Publikationen des Deutschen Archäologischen Instituts

Philip Misha Bes, Anneke Keweloh-Kaletta

The Manufacture of Eastern Sigillata C and Late Roman C at Çandarlı, Ancient Pitane. Results of the Intensive Survey (2019–2021)

Istanbuler Mitteilungen 74, 2024, § 1–139

https://doi.org/10.34780/96df-8en9

Herausgebende Institution / Publisher:
Deutsches Archäologisches Institut

IMPRESSUM

Istanbuler Mitteilungen
erscheint seit 1933/*published since 1933*

IstMitt 74, 2024 • 404 Seiten/*pages* mit 311 Abbildungen/*illustrations*

Peer Review
Alle für die Istanbuler Mitteilungen eingereichten Beiträge werden einem doppelblinden Peer-Review-Verfahren durch internationale Fachgutachterinnen und -gutachter unterzogen./*All articles submitted to the Istanbuler Mitteilungen are reviewed by international experts in a double-blind peer review process.*

Indices
Istanbuler Mitteilungen sind indiziert im/*Istanbuler Mitteilungen are indexed in the* European Reference Index for the Humanities and Social Sciences ERIHPLUS und in der/*and in the* Expertly Curated Abstract and Citation Database Scopus.

Redaktion und Layout/*Editing and Typesetting*
Gesamtverantwortliche Redaktion/*Publishing editor*:
Deutsches Archäologisches Institut, Redaktion der Abteilung Istanbul, İnönü Caddesi 10, 34437 Gümüşsuyu-Istanbul, Türkei
Kontakt für Manuskripteinreichung/*Contact for article submissions*: redaktion.istanbul@dainst.de
Redaktion/*Editing*: Martina Koch, Ulrich Mania
Satz/*Typesetting*: le-tex publishing services GmbH, Leipzig
Corporate Design, Layoutgestaltung/*Layout design*: LMK Büro für Kommunikationsdesign, Berlin
Umschlagfoto/*Cover illustration*: Ausschnitt aus Abb. 15 im Beitrag von Westbrook – Nowland (Grafik: Nigel Westbrook auf Basis von Melchior Lorck: http://hdl.handle.net/1887.1/item:2026523)/*Detail from fig. 15 in the article by Westbrook – Nowland (graphic: Nigel Westbrook based on Melchior Lorck:* http://hdl.handle.net/1887.1/item:2026523)

Druckausgabe/*Printed edition*

Druck und Vertrieb/*Printing and Distribution*: Dr. Ludwig Reichert Verlag, Tauernstraße 11, 65199 Wiesbaden • info@reichert-verlag.de, www.reichert-verlag.de

P-ISSN: 0341-9142 – ISBN: 978-3-7520-0870-8

Druck und Bindung in Deutschland/*Printed and Bound in Germany*

Digitale Ausgabe/*Digital edition*

Webdesign/*Webdesign*: LMK Büro für Kommunikationsdesign, Berlin
XML-Export, Konvertierung/*XML-Export, Conversion*: digital publishing competence, München
Programmierung Viewer-Ausgabe/*Programming Viewer*: LEAN BAKERY, München

E-ISSN: 2940-8202 – DOI: https://doi.org/10.34780/bwxtyg03
Zu den Nutzungsbedingungen siehe/*For the terms of use see*: https://publications.dainst.org/journals/index/termsOfUse

ABSTRACT

The Manufacture of Eastern Sigillata C and Late Roman C at Çandarlı, Ancient Pitane

Results of the Intensive Survey (2019–2021)

Philip M. Bes – Anneke Keweloh-Kaletta

This article presents the results of an intensive archaeological survey at modern Çandarlı (ancient Pitane), which since 1911 is well-known as a place of manufacture for terra sigillata during the first three centuries A.D. Within the framework of the TransPergMicro Project, the archaeological zone in the centre of the Çandarlı Peninsula was systematically fieldwalked in 2019 and 2020 in order to investigate and document local pottery manufacture as part of broader artisanal and economic developments within the Pergamon micro-region during the Hellenistic and Roman Imperial periods. The survey yielded an abundant and rich collection of artefacts – fully studied in 2021 – which provides a clearer picture of the typological repertoire as well as technological aspects of the actual manufacture and firing. One of the more interesting results was finding archaeological evidence for the local production of Late Roman C, which signifies that tableware manufacture at Pitane continued into Late Antiquity.

KEYWORDS

Pitane, Eastern Sigillata C, Late Roman C, archaeological survey, Roman pottery manufacture

The Manufacture of Eastern Sigillata C and Late Roman C at Çandarlı, Ancient Pitane

Results of the Intensive Survey (2019–2021)

This article is in memory of John W. Hayes (1938–2024)

Introduction

1 The material cultural phenomenon of terra sigillata/red slip ware[1] (TS and RSW henceforth, respectively) played a key role in the lives of artisans and customers alike between the mid-2nd century B.C. and 7th century[2]. What began as a technological and stylistic innovation presumably somewhere in the wider region of Antioch-on-the-Orontes – then still part of the Seleucid Kingdom – around 150 B.C.[3], in the next 150 years or so would spread and provide inspiration across the Mediterranean, Pontic areas and Western Europe. TS and RSW, however, were not ubiquitous in each household, nor were these the only categories of tableware vessels intended for the serving and consumption of food and beverages throughout the entire Roman Imperial to Late Antique period. Nevertheless, much of the mechanisms that underpinned the diachronic spread and adoption of this new style elude us, in particular regarding the Eastern

1 For a concise introduction to the topic: Hayes 1997, 37–74, especially 41–64. The Pitane survey project would not have been possible without the support of the students Felicia Kant, Çiçek Karakaş, Ilayda Ötgün, Hannah Peters, Niklas Royar, Fabian Sliwka and Özge Şükür during the fieldwork and finds processing in the 2019–2021 campaigns. We would like to express our sincere gratitude to all of them as well as to Peter Schork and Joshua Simonis for measuring the grid system and finds in the 2019–2020 field campaigns and Berslan Korkut for taking aerial photographs in 2020. Furthermore, we wish to thank Dr. Alexander Harizanov (National Institute of Archaeology and Museum, Bulgarian Academy of Sciences, Sofia) and Prof. Dr. Jeroen Poblome (KU Leuven) for sharing their expertise concerning some of the finds. Also, we are most grateful to the two anonymous reviewers for their valuable comments and suggestions, which significantly helped to improve the text and argumentation. We are indebted to Dr. Bernhard Ludwig (DAI Istanbul) for the discussion and preparation of the distribution maps. The authors also thank the Ministry of Culture and Tourism of the Republic of Türkiye and its Kültür Varlıkları ve Müzeler Genel Müdürlüğü for their permission to study the finds from Çandarlı that are presented here, as well as our government representatives, Handan Ötkan (2019) as well as Nihal Metin and Ayşe Tok (both 2020).

2 All dates are ca. and A.D., unless (1) otherwise mentioned; or (2) when confusion could arise.

3 For a recent discussion on the origins of TS, and Eastern Sigillata A in particular, see Shipley 2018.

Title page: Spacer disc fused with the underside of a vessel's ring base, Inv. UM19 Fst. 02.15D KF 1511

Mediterranean, where only few manufacturing sites have been properly researched and documented.

2 Already in Hellenistic times, Pergamon and its micro-region[4] played a leading and creative role in the manufacture and distribution of slipped and finely decorated tableware vessels[5], which could count on widespread popularity. The Pergamene micro-region succeeded in maintaining and in fact expanding this (economic) role throughout the Roman Imperial period with so-called Eastern Sigillata C (ESC henceforth)[6]. Whereas ESC is a modern classification, it concerns a specific morphological design, made in certain fabrics, comprising a range of specific vessel forms for serving and consumption purposes, and while external stylistic influences can be detected, as a whole, ESC and its constituent forms was firmly rooted in local-regional concepts. ESC was distributed to numerous smaller and larger communities within the Pergamon region as well as across the Aegean and Pontic areas, and in more modest quantities also beyond[7]. A significant share of this export was presumably manufactured at coastal Çandarlı – ancient Pitane – which was identified as a manufacturing centre of TS as early as 1911 and was in fact the first of its kind to be identified in the Eastern Mediterranean[8]. Whilst the excavator, Siegfried Loeschcke, did not find remains of actual pottery kilns or ancillary workshop infrastructure, the artefactual testimonies he recovered remain indisputable, as does his account remains valuable for the evidence presented and observations made.

3 John W. Hayes formalised the main exponents of the locally manufactured repertoire, which he dated to the 2nd and 3rd centuries, under the name Çandarlı Ware in his seminal Late Roman Pottery[9]. Since Loeschcke, however, besides occasional, intermittent visits and short studies by various scholars[10], the local manufacture of tablewares (a term also used in this article to refer to TS and/or RSW) at Çandarlı was never systematically investigated. Of particular interest were the results of chemical analyses, which pointed out that the manufacture of tablewares at Çandarlı did not halt by about 300, something which Hayes already suspected[11]. In fact, manufacture continued with a branch of Late Roman C (LRC from here on)[12] – which at least archaeologically has essentially gone unnoticed – a morphological style of 4th- to 7th-century RSW comprising mostly various bowl types, again with a regionally-conceived morphological – and decorative, given the multitude of stamp types – design[13]. Both ESC and LRC were produced on a regional scale, meaning that there were multiple production centres making similarly styled tableware vessels within a relatively confined area. Evidence for the manufacture of ESC-style vessels has been attested at the Aiolian cities of Pergamon, Pitane, Elaia and Gryneion[14]. In the case of LRC the production zone encompassed centres in Aeolis as well as Ionia, of which Phokaia is still regarded as having been the most prolific concerning manufactured and distributed quantities. The discovery of production evidence at Phokaia eventually prompted Hayes to term it

4 For a definition of micro-region as employed by the TransPergMicro Project, see Pirson et al. 2024, 3–5 figs. 2. 3.

5 E.g. Behr 1988; Hübner 1993; Meyer-Schlichtmann 1988; Schäfer 1968. For a brief overview see Japp 2013.

6 Engels et al. 2013 and Japp 2014, 15–18, present a recent definition of ESC that also encompasses the Late Hellenistic period, when red slipped tableware vessels were already manufactured in Pergamon.

7 For the distribution of ESC in the Eastern Mediterranean, see Bes 2015, 27–89. 142 fig. 104.

8 Loeschcke 1912.

9 Hayes 1972, 316–322. 459 map 13. It is also discussed in Carandini 1981, 231; Hayes 1985, 71–78; Hayes 2008, 49–52; in the latter these are grouped under »Red-Gloss Wares of the Pergamon Region«.

10 E.g. Empereur – Picon 1986; Bounegru 1996; Domżalski 2014. For an excavation at the site, see Soyaker – Nalbantoğlu 1999.

11 Hayes 1972, 316 f. 369.

12 Japp 2009, 200. 203; Engels et al. 2013; Japp 2014, 21.

13 Hayes 1972, 323–370.

14 Pergamon: Bounegru et al. 2001; Elaia: Ateş 2017; Ateş 2018; Gryneion: Empereur – Picon 1986; Dereboylu Poulain et al. 2018.

»Phocaean Red Slip Ware«[15]. In addition, Pergamon, nearby Gryneion (which is, regrettably, barely studied regarding tableware manufacture) and Ephesus all manufactured LRC-style tablewares[16]. Further manufacturing sites of LRC, as well as ESC, may have existed yet remain unidentified for now. For example, a claim for local manufacture of LRC has been made for Adramytteion, yet archaeological and archaeometric evidence supporting this hypothesis is lacking[17]. It is assumed that production sites of LRC other than Phokaia were of mere local and regional significance regarding circulation and supply; in other words, they catered essentially to local and regional markets, contrary to Phokaia, whose products have been identified at sites far and wide across the Mediterranean and Pontic areas[18], even as far away as northwest Spain[19] and (albeit in small quantities) western Gaul[20] and southern Britain and Ireland[21]. The geographic and quantitative-proportional role of the various ESC and LRC production centres in regional and supraregional distribution patterns basically has not been studied, mostly because of a poor understanding of the macroscopic properties as well as morphological and decorative repertoire of the different production centres[22].

4 It is against this background that this article presents the results of an intensive survey (henceforward: Pitane Survey, or survey) at modern Çandarlı in 2019–2020, which was followed by a study season in 2021[23], within the framework of the TransPergMicro Project[24]. The results of this survey contribute in two ways, namely to our understanding of (1) the Pergamon micro-region regarding resource exploitation, technological considerations, artisanal life, and economic activities; and (2) TS and RSW manufacture and distribution. A summary of the aims and methodology is followed by a discussion of the results of the survey that will contribute to the socio-ecological model that the TransPergMicro Project is developing, which captures human-nature interaction, socio-cultural conditions and economic activities (including resource exploitation) specifically during the Hellenistic and Roman Imperial periods.

