or the first two thirds of the 4th centuries B.C.E.

Notwithstanding, we have to point to one echinus-shaped rim (fig. 4,9) on the basis of petrographic analyses compatible with the MAB/Narbone formation raw materials which characterize the pottery productions of Agrigento as well as of Selinunte (see note 12). The fragment has been yielded in the Hellenistic fill (320-290 B.C.E.) of the adyton of temple R on the acropolis of Selinunte which contained, however, five later 5th-4th centuries B.C.E. amphorae fragments. Under the stereo-microscope the present item strongly resembles the local fabric AKR-A-1, but to date we cannot completely rule out its manufacture at Selinunte. Good morphological comparisons can be found among presumable local or regional productions attested at Entella where the type is well documented in the early Hellenistic collapse-levels of the “granaio” in area 3000.<sup>67</sup>

Finally, we have to underline the remarkable, present absence, among the approximately 80 fragments of late 4th-2nd centuries B.C.E. Graeco-Italic amphorae (Gassner’s *Randformen 8-14*<sup>68</sup>) unearthed in several recent excavations at Agrigento,<sup>69</sup> of items of presumed local production.

#### 4. Preliminary observations on Akragas’ production of western Greek amphorae

The typo-chronological study above has provided solid evidence for a late archaic-early classical series, to be dated between 520/510-480/470 B.C.E. (figs. 1-2). From a morphological standpoint, Akragas participates in a regional amphora koiné<sup>70</sup> most probably inspired by Calabrian second-half-of-the-6th-century B.C.E. prototypes<sup>71</sup> which count among the earliest western Greek amphorae imported to archaic Sicily.<sup>72</sup> To date, the beginning of amphora production at Agrigento coincides chronologically probably with the use of the artisanal area discovered outside Porta V. Inside the colony, late archaic form 2 (and 3?) vessels with *Randform 3* are currently well documented, being attested in the area south of the temple of Zeus, in the urban area (insula III), in the levels underlying the Roman sanctuary, at the fortifications (Porta VII) and in the area of the Asklepieion.

66 See also Amico 2020, 4 cat. 12, Tav. III.

67 Corretti and Capelli 2003, 296-97, pl. LV,28-34.

68 For this recent classification, see Gassner et al. 2014, 244-47.

69 Sampling and provenance studies according to the standardized methods of the database of FACEM (see above, note 15) conducted by the present author in collaboration with the colleagues mentioned in note 5, the Universities of Catania, Palermo and Bologna and the Parco Archeologico di Agrigento.

70 The proliferation of amphorae workshops across western Sicily during the late archaic period can be more generally related to an increase of wealth and population, see specifically Vassallo 2000, 994; Vassallo 2020, 4-5.

71 Bechtold et al. 2019, 13; Bechtold 2020c, ch. 3.

72 Even if provenance studies on 6th-centuries B.C.E. amphorae from Sicilian sites admittedly are only at an initial stage, it is already possible to highlight the preeminence of vessels imported from southern and eastern Calabria (probably from the areas of Rhegion and Sybaris): for Gela, see Finocchiaro et al. 2018, 185-86, five samples attributed to Sybaris; at Agrigento, one still unpublished fragment analysed within the frame of the project mentioned in note \*, identified in the excavations at the kiln site of Porta V (QAV, see note 7) and currently studied by M. Scalici, has been attributed to the area of Sybaris (M 208/68); for the hinterland of Agrigento (site of Sanfilippo), see Giuliano 2020, 9, fig. 7, M 263/2.6 (Sybaris) and M 263/4 (Rhegion); for Segesta, see de Cesare et al. 2020, 355-61, tab. 1, figs. 3,1-2, at least two items from Grotta Vanella attributed to Sybaris and Rhegion; tab. 2, fig. 5,1 from the sanctuary in contrada Mango attributed to Rhegion; for first observations on the dominance of Calabrian amphorae in archaic Himera, see Bechtold 2020c, ch. 3, tab. 5a.