Geographic Setting and Description of the Survey Zone

5 Ancient Pitane was situated where one nowadays finds modern-day Çandarlı[25], a sizeable coastal township on the south side of the Kane Peninsula and on the north side of the Gulf of Çandarlı (Turkish: Çandarlı Körfezi) in the province of Izmir, more precisely in Dikili, one of the province's northern districts (Fig. 1). It is located some

15 Langlotz 1969, 379–381; Hayes 1980, 525.

16 Pergamon: Japp 2009; Gryneion: Dereboylu Poulain et al. 2018; Ephesus: Ladstätter – Sauer 2005; Waldner – Ladstätter 2014.

17 Şahin 2020, 217. 235. The author (Şahin 2020, 230) does report on a pottery kiln thought to have been used for manufacturing »grober [sic] Gebrauchskeramik (Vorratsgefässe)« during the Late Roman period.

18 See Hayes 1972, 368 f. 459 f. maps 14–16; for the Western Mediterranean, see Reynolds 1995, 34–36. 162–164 fig. 162; for the Eastern Mediterranean, see Bes 2015, 90–141. 143 fig. 105.

19 Fernández 2014, 221–262.

20 Le Bomin 2020, 50.

21 Campbell 2007.

22 See Vaag 2005 for a critical assessment; see also Bes – Keweloh-Kaletta 2022.

23 For preliminary reports and related publications concerning the Pitane Survey, see Bes – Keweloh-Kaletta 2020; Bes – Keweloh-Kaletta 2021; Bes – Keweloh-Kaletta 2022; Bes – Keweloh-Kaletta 2023; Bes – Keweloh-Kaletta 2024.

24 The TransPergMicro Project is funded by the Deutsche Forschungsgemeinschaft (German Research Foundation) and directed by Felix Pirson (DAI Istanbul) with Brigitta Schütt (FU Berlin, Geography) and Thekla Schulz-Brize (TU Berlin, Historical Building Research). Other applicants are Güler Ateş (CBÜ Manisa), Daniel Knitter (CAU Kiel) and Ulrich Mania (DAI Istanbul). The Pitane Survey (2019–2021) was carried out within the framework of the DAI-Pergamon Project directed by Felix Pirson. For current information on the TransPergMicro Project see <https://www.dainst.blog/transpergmikro> (19.03.2024).

25 References to Fst., units and walking lines take on the following form: Fst. 01.32B, for instance, means Fst. 01, unit 32, walking line B.

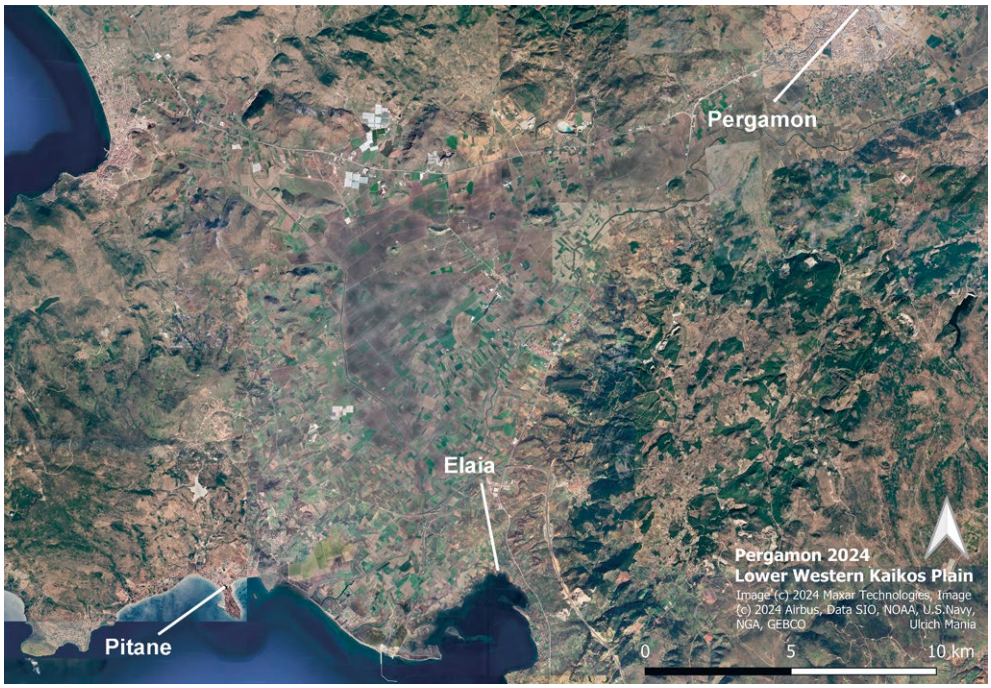


Fig. 1: Location of Çandarlı/Pitane. Modern Bergama – ancient Pergamon – is located in the top right corner

1

30 km southwest of Bergama/Pergamon as the crow flies; a tentative reconstruction of the ancient route from Pergamon to Pitane measured this at just over 35 km[26]. The modern Bakırçay – the ancient Kaikos River – traverses the plain east, south and southwest of Pergamon, and debouches in the aforementioned gulf, between Pitane/Çandarlı and Elaia (modern Zeytindağ). Few, albeit significant remains of Roman Imperial-period Pitane have been identified and mapped in recent years, most notably those to the west of the peninsula, which are associated with harbour and storage infrastructure[27].

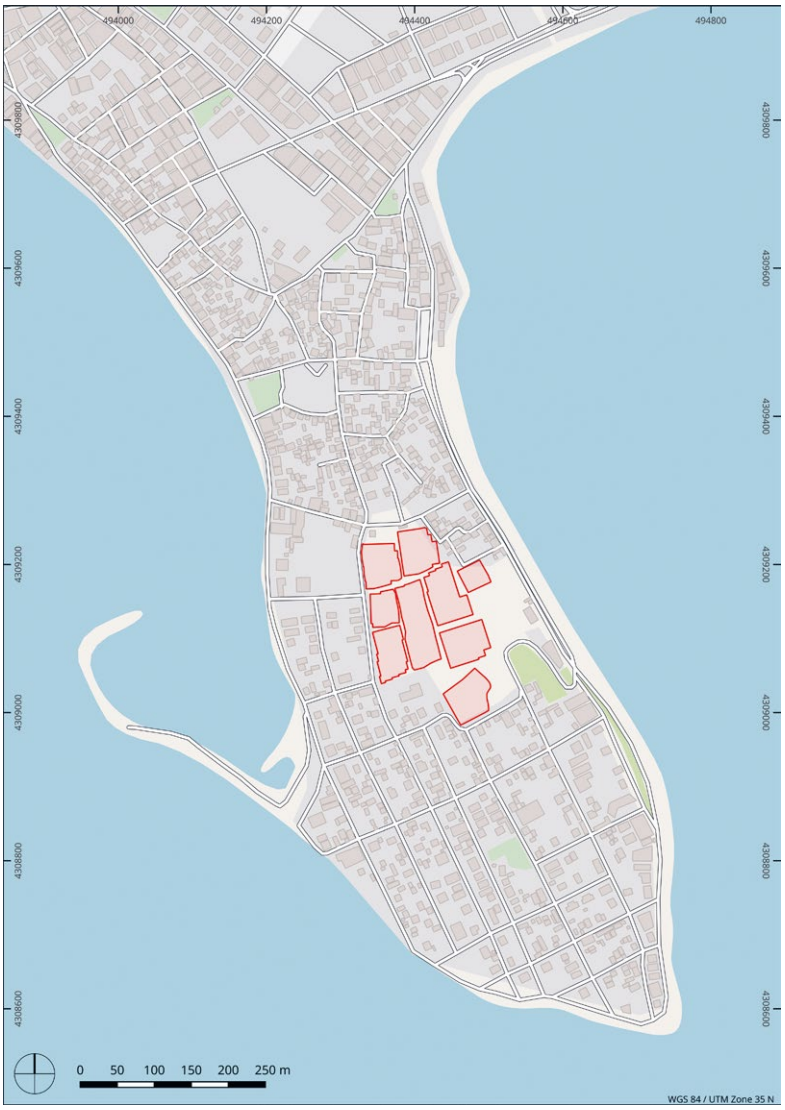
6 The archaeological zone is located in the centre of the Çandarlı Peninsula (Fig. 2), which extends southwards from the mainland, where the terrain gently slopes up in a south-southeast direction (Fig. 3): some 10 m from the northwest corner to the southern part. The zone roughly measures some 250 m (north-south) by 150 m (east-west). In recent years, this zone was invariably used[28] (1) by people traversing; (2) for growing olive trees in some parts for at least the last 17 years; and (3) to grow small-sized crops, e.g. in 2019 red chili plants were cultivated in part of one of the fields. However, it appears that parts were not maintained/ploughed or used for agricultural purposes, resulting in a dense, weedy overgrowth and/or a gradual accumulation of rubbish or storage of various implements (cf. infra).

7 The survey zone comprises a number of fields, most of which are separated by banks at a slight elevation, or field walls composed of stone rubble and archaeological artefacts. Fieldwork proper was bound by the limits of the archaeological zone, within which seven Fundstellen (Fig. 4) were defined using the aforementioned field boundaries, and subsequently gridded and intensively surveyed. Within the context of archaeological survey in the Pergamon micro-region, a Fundstelle (Fst. hereafter, singular and plural (Fundstellen)) is defined as a findspot with a structural and/or functional (archaeological) context, where quantity, complexity and size are such that they do not

26 Ludwig 2020; Ludwig 2021, 97.

27 Laufer 2016, 181–184; Feuser – Laufer 2018, 157–161; Ludwig 2021, 99–101.

28 Observations partly made using Google Earth (07.12.2023).



2

Fig. 2: The Çandarlı Peninsula, with the nine fields or Fundstellen outlined in red

allow individual registration (e.g. of an artefact)[29]. While the archaeological or surveyed zone at Çandarlı as a whole can be seen as a Fst., instead, for practical and interpretive purposes, each of the seven fields was defined as one.

8 Fst. 01–02 were defined, gridded and systematically fieldwalked in 2019, Fst. 03–07 in 2020. Two further fields one to the south (Fst. 08) and one to the east (Fst. 09, the area in fact where Loeschcke excavated in 1911), could be neither gridded nor systematically surveyed, though their condition and visibility were documented, and a small quantity of diagnostic artefacts was collected from both (cf. infra). Figs. 5. 6. 7 present the maps for the visibility-corrected counts of densities, architectural fragments, and pottery manufacturing waste in Fst. 01–07, respectively, with Fig. 8 capturing some of their main spatial and artefactual (visibility-corrected) aspects.

9 Specific aspects of local tableware manufacture as well as a diachronic perspective will be presented and discussed synthetically in subsequent parts of this article. It nevertheless serves these purposes to summarily introduce Fst. 01–09 individually.

10 **Fst. 01** borders all Fst. that were systematically fieldwalked: Fst. 02–03 to its west, Fst. 04 and Fst. 05 to its northwest and northeast respectively, and Fst. 06–07 to its

29 Pergamongrabung, Dokumentationsrichtlinien und Hinweise (›Pergamon Excavation, Documentation Guidelines and Instructions‹) (16.6.2024).