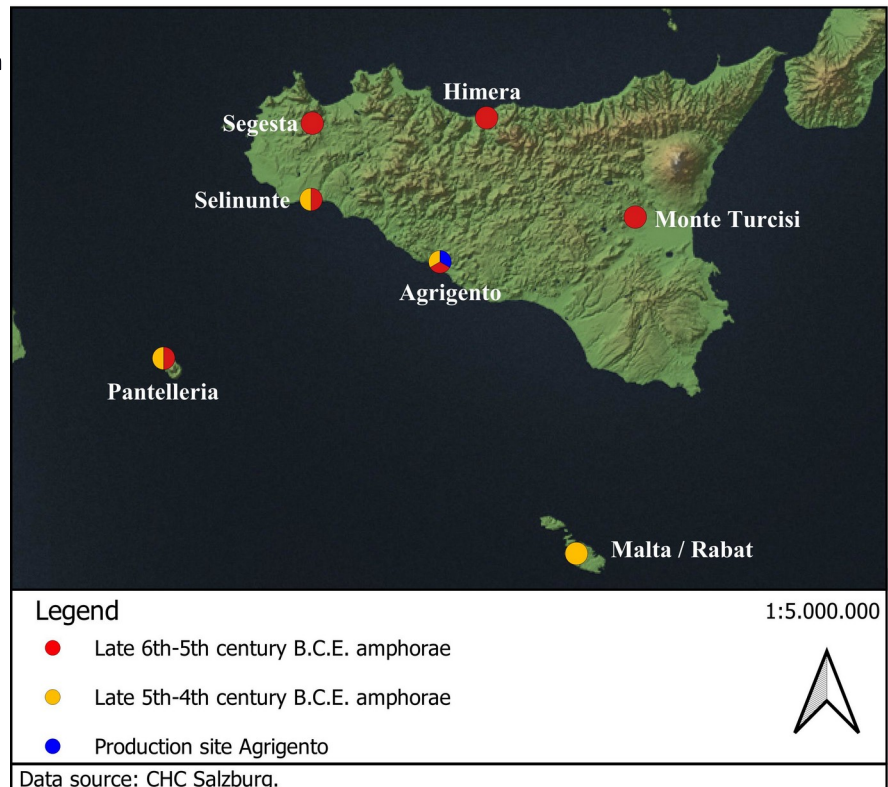
Highly interestingly and in comparison with the contemporaneous productions of Selinunte,<sup>73</sup> Himera<sup>74</sup> and Palermo/Solunto,<sup>75</sup> amphorae manufactured at Agrigento appear to be the colonial-Sicilian series with the most widespread distribution (fig. 5). Several late archaic items have been identified in the necropoleis of Himera, where the class represents the most frequent Sicilian production (apart from the local form 2 vessels).<sup>76</sup> It is also attested among the hitherto not very numerous, analyzed, late archaic amphorae from the acropolian sanctuaries of Selinunte and Segesta. Finally, single fragments found at Pantelleria and Monte Turcisi (Catania) might constitute first, important indications of a supra-regional circulation of this group.

**Fig. 5. The distribution of western Greek amphorae produced at Agrigento outside the production site.**

Agrigento in particular seems to stand out among Sicily's Greek colonies for a probably more widely extended and quantitatively relevant distribution of its agricultural commodities transported in form 2 amphorae. The main content of this later 6th-beginning of the 5th centuries B.C.E. shape, as well as of the whole class of western Greek amphorae, is generally believed to be wine.<sup>77</sup>

Whereas the currently available *archaeological* record testifies to a well-defined, late archaic series, yet the *literary* sources highlight Agrigento's flourishing 5th-century B.C.E. vineyards which contributed significantly to the colony's immense wealth (see note 1). Hitherto, the morphological feature of these latter classical period series remains, however, still quite vague. More provenance studies on western Greek amphorae from Sicilian sites are needed to clarify the distribution pattern of Agrigento's 5th-century B.C.E. series.