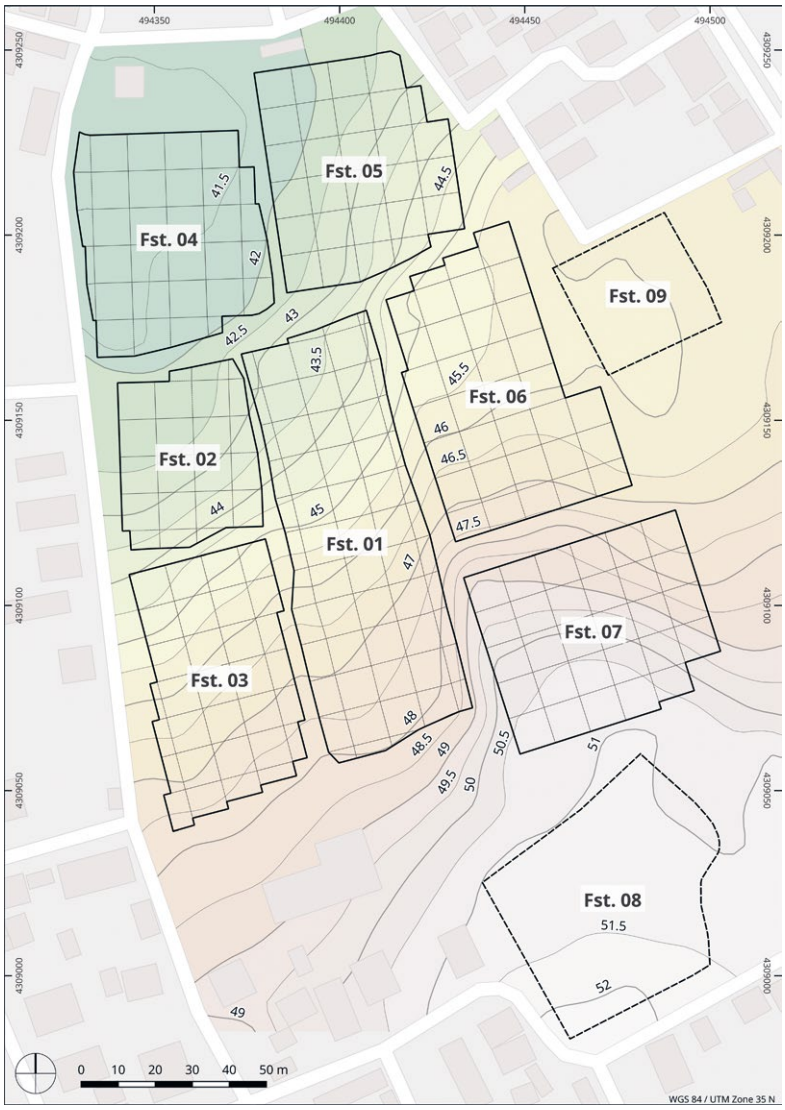


Fig. 3: The archaeological and survey zone in detail, with elevation contour lines indicated per 0.5 m intervals. Each Fundstelle (Fst.) is outlined in black, the raster grids within Fst. 01 to 07 mark the survey units

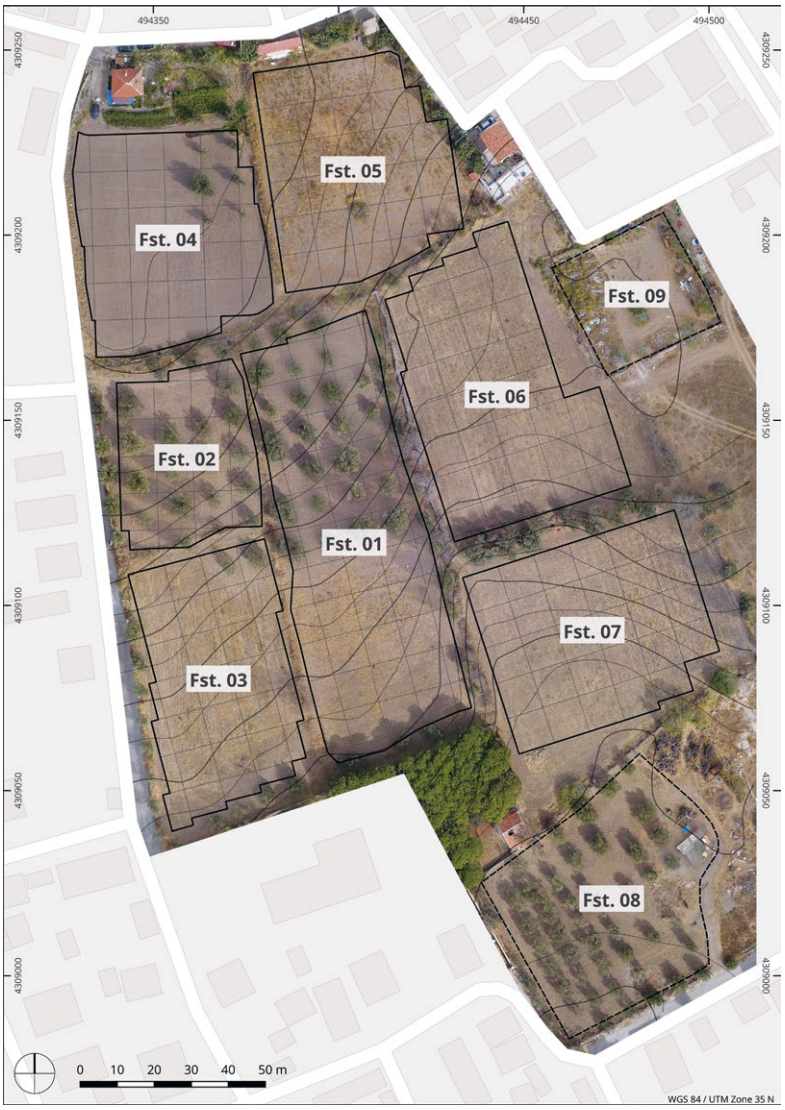
3

east. A school building and yard bound it to its south. The olive trees in its northern half as well as patchy vegetation across its southern half had some impact on the visibility. A stone-lined well was spotted in the centre of this field[30]. The surface was scattered with archaeological artefacts (including vessel wasters, being somewhat more common in the northeast corner) and stones, the latter to some degree plausibly the remains of ancient structures.

11 **Fst. 02** wedged between Fst. 01 to its east, Fst. 03 to its south, Fst. 04 to its north and the modern tarmacked street (the Uzun Sokak) to its west is fully covered by an olive grove. Some grass and weeds caused a somewhat lower visibility. Probably, the (very) high counts in units Fst. 02. 07–08 and 14 (partly) result from pottery which was collected and, after documentation, thrown back, during a preliminary survey in 2015 in the framework of the Kane Regional Harbour Survey[31]. In the southeast corner, a noticeable quantity of 1st-century ESC was observed (see Fig. 37), and a high number of vessel wasters in the northeast corner. Several, often warped, tile and waterpipe frag-

30 The digging of this well – also see Fst. 05 for a second well in the survey zone – surely brought quantities of soil and archaeological artefacts to the surface which, unless what was dug up was carried off, presumably affected the immediate surface surroundings.

31 Fst. 02 as defined in 2019 is the same as UM15 Fst. 05 as defined in 2015; see Laufer 2016, 182 fig. 53.



4

Fig. 4: The Fst. mapped on top of a drone photograph, with elevation contour lines indicated

ments were attested, sometimes with parts of misfired and/or fused vessels attached. Our hypothesis is that (fragments of) tiles and waterpipes were embedded in the walls of kilns or were used as some sort of spacers and/or stabilisers (cf. infra) during the stacking process, rather than their actual manufacture.

12 **Fst. 03** is located in the southwest corner of the survey zone, having Fst. 01 to its east, Fst. 02 to its north, the modern street (Uzun Sokak) to its west and the school building/yard to its south. This field was otherwise not ploughed. Artefacts evidencing local pottery manufacture appear to be more fragmented than in other Fst. Of particular interest was a large quantity of highly distinct ESC fragments, with good orange slip and a typological repertoire datable to the Augustan-Claudian period, in the northeast corner, and which can probably be linked with similar finds in Fst. 02's southeast corner (see Fig. 37).

13 **Fst. 04** is located in the northwest corner of the survey zone, having Fst. 02 to its south, Fst. 05 to its east and the same street as above to its west. This field had been ploughed not long before, with some tracks reaching a height of 20–25 cm. Except for a few olive trees in the northeast corner, the lack of any real vegetation offered near-ideal circumstances for visibility and fieldwalking. Four aspects set Fst. 04 apart from the other Fst.: (1) artefact densities were dramatically lower; (2) artefacts appeared to be more fragmented than elsewhere in the survey area (mostly ca. ≤5 cm), except perhaps for Fst. 03 and Fst. 06; (2) the scarcity of pottery manufacture-related artefacts;

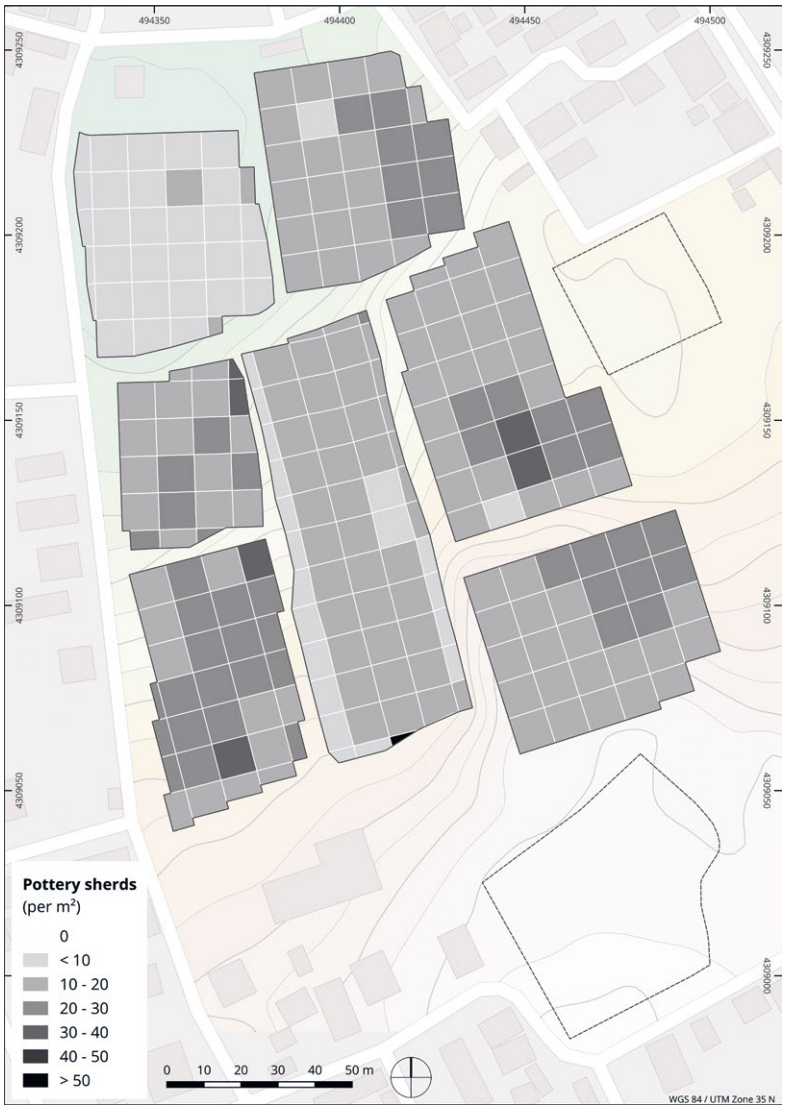


Fig. 5: Map showing the visibility-corrected counts of pottery fragments per m²

5

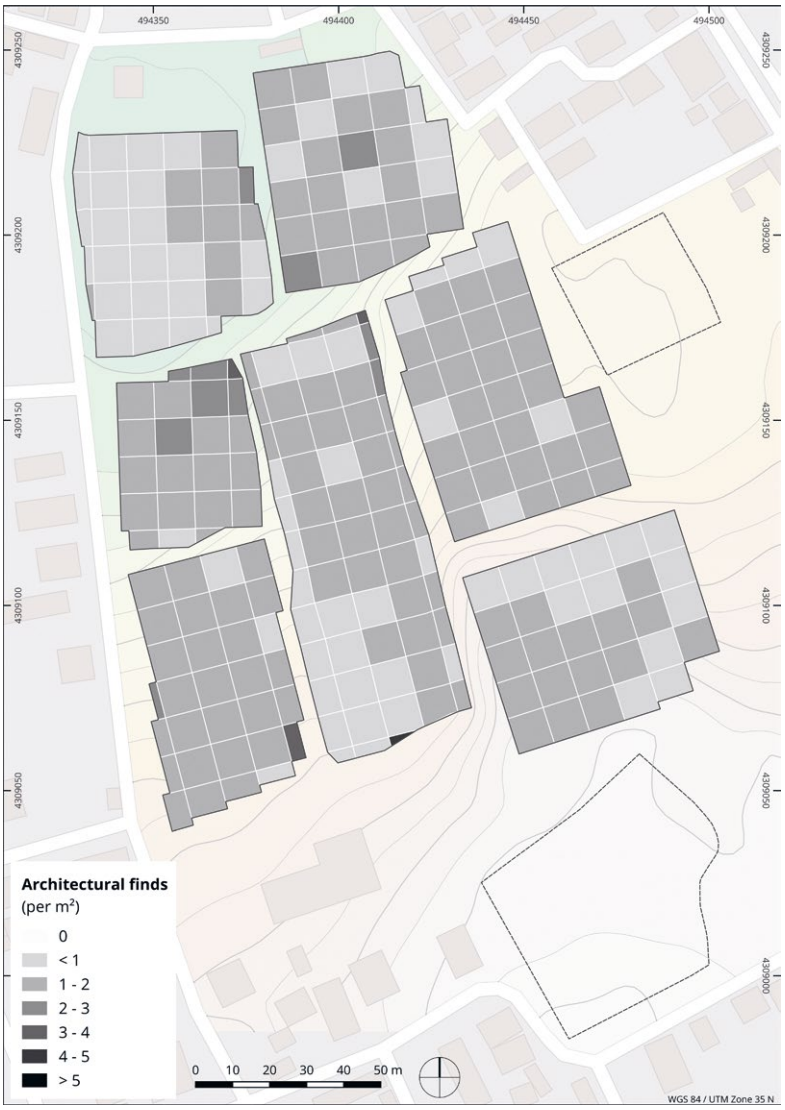
and (4) a surprisingly strong presence of glazed and unglazed fragments that mostly seem Ottoman in date.

14 **Fst. 05**[32] is located in the northeast corner of the zone, with Fst. 04 to its west and Fst. 06 to its south. Just south of the centre of this field there was a stone-lined well with a depth of ca. 5.5 m. Artefact fragmentation appeared more variable in this Fst. Also, densities decreased whereas fragmentation increased in the western part. Recalling what was observed for Fst. 04, this potentially suggests that Fst. 04 and the western part of Fst. 05 need to be studied in conjunction; however, Fst. 05 was richer in pottery manufacture-related artefacts.

15 **Fst. 06** is located south of Fst. 05, east of Fst. 01 and north of Fst. 07 with Fst. 09 (Loeschcke's field) to its east. A narrow stretch right along the western boundary wall was eventually excluded from systematic fieldwalking due to find quantities probably biased by modern depositional processes[33]. It was observed that pottery fragments from across Fst. 06 are relatively small in comparison to most other Fst.

32 This was defined as Fst. 08 during the preliminary survey of 2015, see Pirson 2016, 182 f. fig. 53.

33 Lines A in Fst. 06.01–03 directly run along the boundary wall located to their west (with Fst. 01 on the other side of this wall, to the west), and many of the stones and slag fragments that were noted in these lines almost certainly had been part of that boundary wall but had rolled down.



6

Fig. 6: Map showing the visibility-corrected counts of architectural fragments per m²

16 **Fst. 07** has Fst. 06 to its north and Fst. 08 to its south. Fst. 07 presented various interesting aspects: First, whereas Late Roman pottery occurs across much of the survey zone, it was all but absent here. Second, across Fst. 07's central zone, large Roman-period roof tile fragments were noted, pointing to a roofed structure, or tile graves. Third, in the southern, upslope part, quantities of Roman Imperial and younger pottery were mostly absent, whereas a dense scatter of Classical-(Early) Hellenistic pottery appeared instead. Fourth, in the north-northeast part ceramic finds near-exclusively comprise local ESC and production waste, with some fragments being exceptionally large (e.g. 1/3 of a Hayes Form 1 bowl). The ESC repertoire consists almost exclusively of carinated and flanged bowls, respectively Loeschcke Types 26 and 19 as well as both forms' successors, that is, Hayes Forms 1–2, and 3.

17 **Fst. 08** and **Fst. 09**, as mentioned, were not surveyed yet and deserve a summary description. The rows of trees in Fst. 08's western half helped to give direction to a cursory inspection. Here, visibility was ca. 80 %, and a small quantity of morphologically diagnostic artefacts was collected. Overall, however, artefacts were not common. It was previously established that **Fst. 09** was the site of Loeschcke's excavations in 1911[34]. ESC

34 In the context of the »Kane Regional Harbour Survey« in 2015 – it is cadastral field 2723 – when, conveniently, it had been labelled UM15 Fst. 09.

Fig. 7: Map showing the visibility-corrected counts of fragments of kiln slag and kiln lining per m²

7

fragments occurred in abundance, some being surprisingly large, and many having a well-fired and often very shiny brownish-red slip that is reminiscent of (later) Italian Sigillata[35]. Based on this slip quality as well as typological features, many ESC fragments here date to the 1st, early 2nd century. Production waste was not at all plentiful, though a few very large pieces of kiln slag were collected and inventoried[36]. Their size is a further indication that this field was not used other than for ›storage‹: elsewhere, when a field was in use for small-scale agriculture and therefore also ploughed – albeit irregularly – such large pieces would have been moved to the edge of a field and/or included in a field wall[37].

35 Recalling what Hayes observed (Hayes 1972, 316; Hayes 2008, 51): »a fine, shiny, deep brownish red gloss scarcely distinguishable from that of the later Italian Sigillata«.

36 E.g. UM20 Fst. 09 KF 430 and UM20 Fst. 09 KF 444. The abbreviation KF stands for Kleinfund (›Small Find‹) and is specifically used for ceramic (small) finds that were already singled out for inventory during the fieldwork. A single K (abbreviation for Keramik) in combination with a number can also occur, denoting pottery finds that were selected in the course of the study season for drawing and/or (fabric) photography.

37 Loeschcke 1912, 352 fn. 1: »Grosse Schlackenbrocken aus dem Abbruch zerstörter Öfen sind z. B. in den die Felder trennenden Mauern oberhalb des Weinberges verwertet« (›Large chunks of [kiln] slag from the demolition of destroyed kilns are utilised, for example, in the walls separating the fields above the vineyard‹).

	Visibility (%)			Units			
Fst.	Lowest	Highest	Average	Total	Complete	Partial	Surface (m²)
01	50	95	77.6	61	33	28	4275.4
02	50	90	76.1	22	16	6	1648.4
03	20	95	55.7	31	18	13	2520
04	20	100	92.1	33	23	10	2682.8
05	10	95	65.1	28	27	1	2681.9
06	15	95	68.2	34	25	9	3161
07	35	95	73.4	29	28	1	2880

	Count (Visibility Corrected)								
	Density			Architectural Fragments			Production Waste		
Fst.	Lowest	Highest	Average	Lowest	Highest	Average	Lowest	Highest	Average
01	32.6	520	263.3	0	56.7	21.7	0	36.7	9.6
02	31.1	813.8	324.8	2.2	65.3	29.8	0	55	12.3
03	108	877.1	450.7	2.9	80	27.4	0	25.7	9
04	74.7	465	163.7	1.1	50	17.3	0	5	0.3
05	81.7	910	347.6	4.4	110	26.6	0	22.2	4
06	123.1	948.6	366.2	8.4	62.9	27.2	0	100	14
07	162.1	746.7	352.3	2.7	43.1	20.7	0	51.8	9.9

8

Fig. 8: Some of Fst. 01–07's main spatial and artefactual-quantitative aspects

Aims and Methodology

18 The objective of the Pitane Survey was to document the typology, chronology, and manufacturing aspects of local tableware production from a diachronic perspective. This, in turn, should contribute to a better understanding of resource exploitation as well as artisanal and economic life in Pergamon's micro-region[38]; the broader context of this survey has already been summarised (cf. supra).

19 Each Fst. consisted of a number of units, each unit measuring 10 m × 10 m, which was partitioned into strips of 2 m × 10 m, resulting in five walking lines labelled A to E. Especially along the edges of a field, units consisted of four or less walking lines aiming to cover as much of a Fst. as was reasonably feasible (see Fig. 3). Each walking line was assigned to a team member who (1) determined visibility (in %) for visibility correction of counts later on[39]; counted (2) density[40]; (3) architectural fragments[41]; and (4) manufacturing evidence (cf. infra). Then, a selection of artefacts was collected again per walking line. The survey of a unit was de facto completed by one team member walking a zig-zag line perpendicular to walking lines A-E. This last step was intended to accommodate the specifics of the (time of) day, e.g. the angle of sunlight, whether it was clouded, etc.

20 Due to very high find quantities in most Fst. a total collection was not even considered as an approach. Therefore, the collection strategy largely targeted diagnostic fragments attesting the local manufacture. This not only concerned fragments (e.g.

38 See Bes – Keweloh-Kaletta 2024 for thoughts on chaîne opératoire and ceramic ecology.

39 Visibility was determined with reference to barren (parts of) Fst.: For example, much of the freshly ploughed Fst. 04 represented 100 % visibility, and partly or heavily overgrown (parts of) Fst., such as the southern half of Fst. 01, represented 50 % visibility or less. We did not formally quantify surfaces covered with various kinds of vegetation, etc., in order to reach a visibility score.

40 Using a hand-clicker, a standard tool used in archaeological survey.

41 These mostly comprised pieces of brick and tile, though fragments of marble wall veneer (crustae) were common in parts of the survey zone, and a small number of architectural and sculptural fragments in stone was also identified and collected.

rims, bases, decorated fragments) that display varying stages of success and failure, but also artefacts that were used in the manufacture and firing processes or were the waste residue of that manufacture. Furthermore, fragments datable to periods other than Roman Imperial to Late Antique (25 B.C.–600/650) and/or attributable to functional ceramic categories other than local tablewares were identified and collected as well. The collection method was to some extent also focused on body sherds, because vessel types such as amphorae and (many) cooking vessels mostly produce body sherds upon initial breaking and during subsequent processes. Focusing solely on morphologically diagnostic fragments reduces the interpretive value of these categories. Identifying the fabric of morphologically non-diagnostic fragments helps to obtain a more varied picture of local/regional and imported pottery.

21 The abundance of artefacts on the surfaces of Fst. 01–07 also prompted to devise a strategy for capturing quantitative and (potential) diachronic variability. Some 34,000 ceramic artefacts were collected in the course of the two years of survey, ca. 7800 of which represent local tableware manufacture that were brought to the Pergamon excavation house and depots for subsequent study and storage. A (small) part of these 7800 artefacts was possibly not manufactured at Pitane proper but is instead likely of regional origin; plausibly, part came from Pergamon itself. Included in the total of ca. 34,000 collected artefacts, 16,743 were classified and tallied typologically during fieldwork, after which they were brought back to their respective unit. Whereas the data quality and resolution of these collected-then-discarded fragments is more restricted, it nevertheless offers a robust quantitative addition to the diachronic overview of the survey zone based on artefacts brought back and studied in the excavation house. In distribution maps used in this article, no distinction is made between artefacts studied/tallied in the field and those studied in the excavation house, exactly in order to strengthen spatial-quantitative distribution and make potential patterns more visible. Moreover, the fine-grained survey methodology and relatively large artefact quantities that were collected were deemed sufficient to obtain a thorough picture of the archaeological surface in question. A further ca. 9500 ceramic artefacts concern other periods, or Roman-period ceramic categories other than locally or regionally manufactured tablewares and related artefact categories (i.e. tools). These 9500 artefacts include, for example, a rich and geographically varied collection of amphora fragments[42]. Last, whereas the quantity of collected artefacts in relation to the actual surface zone might seem exaggerated, it is important to keep in mind that opportunities to document and study pottery manufacturing sites do not abound or are rarely grasped.

22 In order to systematise the study of all collected ceramic artefacts, a fabric reference collection was created. This relied on the identification and classification of macroscopic properties viewed on fresh breaks and using a hand lens, and proved to be an extremely valuable methodological instrument which assists in the processes of comparing, identifying and attributing fragments. First and foremost, this reference collection concerned all fabrics related to ESC (starting with PIT 001) and LRC (starting with PIT 051). All other tableware (predominantly Classical to Late Hellenistic, beginning with PIT 076), amphora (beginning with PIT 101), storage vessel (beginning with PIT 301) and cooking pottery (beginning with PIT 401) fabrics were labelled accordingly.

23 An EXCEL file was created in order to store these data, whose structure was partly based on that used by the Ancient Cities of Boeotia Project[43]. Besides fields for spatial information (Fst., unit, etc.), the core comprises parameters such as provenance,

42 These are to be studied by the first author in collaboration with Berslan Korkut, who will study the Archaic to Middle/Late Hellenistic amphorae as part of his doctoral research (Koç University, Istanbul).

43 Courtesy of John Bintliff and Anthony Snodgrass.

function, ware (e.g. LRC), fabric (e.g. PIT 051), shape (e.g. bowl), and type (e.g. Hayes Form 3F). Information about artefacts that were selected for more detailed (including visual) documentation was stored in Field Desktop[44].

24 The archaeological evidence for the manufacture of LRC at Pitane (cf. infra) specifically raises the important question where it needs to be placed chronologically. The surface ›context‹ from whence artefacts were collected does not offer any clue. Also, matters of methodology and interpretation urge to show restraint in using and applying the typology and chronology as originally set forth by Hayes, and which were discussed and amended by both Hayes and others. This restraint is in fact made clear by evidence from Ephesus, where vessels resembling LRC Hayes Form 3 (a shape that went out of fashion ca. 550–575) yet made in Ephesian Red Slip Ware occur in 7th-century contexts[45]. Whether or not this scenario also applied to Pitane requires stratigraphic excavations at the site and/or finds of LRC made in Pitane from well-stratified contexts at consumption sites.