Better evidence is available for the late-5th and first-half-of-the-4th-century B.C.E. development of the local production which, again, seems to follow a more general, regional trend.<sup>78</sup> In regard to the very recent identification of late classical *Randform 7* vessels produced at Himera, a morphological tie with southern Campanian imports, namely from Poseidonia and well



73 Bechtold 2020b.

74 Bechtold et al. 2019, 12.

75 Bechtold 2020a.

76 Bechtold 2020c, fig. 5a-b, however, during the last quarter of the 6th and the 5th centuries B.C.E., Sicilian productions represent not even 13% of all western Greek amphorae (N 459). Apart from the local series, imports from Agrigento clearly outnumber the remaining Sicilian imports.

77 Most recent, see Sacchetti 2012, 42, 47 with earlier references.

78 Bechtold et al. 2019, 14; Bechtold 2020c, ch. 3.

documented in the local necropoleis, has been suggested,<sup>79</sup> also in consideration of the current absence in the Dorian-Chalcidian colony of late-5th B.C.E. southern Sicilian series. By contrast and on the basis of the on-going research mentioned in note \*, to date 5th-century B.C.E. amphorae from Tyrrhenian Poseidonia are conspicuously missing at our sampling sites located along the island's southern shores (Agrigento and Selinunte).<sup>80</sup> For Gela G. Spagnolo has already underlined morphological similarities between her late classical Gela II-type and several amphorae presumably produced at Agrigento, Selinunte and in the (Sicilian part of the) Strait of Messina area.<sup>81</sup> Further research has to strengthen the evidences for this presumed, late-5th and first-half-of-the-4th-century B.C.E. southern and northeastern Sicilian amphorae koiné which morphologically definitively differs from the late classical *Randform 7* amphorae produced in the non-Greek milieu of Palermo and/or Solunto<sup>82</sup> and Entella<sup>83</sup> in the northwestern part of the island.

Finally, and as a working hypothesis, we suspect that amphora fabrication at Akragas ceases or notably decreases towards the very late 4th-early 3rd century B.C.E. At present, it seems likely that this development could be related to the contemporaneous beginning of the widespread distribution of *Randformen 8-10*-vessels<sup>84</sup> produced in the Gulf of Naples as well as at Elea and Poseidonia. This phenomenon has already been ascertained for western Sicily,<sup>85</sup> but on-going systematic research at Agrigento<sup>86</sup> and previous observations on samples taken at Eraclea Minoa, Monte Adranone, San Benedetto di Caltabellotta, Licata, Gela and Camarina<sup>87</sup> hint at a massive increase, from the early Hellenistic period onwards, in the consumption of Campanian wine also along the island's southern shores.

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79 Bechtold et al. 2019, 9-10.

80 For the supra-regional distribution of 5th-century B.C.E. amphorae manufactured at Poseidonia, see also De Bonis et al. 2020, 18-9 with earlier references.

81 Spagnolo 2018, 290, note 60.

82 Bechtold 2020a, ch. 3-4, tab. 2, fig. 2.

83 Corretti and Michelini 2020.

84 For this new classification of southern Campanian 'Graeco-Italic' amphorae, see Gassner et al. 2014, 244-47.

85 For the widespread distribution of Campanian wine amphorae in western Sicily, see Bechtold 2018; Bechtold et al. 2018, both with earlier references.

86 Observations based mostly on provenance studies of the amphorae finds from the artisanal area at Porta V, see Baldoni and Scalici 2020, and from the Roman Temple, currently studied by G. Gerogiannis. Almost all of the hitherto 30 or so recorded 'Graeco-Italic' *Randformen 8-10*-amphorae, dating from the late 4th-mid 3rd centuries B.C.E., appear to be of Campanian fabric.

87 Olcese 2010, 269-84.

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