Research at Çandarlı prior to the 2019–2020 Survey

25 Besides pottery production, Çandarlı/Pitane is archaeologically also well known for its Late Geometric/Early Archaic to Hellenistic necropoleis. These had been identified in the northern part of Pitane's isthmus, partially excavated in 1883 by Demosthenes Baltazzi[46], and systematically excavated by Ekrem Akurgal in 1958–1959 and 1964–1965[47]. Further burial structures that were identified during the »Kane Regional Harbour Survey« in 2017 (cf. supra) are located about 200 m east of Akurgal's excavations on the low, pine-covered hill north of the modern street which gives access to the peninsula[48]. These necropoleis hint at settlement activity on the peninsula and/or on the adjacent mainland that began in the 7th century B.C. Soon after their discovery, the first systematic and comprehensive research (a survey) was undertaken by Carl Schuchhardt, including a cartographic documentation which allowed him to produce the first overall plan of Pitane[49]. Based on Herodotus (Hdt. 1, 149–151) and Eduard Thrämer's interpretation of Strabo (Strab. 13, 1, 67), Schuchhardt argued that modern Çandarlı is the location of ancient Pitane, which nowadays is considered the communis opinio[50].

Loeschcke's Excavation

26 Schuchhardt along with Alexander Conze, were the first to observe dense scatters of pottery fragments with a shiny red slip in parts of a vineyard located in the central part of the peninsula. The vast number of sherds – which were immediately

44 Field Desktop is an open access tool for field documentation developed by the German Archaeological Institute <https://www.dainst.org/forschung/publikationen/datenpublikationen> (04.02.2024).

45 Waldner – Ladstätter 2014, 50.

46 The excavation is mentioned in Reinach 1891, 9; Bittel 1950, 12 f. fn. 1, but otherwise unpublished. Baltazzi (Baltazzi 1888) only published some thoughts on a horos stone found near Pitane (Baltazzi 1881) and some inscriptions from Aiolis.

47 Akurgal 1960; Boehringer 1959, 167 f. figs. 34. 35; Ustura 2006, 48 f. (on an Archaic kouros found in 1958); Bayburtluoğlu – Cook 1966 (painted sarcophagi); Freyer-Schauenburg 1973 (glass); Bakır 1984–1997 (satyr); Tuna-Nörling 1995 (black-painted pottery); Iren 2003 (Orientalising pottery). A plan of the necropoleis is published in: Iren 2003, app. A concise summary of the state of research can be found in Mohr 2015, 285–287 cat. 38.

48 Laufer 2020, colour pl. 19 (defined as UM17 Fst. 01).

49 Schuchhardt 1899, 144. 146; Schuchhardt 1912, 99 f.

50 Schuchhardt 1899, 144. 146; Schuchhardt 1912, 99 f., based on Thrämer 1888, 174. According to a different interpretation of Strabo as well as a supposed difference in the modern topography, Wilhelm Dörpfeld (Dörpfeld 1910, 395–399 fig. 10) situated Pitane further north, an interpretation on which doubt was cast and that was proven to be incorrect from geographical (Philippson 1911) and philological-historical (Schuchhardt 1912, 100) perspectives. Also see Heinle 2015, 71 fn. 467.

recognised as TS – incited both scholars to consider that a TS production site once functioned here. Fortunately, Siegfried Loeschcke, a TS specialist who had studied pottery from Haltern for his Doktorarbeit (doctoral/Ph.D. thesis)[51], visited Pergamon in 1911 on his sojourns which were supported by a travel grant from the German Archaeological Institute. In accordance with the representative of the Ottoman government, A. G. Sophianos, the Pergamon excavation motivated Loeschcke to conduct a small-scale excavation. This took place from 29 October until 5 November 1911, indeed in the vineyard to the east of the central part of the Çandarlı Peninsula – our Fst. 09. He published the results the very next year[52].

27 The main aim of these excavations was to find evidence in support of Schuchhardt's and Conze's idea about pottery manufacture in Pitane, and to document the locally manufactured repertoire. Loeschcke placed six rather small trenches on the upper of the three terraces upon which the vineyard was situated. The placement of these trenches was directed by the topography as well as the cultivation of the area, rather than archaeological observations. Rectangular trenches III–VI were situated in areas that were not cultivated, while circular trenches I–II in an area where the vines had withered[53]. Regrettably, Loeschcke's excavations did not reveal any structural/architectural evidence for pottery kilns. However, large amounts of over- and misfired pottery, as well as different kinds of stacking devices, formed compelling evidence for local TS production[54].

28 Of particular interest are Loeschcke's stratigraphic observations in relation to the relative chronology of pottery manufacture as well as the interpretation of distribution patterns which had been observed on the surface. In circular trench II, with a diameter of ca. 1.5 m, he documented a 30 to 60 cm thick layer, composed of very hard fired pottery fragments with a red or dark red, very shiny slip, interspersed with ash and clay. Below this layer and separated by a 10 to 20 cm thick earthy layer, he identified a second layer in which ash and clay were again interspersed with pottery fragments. This latter pottery, however, varied from that in the layer above not only in terms of slip (being more orange red) and firing (being less hard), but also in its typological repertoire. This stratigraphically earlier pottery continued to a depth of about 3 m, which is where Loeschcke uncovered a wall embedded in a layer that no longer contained any TS, but fragments with a shiny black slip instead. Furthermore, in rectangular trench III, Loeschcke encountered a »stattliche vorrömische Mauer von etwa 2,40 m Dicke, die mit zwei Steinmauern und Schotterfüllung errichtet war« (›imposing pre-Roman wall about 2.40 metres thick, built as double-shell stone masonry with rubble infill‹), which was embedded in layers without TS and contained mostly Hellenistic pottery instead, but upon which a TS-rich layer was again identified[55]. These latter observations are clear indications that the pottery workshops dumped their waste over the remains of an earlier building phase.

29 Furthermore, Loeschcke's observation that in trench II both stratified layers containing pottery production waste sloped downhill and superimposed a stony layer, can be tentatively interpreted that this waste was actually dumped down the slope[56]. The question whether it was dumped here straightaway or was first temporarily deposited in the vicinity of a workshop before being finally dumped here cannot be answered. The evidence unearthed in Loeschcke's trenches gives no clue for either scenario as to the location of the actual pottery workshop(s). His observation that the layers containing

51 Loeschcke 1909. For Siegfried Loeschcke's vita, see Gose 1957; Merten 2000; Merten 2013.
52 Loeschcke 1912.
53 Loeschcke 1912, 344–346 fig. 2.
54 Loeschcke 1912, 352–357 fig. 4.
55 Loeschcke 1912, 349.
56 Loeschcke 1912, 347 f.

the waste were also rich in ash and clay does indicate that the waste originated from workshops that were not too distant.

30 In any case, Loeschcke's research was groundbreaking for pottery research in the entire Mediterranean. Following the work by Hans Dragendorff[57] and Robert Zahn[58], who had pondered on production sites for different kinds of TS in the Eastern Mediterranean, the first such production site, for ESC[59] (not known under that name until Kathleen M. Kenyon's research[60]), had been identified. Loeschcke classified the TS repertoire produced in Pitane into 29 main types – Loeschcke Types 1 to 29 – which still provide much of the basis for the typology of ESC produced in the Pergamon micro-region. It is nonetheless important to note that when fully preserved specimens were lacking, Loeschcke's type drawings were in some cases reconstructed – e.g. the base of Type 25 – based on suggestions or on finds from elsewhere – e.g. Type 22, using comparable shapes from Pompeii[61]. Loeschcke's publication of the typology, including a description of clay, slip and production characteristics, was widely read and allowed researchers across the Mediterranean and Pontic areas to start identifying it, and to build upon Loeschcke's typology, as John Hayes for example did (cf. supra)[62].

31 Loeschcke left most of the finds in the vineyard, though did transfer a selection to the Bergama Museum, and brought selected pieces to Germany as comparanda[63]: some of these became part of the study collection of the Winckelmann Institute at the Humboldt University in Berlin, while the remainder was divided between the »Römisch-Germanischen Zentralmuseum« (RGZM)[64] in Mainz and the »Akademischen Kunstmuseum« in Bonn[65]. Recently, Fabian Sliwka restudied the 32 pottery fragments in the Berlin collection employing modern ceramological standards[66]. The 12 pottery fragments stored at the RGZM were restudied and published by Krzysztof Domżalski as part of the reassessment of Pitane's role as a pottery production centre[67]. The 163 pottery fragments and small finds (e.g. smoothening tools) that are stored and inventoried in the »Akademischen Kunstmuseum« in Bonn still await restudy[68].

32 Loeschcke's trenches in Pitane were explicitly regarded as a test excavation (»Versuchsgrabung«[69]), which implies that more extensive investigations were scheduled. This is shown by correspondence between Halil Edhem Bey, who at the time was director of the museum in Constantinople, and Conze, then head of the Pergamon excavation[70]. In his letter to Conze dated 31 August 1913[71], Halil Edhem Bey gave his consent for future research in Pitane; Halil Edhem Bey was aware of Loeschcke's research in 1911 as it was part of the preliminary excavation report concerning Pergamon, which

57 Dragendorff 1897, especially 141 f.

58 Zahn 1904, 430–449.

59 For a summary of the checkered history of the naming of the different kinds of Eastern Sigillata in general and that of ESC/Çandarlı Ware in particular, see Meyer-Schlichtmann 1988, 2–5; Engels et al. 2012, especially 252; Japp 2014, especially 12 f.

60 Kenyon 1957, 281–283.

61 Loeschcke 1912, 371. 373. Using the material stored at the Winckelmann Institute Sliwka 2020, 96 ascertained that the profile drawings in Loeschcke 1912 are very reliable and his reconstructions plausible.

62 For the difficulties of allocating fragments to the Pitane/Çandarlı production site, due to macroscopic similarities with ESC produced elsewhere within the Pergamon micro-region, see Engels et al. 2012, 253; Japp 2014, especially 13–15. A precise allocation to Pitane/Çandarlı can only be done through archaeometric analysis: Japp 2009, 209; Mommsen – Japp 2009; Schneider – Japp 2009, 294–296.

63 For the legal circumstances of this transfer, see Sliwka 2023.

64 Nowadays the »Leibniz-Zentrum für Archäologie« (LEIZA).

65 Loeschcke 1912, 360 fn. 2.

66 Sliwka 2020; Sliwka 2023.

67 Domżalski 2014.

68 Akademisches Kunstmuseum Inv. 2063, 1–152 and 2063a, according to Sliwka 2023, 150 fn. 30.

69 Loeschcke 1912, 345.

70 Sliwka 2023, 150.

71 Accessible in the archives of the Staatlichen Museen zu Berlin (SMB).

Conze had sent him[72]. Most probably, the outbreak of the First World War in 1914 and the subsequent interruption of archaeological excavations in Pergamon until 1927 thwarted these plans[73].

The 1980s French Survey Project and Archaeometric Analyses

33 Not until the 1980s did Pitane come into focus of ceramic researchers once again: a French survey project conducted by Jean-Yves Empereur and Maurice Picon collected pottery from several sites in Ionia and Aiolis (Phokaia, Kyme, Myrina, Gryneion, Elaia and Pitane) for archaeometric analysis, in order to test the hypothesis that ESC and LRC were manufactured at multiple sites, and to determine their chemical fingerprints. This project yielded not only evidence for a (minor?) production of LRC in Gryneion (besides the supposed major production at Phokaia), but also provided the first chemical fingerprint of ESC produced in Pitane[74]. A visit by Octavian Bounegru to Pitane in 1993 did not shed any substantial new light on local ESC production[75]. Further pottery that had been collected at Pitane was analysed within the framework of a large-scale archaeometric project undertaken by the Pergamon excavation, which was coordinated by Sarah Japp in collaboration with Gerwulf Schneider and Hans Mommsen. Employing XRF as well as NAA, these analyses resulted in well-defined chemical groups for Pitane, amongst others, which can be chemically distinguished from other groups that can be associated with the Pergamon micro-region, such as the production in the Ketios Valley[76]. Another interesting result was the indication for LRC production in both Pitane and the Ketios Valley, based on the analyses of artefacts from the region[77]. In 1972, Hayes already suspected the manufacture of LRC-style vessels at Pitane based on his study of ESC and LRC from Athens[78], and these laboratory results offered the first real clue for LRC manufacture within the Pergamon micro-region[79].

The 2015 and 2017 Archaeological and Geophysical Research

34 In 2015 and 2017, archaeological investigations at Pitane were resumed as part of the »Kane Regional Harbour Survey«, a regional survey aimed at documenting the maritime topography of the Kane Peninsula[80]. In 2015, large-scale geophysical prospections (geomagnetics and georadar, cf. infra) and a targeted ceramic survey were carried out at the formal archaeological zone of Pitane. This encompassed not only the area where our team subsequently carried out an intensive survey, but also the area where Loeschcke excavated in 1911. The ceramic survey achieved relatively limited results, as finds had to be processed in the field following temporary regulations issued by the Turkish Antiquities Administration. Therefore, its initial evaluation did not produce anything fundamentally new: few Classical and Hellenistic finds, large quantities of

72 SMB-ZA/ANT, P 108; Sliwka 2023, 150.

73 Sliwka 2023, 150 f. fn. 34.

74 Empereur – Picon 1986; Mayet – Picon 1986.

75 Bounegru 1996.

76 Japp 2009, for Pitane see 209; Schneider – Japp 2009, for Pitane see 294–296. For the chemical distinction between Pitane and the Ketios Valley, see Mommsen – Japp 2009.

77 Japp 2009, 206 »Gruppe 2« Perga 113; also see Schneider – Japp 2009, 295 tab. 2.

78 Hayes 1972, 322. 331. 333. 369. Hayes suggested that the following specimens of LRC originated from Pitane: no. 1, Form 3B (Athenian Agora cat. P 7636); no. 7, Form 3C (cat. P 8650); no. 17, Form 3F (cat. P 9658); and the specimens he classified as Form 3H.

79 Engels et al. 2012, 253 fn. 195; Japp et al. 2013; Japp 2014, 21 fn. 68. The final publication of results of a second series of archaeometrical analyses selected by Sarah Japp is scheduled for the near future.

80 The project »The Maritime Topography of the Ancient Kane Peninsula. A Micro-Regional Approach to the Impact of Harbours and Anchorages on Politics, Economy and Communication of a Western Anatolian Landscape. Kane Regional Harbour Survey«, conducted by Erik Laufer and Stefan Feuser and under the direction of Felix Pirson, was part of the research network »Portus Limen – Rome's Mediterranean Ports«. For preliminary reports see Laufer 2015; Laufer 2016; Feuser – Laufer 2018. For a summary of the results see Laufer 2020.

pottery manufacturing waste, a predominance of locally produced TS datable to the 1st and 2nd centuries, and some LRC fragments. The latter were tentatively seen to indicate a continuation of pottery production after the 3rd century. This initial survey was nevertheless crucial in that it provided a starting point for the survey in 2019–2020[81].

35 The 2015 and 2017 geomagnetic and georadar surveys were carried out by Sophie Hay, Stephen Kay and Eleanor Maw (University of Southampton/The British School at Rome)[82]. The geomagnetic survey in 2015 resulted in limited indications for (ceramic) kilns which were so eagerly expected. Besides anomalies at the southern end of the prospected area, which were interpreted as indications for domestic structures[83], »[o]ne positive anomaly [...] does warrant note«, which »[w]ithin the results [...] is the only obvious candidate for interpretation as a kiln«[84]. Based on the results of the magnetic survey, two smaller areas were prospected with georadar in 2017[85], which confirmed the presence of a roughly circular anomaly of approximately 4 m in diameter in the northeast corner of the central olive grove (UM15 Fst. 06/UM19 Fst. 01), which hypothetically can be interpreted as evidence of the remains of a (ceramic) kiln. The lack of geophysical evidence for further pottery kilns in this area could also be caused by the volcanic geology which hampers geomagnetic prospection[86]. The results of georadar measurements around the courtyard of the old school of Ada Mahallesi, located approximately 120 m further south, indicate densely spaced (domestic) structures[87]. This can tentatively be brought into connection with a large courtyard house complex with a similar orientation, which was uncovered just below the surface during emergency excavations by the Bergama Museum in 2015 south of the survey area. Unfortunately, it is currently not possible to determine the date of this courtyard house[88]. Although the geophysical prospection did not provide convincing information about the location of ceramic kilns, as was anticipated, it did provide important information regarding the surrounding area, which was probably dominated by domestic structures.

Thoughts on Other Categories Manufactured at Pitane/Çandarlı

36 The question, whether ceramic categories other than ESC and LRC were manufactured at Pitane concerns three subquestions: [1] are there indications for other tableware or other functional ceramic categories being produced in Pitane contemporaneously with ESC and/or LRC?; [2] are there data that hint at a (Late) Hellenistic production phase, perhaps a forerunner of ESC/LRC production?; and [3] What is the current state of research concerning the pottery of Geometric and Archaic date – well attested in the necropoleis of Pitane – in connection with local pottery production? In the following, we will consider these questions in chronological order.

37 The purposes of this excursus, an introduction of sorts regarding the topic of (local) pottery production more generally, is to bring this information together, to

81 The results of the ceramic survey (Laufer 2016, 182–184 figs. 54. 55) are based on observations and documentation of ceramic finds in the field by Madlen Ernst.

82 Hay et al. 2016; Hay – Kay 2017.

83 Laufer 2016, 181 f. fig. 53.

84 Hay et al. 2016, 10 fig. 6.

85 Feuser – Laufer 2018, 158 fig. 63.

86 Hay et al. 2016, 9. 13.

87 Feuser – Laufer 2018, 158. 161 fig. 63.

88 This complex in the Orta Sokak was recorded in 2015 by Erik Laufer and Bernhard Ludwig as UM15 Fst. 15, with the permission of the director of the Bergama Museum, Nilgün Ustura, and documented with aerial photography; see Feuser – Laufer 2018, 161; Laufer 2020, 227.

explore potential long-term artisanal and economic patterns, and to provide a context for the emergence of pottery manufacture at Pitane, albeit one that is tentative.

Pottery Manufacture during Geometric and/or Archaic Times?

38 The provenience of painted Geometric and Archaic pottery in the Aiolis is a lively debate, particularly during the last decades[89]. Especially various groups of Eastern Greek painted pottery in the animal frieze style, which can be distinguished from Ionic groups, have mostly been attributed to Aiolis, however, without convincing evidence such as workshops, vessel wasters and/or archaeometric analyses[90]. For example, ideas about the location of the workshops of the so-called London Dinos Group, are highly controversial[91], though this is relevant for the question of the beginnings of pottery production in the Pergamene region, as Pitane was long regarded as a potential production site for such dinoi[92]. This assumption was based on the hypothesis that different stylistic groups of Archaic painted pottery could be assigned to specific centres in Aiolis and in northern Ionia, e.g. Phokaia[93]. The excavation of an Archaic pottery workshop in Phokaia by Ömer Özyiğit (2002) in fact provided archaeological evidence[94]. Archaeometric analyses of Archaic pottery from Naukratis, where the largest collection of Aiolian Archaic pottery outside the Eastern Aegean has been found, showed that pottery of various stylistic groups of the animal frieze style, including the London Dinos Group, as well as groups with simpler styles such as the so-called dot-style group, belong to the same NAA provenance group G and subgroup g[95]. A large number of samples (n=56) of Archaic pottery and misfired pieces from Phokaia, datable to the Roman Imperial to Late Antique period revealed various chemical signatures which deviate from provenance group G/g, which implies that Phokaia cannot be considered as the origin of group G/g[96]. However, NAA of Archaic pottery from Kyme and Larissa showed that a large proportion does belong to provenance group G/g, which is also prevalent in Naukratis. Even if no misfired fragments have been identified at either of these sites, it seems plausible that the production of the main group of Aiolian Archaic painted pottery was located in Kyme, with a smaller production in Larissa, thus within Aiolis[97]. The previous attribution of the London Dinos Group to Pitane has thus been abandoned in favour of Kyme/Larissa, which presently also means that pottery production in Pitane during the Geometric and Archaic periods is no longer assumed. Ultimately, only archaeometric analyses and/or primary archaeological evidence can either confirm or

89 On the archaeometric and archaeological investigations of Mycenaean, Geometric and Archaic pottery from sites in Western Asia Minor as part of the project »Töpferzentren der Ostägäis«, see Akurgal et al. 2002. Aytaçlar 2007 discusses the problem of differentiating between Archaic pottery from northern Ionia and the Aiolis and their respective production centres by means of archaeometric analyses. On the regional styles of 7th century B.C. Eastern Greek workshops, see Kerschner 2017.

90 Iren 2002, 165 aptly describes these groups as »pseudo-Aiolic«.

91 The London Dinos Group, a group of small-sized dinoi painted in the animal frieze style, which were grouped around the eponymous London Dinos on the basis of typological similarities and an analogous painting style, was first defined by Ernst Homann-Wedeking (Homann-Wedeking 1938, 17). Since then, a growing number of vessels is being assigned to this group, in particular by Robert Cook (Cook – Dupont 1998), who finally established the name of this group, and most recently by Kaan Iren (Iren 2002).

92 During the excavation of the Archaic necropolis in Pitane by Ekrem Akurgal (Akurgal 1960), various painted Archaic vessels came to light (Iren 2003). Various researchers, for example Karl Schefold, whose work on the finds from Larissa still forms the basis for research into painted pottery of Aiolis (Boehlau – Schefold 1942), interpreted these finds as products of local workshops.

93 The assumption that Phokaia was the leading production centre for painted Archaic pottery can be found, for example, in Schefold 1942, 132 and is based on the assumption that Phokaia was particularly advanced. This assumption was contradicted by Cook and Dupont (Dupont 1983, 22 f.; Cook – Dupont 1998, 56 f.) on the basis of research of the fabrics of painted pottery and preliminary archaeometric analyses.

94 Özyiğit 2003, 443 f.

95 Kerschner 2006, 111–113.

96 Kerschner 2006, 113 f. 118. 125 f. figs. 32. 33.

97 Kerschner 2006, 115–117. 123 figs. 12. 13; 124 figs. 14–22; 125 figs. 23–25; 126 fig. 34.

invalidate the hypothesis that pottery was manufactured in Pitane during these periods. It will therefore be particularly worthwhile to compare previous laboratory results with those obtained from the Pitane Survey.

(Late) Hellenistic Pottery Manufacture?

39 Evidence for (Late) Hellenistic pottery production in Pitane is limited and ambiguous. Loeschcke published a single clay mould for a handle, three clay moulds for appliqués, and a patrix of a small clay relief (the positive for making a hollow mould, also used in the production of appliqués)[98]:

1. A mould (matrix) for a relief-decorated pan handle of Loeschcke Type 40[99]. A similar handle was identified in the Palaimonion at Isthmia[100];
2. A mould (matrix) for a head of Silenus or Pan with stringy hair[101]. Such appliqués belong to the repertoire of Pergamene »Applikenware« (›Appliqué Ware‹) and were applied on the exterior of drinking vessels[102]. A similar mould, albeit one which differs in detail, is known from the excavations in the 1970s to 1990s in the domestic area of the so-called Philetairia of Pergamon[103]. Pergamene »Applikenware« is dated from the end of the 2nd century B.C. till the mid-1st century A.D. – the mould discussed here presumably belongs to the »Spätphase« (›late phase‹) dated to 130–60 B.C.[104];
3. A mould (matrix) for a comic mask, from a private collection in Çandarlı[105]. Such appliqués are also attested among the repertoire of Pergamene »Applikenware« (cf. infra). The absence of a description or illustration means that no further conclusions can be drawn;
4. A mould (matrix) for a symplegma scene, from a private collection in Çandarlı[106]. Similar symplegmata are well known among Pergamene »Applikenware«[107] and occur in deposits dated to the 1st century B.C., for example in the Grotto Sanctuary, where it is found on a drinking vessel with another symplegma also attested in Çandarlı (no. 5 below);
5. A mould (patrix) of a symplegma, from a private collection in Çandarlı[108], in a configuration which is also well known among Pergamene »Applikenware«[109] in deposits of the 1st century B.C., for example in the Grotto Sanctuary (also see no. 4 above)[110].

40 It is nevertheless important to emphasise that some of these moulds did not originate from Loeschcke's excavations, but belonged to private collections in Çandarlı at that time and were seen and sketched or photographed by him there. Whether mould

98 Loeschcke 1912, 356. 385 f. pl. 30.

99 Loeschcke 1912, 356 pl. 30, 3, found in trench III. This rather resembles a mould for the production of stem handles as known from Sagalassos: see Poblome 1999, 179 f. 429 fig. 84.

100 Hayes – Slane 2022, 169 fig. 70 cat. P52.

101 Loeschcke 1912, 385 pl. 30, 2. From a private collection in Çandarlı(?).

102 For head appliqués within Pergamene »Applikenware«: Hübner 1993, 76–80. For a similar head appliqué of Silenus or Pan, see Hübner 1993, 39–50. 188 cat. 36 pl. 5.

103 Hübner 1993, 186 cat. 33 pl. 5.

104 Hübner 1993, 76. 181. For a critical examination of Hübner's date ranges, in particular the beginning which Hübner placed as early as 170 B.C., see Rotroff – Oliver 2003, 153 f.

105 Loeschcke 1912, 385.

106 Loeschcke 1912, 385 fig. 8.

107 Hübner 1993, 96. 102. 106. 194 cat. 143 pl. 29; Schäfer 1968, 97 cat. E 44–46 pl. 30; Rotroff – Oliver 2003, 163 cat. 697 pl. 121.

108 Loeschcke 1912, 385 fig. 8.

109 Hübner 1993, 96. 102. 106. 195 cat. 153 pl. 31; Schäfer 1968, 97 cat. E 25. E 28 pls. 27. 28; Rotroff – Oliver 2003, 162 cat. 690 pl. 119.

110 Engels 2021, 226 pl. 89 cat. K 24. Another specimen was found in the so-called banqueting house on the East Slope of Pergamon (Inv. PE10 KF 115 (PE10 Ar 04, 017)), which Nicole Neuenfeld will publish in her Ph.D. thesis (University of Leipzig).

no. 2 was found in his excavations or that it also belonged to a private collection is not stated. According to Loeschcke, the matrices and patrix in the private collections were probably found in the vineyard where he had excavated – only concerning the symplegma patrix (no. 5) he writes that, according to a reliable testimony, it came from the layer which contained the earlier ESC[111].

41 Mould no. 1 does not necessarily indicate pottery manufacture at Pitane during the Hellenistic period, since there is too little information on this pan type in general, and the handle mould in particular. Not only is it uncertain whether it can be associated with a pan, it is also not possible to draw conclusions about the production of pans in Pitane. While Loeschcke was convinced that mould nos. 2–4 and actual fragments of appliqué-decorated pottery almost certainly meant that »Applikenware« was manufactured in Pitane, he did admit that he had not found matching wasters or mis- or overfired fragments[112]. In consideration of the fact that moulds and patrices have been found in settlement contexts both in Pergamon[113] and elsewhere[114], the moulds found in Pitane do not suffice to argue for the production of »Applikenware«, and thus for (Late) Hellenistic pottery production, in Pitane.

42 Another Hellenistic ceramic category which is thought to have been made in Pitane are White-Ground Lagynoi, based on White-Ground Lagynoi found in the Antikythera shipwreck[115]. In the course of the wreck's reconsideration in the 1960s, Roger Edwards revisited the Hellenistic pottery and while noting that there was evidence that at least some of the white-grounded lagynoi had been produced in Pitane and Pergamon, he did not explain what evidence brought him to this conclusion[116]. The most recent publication discussing the lagynoi from the wreck considers that the provenance of the white-ground lagynoi, all of which belong to Westholm Type II, lies in the eastern part of the Hellenistic world – the coasts of Asia Minor and Cyprus[117]. As there seems to be no evidence to narrow down their provenance to the Pergamene region, let alone an attribution to pottery workshops in Pitane, Edward's hypothesis must remain shelved.

43 Meanwhile, the first indications of Hellenistic pottery production resulted from the series of analyses which pointed to local LRC manufacture as well (cf. supra). Among the samples selected by Gioia de Luca as part of her research into the manufacture of Pergamene mouldmade bowls are two samples which, according to archaeometric analyses, fall into Schneider's XRF Group 2, which is characterised by a higher amount of Ca (calcium) and was, following further analyses, attributed to Pitane[118].

1. De Luca's »Tonprobe« (TP; ›clay sample‹) 11 concerns a mould (matrix) fragment for making mouldmade bowls, excavated on the City Hill of Pergamon in 1977[119], and is dated to the second third of the 2nd century B.C.;
2. De Luca's »Tonprobe« (TP) 2 concerns the lower part of a mouldmade bowl with unknown find circumstances[120], and is dated to the second third of the 2nd century B.C.

111 Loeschcke 1912, 385 f.

112 Loeschcke 1912, 386.

113 For example, a patrix for making appliqués, depicting a symplegma scene, was found in Building T at the East Slope of Pergamon (Pirson 2008, 93 fig. 11), which will be included in the Ph.D. thesis of Anneke Keweloh-Kaletta.

114 Groh et al. 2013, 134 pl. 2 nos. 40. 41, listing 5 moulds for mouldmade/Megarian bowls that were found during a survey of the upper city of Ephesus.

115 For recent research and accompanying bibliography, see Bignasca et al. 2015. The original dating between 80–50 B.C. (more probable in the earlier part of this timespan), was based on amphorae (Virginia Grace), Hellenistic pottery (Roger Edwards) and Roman pottery (Henry S. Robinson): see Weinberg et al. 1965.

116 Edwards 1965, 19.

117 Vivliodetis 2015, 168 f.

118 De Luca 2021, 17 f.; Japp 2021, 178 f.; Schneider 2021, 177.

119 De Luca 2021, 193. 231 cat. 98 pl. 17.

120 De Luca 2021, 236 cat. 496 pl. 87.

44 Both samples share significant details of their relief decoration with mould-made bowl fragments which are attributed to Schneider's XRF Group 1 that, based on archaeometric analyses, is ascribed to the Ketios Valley[121]. Furthermore, Japp points out that archaeometric analyses allow attributing other Hellenistic categories to Pitane, for example vessels with West Slope decoration[122].

Pottery Manufacture Contemporary with ESC and/or LRC?

45 Loeschcke also found plain pottery, for example large storage vessels such as lekanai, in smaller quantities[123]. These deep lekanai (Types 41–42) have a flat bottom and a steep, slightly outturned wall, and either an outturned (Type 41) or a horizontal rim (Type 42). Some have two or more wavy lines incised upon the rim – which can also occur on the exterior wall[124] – or are equipped with single horizontal handles on opposite sides attached below the rim. Since these types occur as a plain variant or with a red to brown slip on the interior and upper rim, Loeschcke regarded Types 41–42 as shapes with hybrid attributes which connected TS and coarse ware[125]. Several observations prompted Loeschcke to suggest a local production for both the partially slipped and the plain variant: perhaps most convincing were two specimens of the plain version of Loeschcke Type 42 that had fused during firing, which were found in trench III[126]. There is no opportunity to check this since this fused stack was neither depicted nor is known to be part of one of the collections in Germany. Either way, this artefact provides meagre yet tantalising evidence to entertain the idea of local production of such vessels. The other arguments Loeschcke put forward – the occurrence of lekanai in layers with TS (in some cases types that are morphologically close) and the high proportion of such vessel fragments on the surface in the eastern part of the peninsula – also should not be regarded as conclusive evidence for the local manufacture of plain ware[127]. The 2019–2020 survey was not able to shed further light on this topic.

46 Unfortunately, Loeschcke did not illustrate Type 41, while the profile drawing of Type 42 appears to depict just one kind of lekanai he described. From his description, both the fragments which Sliwka recorded at the Winckelmann Institute in Berlin[128] as well as our observations during the survey, it is plausible that Loeschcke was confronted by a lack of published parallels (whether plain or (semi-)slipped). His Types 41 and 42 are in fact three rather different types of deep bowls:

1. Type 41: a deep, partially slipped lekane with outturned horizontal rim and horizontal handles, slipped on the upper rim and the interior. Different variants occur in Pergamon in contexts of the 2nd–1st centuries B.C.[129];
2. Type 42[130]: a deep, plain lekane in a coarse fabric with a horizontal rim and two or more grooves on the upper rim, sometimes having a light cream-coloured slip. The shape is well-known from Hellenistic and Roman Imperial

121 Schneider 2021, 18.

122 Japp 2021, 178 f.

123 Loeschcke 1912, 352. 389.

124 Loeschcke 1912, 386–388.

125 Loeschcke 1912, 388.

126 Loeschcke 1912, 389.

127 Loeschcke 1912, 389 f.

128 Sliwka 2020, 141–147 cat. 26. 32 pls. 38–46.

129 Represented by a fragment among Loeschcke's material kept at the Winckelmann Institute in Berlin: Sliwka 2020, 26 cat. 26. Comparable to: Engels 2021, 96 f. (Type P1–P2). 279 (K 413). 280 (K 414–453) (Pergamon, Grotto Sanctuary); De Luca – Radt 1999, 28 (cat. 104). 48 (cat. 235) (Pergamon Altar); Nohlen – Radt 1978, 43 cat. K 101 pl. 31 (Kapıkaya).

130 As depicted in Loeschcke 1912, pl. 28.

assemblages in Pergamon, and can be dated from the 2nd century B.C. to the early 1st century A.D.[131];

3. Type 42[132]: a deep, plain lekane in a gritty fabric with a horizontal rim and incised wavy lines on the upper rim. Based on observations made during the 2019–2021 survey, specimens can have a light cream-coloured to yellowish slip. Generally dated by contextual evidence from the 3rd/4th to the 5th/6th centuries[133].

47 Concerning groups 1–2, their fabric and surface finish led to the conclusion that both date to the Hellenistic period, which was sparsely represented across the 2019–2020 research area. Criteria to exclude all three from the locally-manufactured repertoire at Pitane are: (1) the absence of specimens that are misfired or show firing defects; and (2) obvious differences from macroscopic fabric groups which are regarded as local in terms of surface treatment and clay attributes. Type- and fabric-wise, the third group – as identified among the 2019–2020 Pitane material – strongly resembles lekanai that were collected during the survey of Elaia between 2006–2012. Over- or misfired specimens of such lekanai were found to the west of Elaia's acropolis, together with kiln slags and a waster resembling a Late Roman Amphora 13 (LRA 13)[134]. The spatial association of these lekanai wasters with LRC (especially Hayes Form 3), combined with the location of potential pottery kilns next to the acropolis in Elaia, led Güler Ateş to ponder upon a date for these lekanai in the 5th–6th centuries, this being Elaia's last phase during which the settlement area shrank significantly. This chronology is supported by parallels from stratified contexts from Ephesus and Samos as well as parallels from Miletus referred to earlier (cf. supra)[135]. In order to enhance understanding of the distribution of pottery produced at different workshops within the Pergamene microregion, it is desirable to compare the lekanai fragments from Pitane with those collected at Elaia.

48 Given the present state of knowledge, the question of production before the 1st century in Pitane can neither be verified nor ruled out, though archaeometric analyses somewhat speak in favour of this idea. However, as Japp emphasised, the existence of another workshop in the Pergamon region that has the same chemical fingerprint cannot be ruled out[136]. Thus, besides indications for pottery production at Pitane during the (Late) Hellenistic period based on archaeometric analyses conducted by Japp in recent years[137], currently there is no indisputable evidence for pottery production at Pitane other than ESC and LRC.

The 2019–2020 Survey

49 Few production sites of TS and RSW have been comprehensively investigated particularly in the Roman Eastern Mediterranean (which here includes the Aegean).

131 Loeschcke 1912, 387 pl. 28. Comparable to: Engels 2021, 101 (Type P3). 285 f. (K 461–468) pls. 61. 62 (Pergamon, Grotto Sanctuary); De Luca – Radt 1999, 28 (cat. 105) (Pergamon Altar); Boehringer – Krauss 1937, 118 no. 4. 11 pl. 55 c fig. 39, 1 (Temenos for the Emperor's Cult). For a dating in the Roman Imperial period, see for example Wintermeyer 2004, 56 cat. 498 (Didyma, Type S 2.9); Pülz 1987, 43 f. (cat. 63–66). 60 f. figs. 20. 21 (Miletus, Early Imperial Context).

132 Such as described by Loeschcke 1912, 387.

133 Ephesus: Gassner 1997, 164–166 cat. 664–674 (pointing out that particularly lekanai with an angular thickened rim can be assigned to the 5th–6th centuries); Miletos: Berndt 2003, 98 cat. Schü 294–299 (referring to the production of similar bowls in Apollonia in the late 6th/early 7th century and to contexts from Cosa of the 4th–5th centuries); Didyma: Lüdorf 2006, 72; Samos: Isler 1969, 209 f. cat. 3827–3832 figs. 14–19 (two coins of Justinian offer a terminus post quem of 538 for the filling of the ›cistern‹).

134 Pirson 2008, 140; Ateş 2017; Ateş 2018, 124 f. fig. 6.

135 Ateş 2018, 125.

136 Japp 2021, 178 f.; also Schneider 2021, 177.

137 Japp 2021, 178 f.

There is a growing realisation that the picture of a few large-scale manufacturers who met most if not all tableware requirements, which was current for much of the 20th century, no longer holds true. In hindsight, the discovery at Sagalassos in the late 1980s of evidence for local TS/RSW production can be appreciated as a watershed. As a matter of fact, Sagalassos is currently the most comprehensively studied TS/RSW production site in the Roman Eastern Mediterranean. Sagalassos is significant, amongst others, for it challenged existing views on TS/RSW manufacture: here was a relatively small polis, located in mountainous terrain, at considerable distance from the coast, and yet succeeded in producing Sagalassos Red Slip Ware (SRSW) throughout the Roman Imperial to Late Antique periods. The workshops manufacturing SRSW catered for many of the communities within its territory (including Sagalassos proper), to a more limited extent also beyond[138], and occasionally SRSW even turns up at far-flung places[139]. The archaeological reality is, however, that TS/RSW production sites remain poorly investigated and thus understood, particularly in the Roman East. Arguably the most striking example is Eastern Sigillata A (ESA), which presumably was manufactured in the tens of millions[140], yet for which not a single shred of primary archaeological evidence has been found, and even its area of production can only be approximated using ceramological and archaeometrical clues. Other production sites of smaller and larger categories of TS and RSW – e.g. Eastern Sigillata B – also remain to be discovered, and when evidence was found it was generally insufficiently published[141]. It is against this background that the survey at Çandarlı offered a rare opportunity for a detailed documentation of local TS/RSW manufacture, allowing to improve understanding regarding repertoire and decoration, chronology, manufacturing and firing techniques, and regional contextualisation.

Artefactual Evidence for the Local Manufacture of ESC and LRC

50 Prior to discussing the repertoire of fabrics and vessel types that are considered to represent the local ESC and LRC manufacture at Pitane, one must take a first look at the artefactual evidence that attests that manufacture. Such evidence has been published previously[142], albeit sometimes slim, and of course partly merited the 2019–2020 survey. Evidence for TS/RSW manufacture is abundantly scattered across the survey zone, though differences were observed regarding spatial, quantitative, typological, and chronological composition and spread. The well-worn trope in survey archaeology of the absence of stratigraphic control naturally hampers interpretation here too. That said, careful observations regarding a range of macroscopic and fabric properties, such as the documentation of manufacturing and firing defects, permits a diachronic albeit inevitably incomplete interpretation of the area (Fig. 9). The following artefact categories that attest local TS/RSW production were distinguished and are organised according to consecutive stages of pottery making and firing processes, excluding raw clay extraction and preparation. The precise purpose of some categories nonetheless remains tentative.

138 Bes 2022, 20–22.

139 For instance, fragments of an SRSW dish were found at Caesarea Maritima; pers. obs. by the first author, courtesy of the Caesarea City and Port Exploration Project (CCPEP) directed by Joseph L. Rife (Vanderbilt University, Nashville, USA) and Peter Gendelman (Israel Antiquities Authority).

140 Lund 2005, 239 f.

141 Jackson et al. 2012.

142 ESC: Loeschcke 1912; LRC: Japp 2009.

Fig. 9: From left to right, a selection of artefacts representing the chaîne opératoire of local TS/RSW manufacture

9

- **Pre-firing** – moulds; wheel heads, kick wheels and/or bats; shaping or polishing tools (?); manufacturing defects and repairs
- **Vessel stacking and firing** – spacer discs; stacking devices; kiln slag; kiln lining
- **Post-firing: defects and discards** – vessel wasters, including partly preserved fused stacks of vessels; other firing defects

51 One may object that not all ontological choices are mutually exclusive, for example, that kiln slag was discarded after the unloading of the kiln, and thus should be grouped under post-firing. However, these objects came into being during the firing process and thus have been classified accordingly. The same can be said about vessel wasters and other firing defects, yet, classifying these with post-firing reflects an attempt to understand selection criteria (cf. infra).

Pre-Firing Stages

52 Rather few artefacts were identified and collected that give evidence of the actual manufacture of vessels. In fact, the attribution of several categories must remain tentative and/or ambiguous as other interpretations are possible.

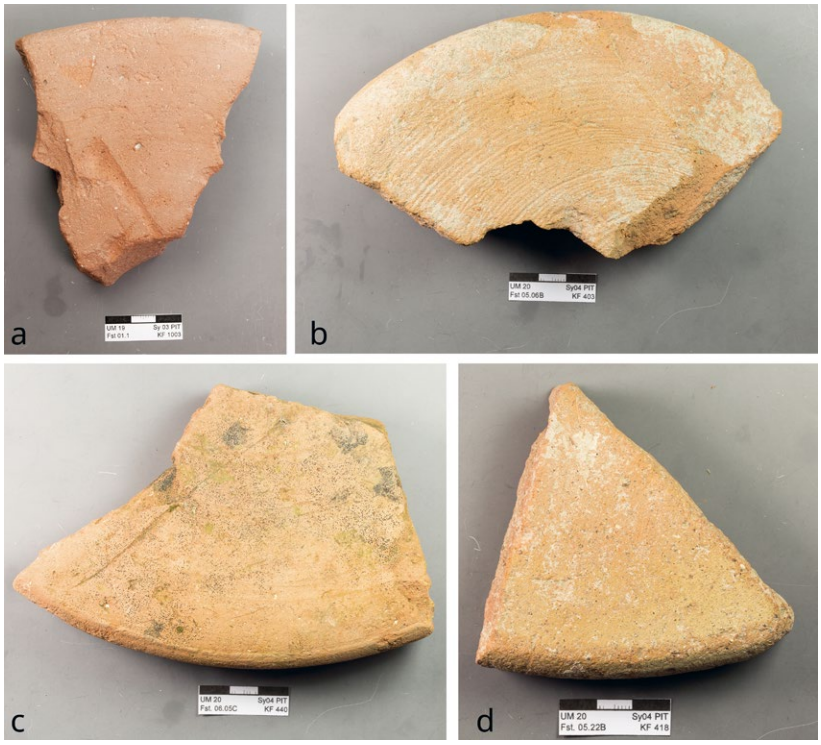
Moulds

53 Three mould fragments have been identified (cf. supra, concerning the moulds published by Loeschcke). Two further fragments remain dubious because of their worn condition: one is either a mould or figurine fragment, the other either a mould fragment or perhaps some sort of tool. Thus, four, possibly all five fragments were used for manufacturing figurines (Fig. 10). Their relation to local TS/RSW production remains unclear. Perhaps the production of mouldmade figurines was an ancillary activity as resources and an infrastructure were already available. Whether figurines were also marketed or for mere use within the workshops, reflecting a religious dimension of artisanal life, remains unclear. Nonetheless, Pitane does not appear to have been an isolated example regarding the production of figurines being tied in with the manufacture of other ceramic categories, or at least the attestation of figurines among the archaeological residue of ceramic workshops[143].

143 E.g. Augusta Trajana/Stara Zagora: Kalcev 1991; Nicopolis ad Istrum: Sultov 1985; Falerii: Biella – Michetti 2017; Verona: Cavalieri Manasse et al. 2016, 69 fig. 14.

10

Fig. 10: Two mould fragments for the manufacture of figurines; the fragment on the right possibly has several Greek characters within the frame at the bottom. (a) Inv. UM19 Fst. 01.01 KF 754; (b) Inv. UM20 Fst. 07.27B KF 436



11

Fig. 11: Fragments of possible wheel heads, kick wheels and/or bats. (a) Inv. UM19 Fst. 01.01 KF 1003; (b) Inv. UM20 Fst. 05.06B KF 403; (c) Inv. UM20 Fst. 06.05C KF 440; (d) Inv. UM20 Fst. 05.22B KF 418

Wheel Heads, Kick Wheels and/or Bats

54 Ten fragments of objects of apparent circular or discoid shape were found (Fig. 11). Their exact purpose(s) remain(s) unknown; for instance, they could have been lids for larger storage vessels. They are, however, tentatively interpreted as parts of wheel heads on which the actual vessels were turned and/or parts of kick wheels which were kicked with a foot or rotated in other ways in order to obtain rotational force. Another possibility is that unfired vessels were moved while resting on such a disc[144]. This spin was then transferred to the wheel head by means of a vertical axis onto which both wheels were fixed. None of these fragments shows any trace of how they may have been fixed that could support this hypothesis. That said, all ten fragments are rims, which need not preserve those elements with which a wheel or bat was fixed. A bat is a flat object or disc that can be fixed to the wheel head, and it was on a bat that

144 Cavalieri Manasse et al. 2016, 64 fig. 5.

Fig. 12: Possible shaping and polishing tools. (a) Inv. UM19 Fst. 01.09 KF 743; (b) Inv. UM19 Fst. 01.01 KF 1022; (c) Inv. UM20 Fst. 05.04C KF 3; (d) Inv. UM19 Fst. 01.01 KF 709; (e) Inv. UM19 Fst. 01.12D KF 771; (f) Inv. UM19 Fst. 02.17 KF 1447

12

vessels would be turned. Instead of removing the vessel from the wheel head, for instance by string-cutting, the bat with the vessel was removed and put aside for drying.

Shaping and Polishing Tools (?)

55 Already during the survey of Fst. 01, several amorphous, heavily rounded and smooth pottery fragments were collected. Some are reminiscent of the kind of sherds one can find on the beach, and exposure to running water can indeed explain their smooth surface as well as the shape of a number of these. Small numbers of similar fragments were identified in most other Fst. There appear to be two basic shapes (Fig. 12): [1] flat ones, having two or three rounded edges, or with a curved rounded edge all around, which appear to have been made from body sherds (Fig. 12 a–c). One hypothesis is that these were used as vessel-shaping tools. Similarly-shaped objects from Sagalassos were interpreted as »potters' ribs« or »potters' rib (scraper) tools«, and also occur in metal[145]; and [2] thicker, elongated ones, some of which taper, with rounded and smoothed edges and surfaces all around (Fig. 12 d–f). Originally, (some of) these may have been fragments of amphora handles, for instance. They have been interpreted as polishing tools in relation to pottery manufacture[146], which cannot be ruled out but is certainly more ambiguous, not in the least because of their more generic morphological character[147].

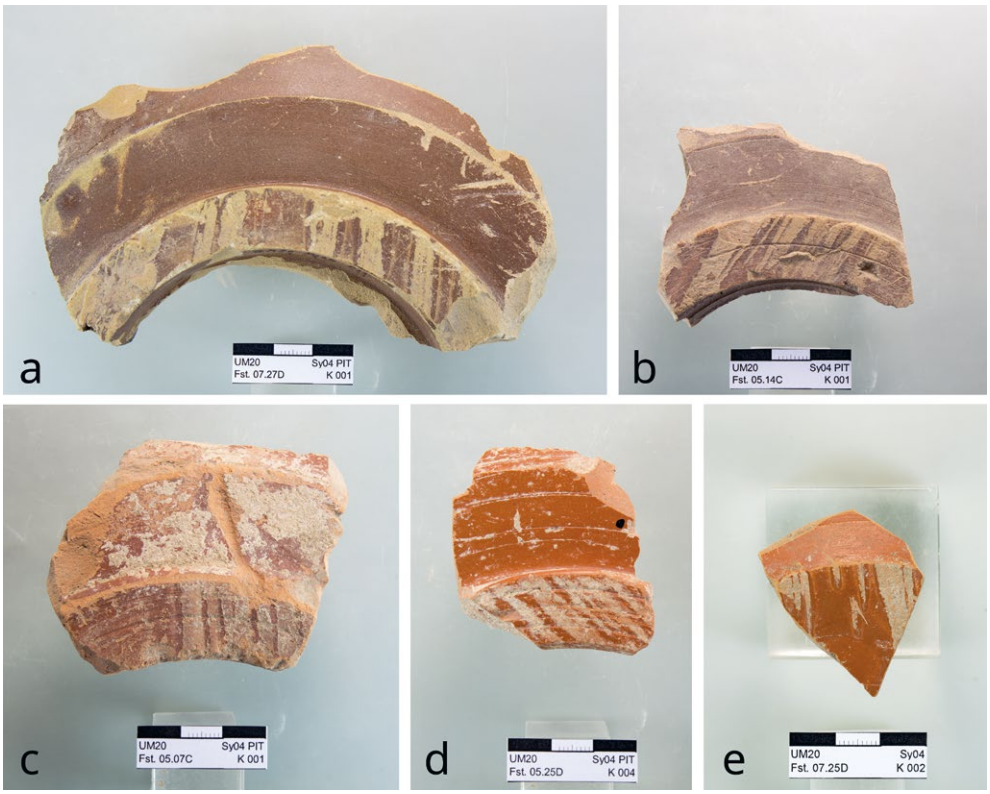
Manufacturing Defects and Repairs

56 An intriguing feature was observed on the resting surface of several (mostly ring) bases, namely, parallel, linear ›scratches‹ where the slip is not preserved (Fig. 13). These bases are primarily attributable to Loeschcke Type 26 or Hayes Form 1. These ›scratches‹ show no or hardly any curvature which rules out that these vessels were

145 Murphy – Poblome 2012, 201. 203. 205–207 tab. 1, 7 figs. 2 c. d.; 3. 4. It is thought that the »ceramic varieties« of such ribs »were formed before firing and occasionally display post-firing edge finishing«.

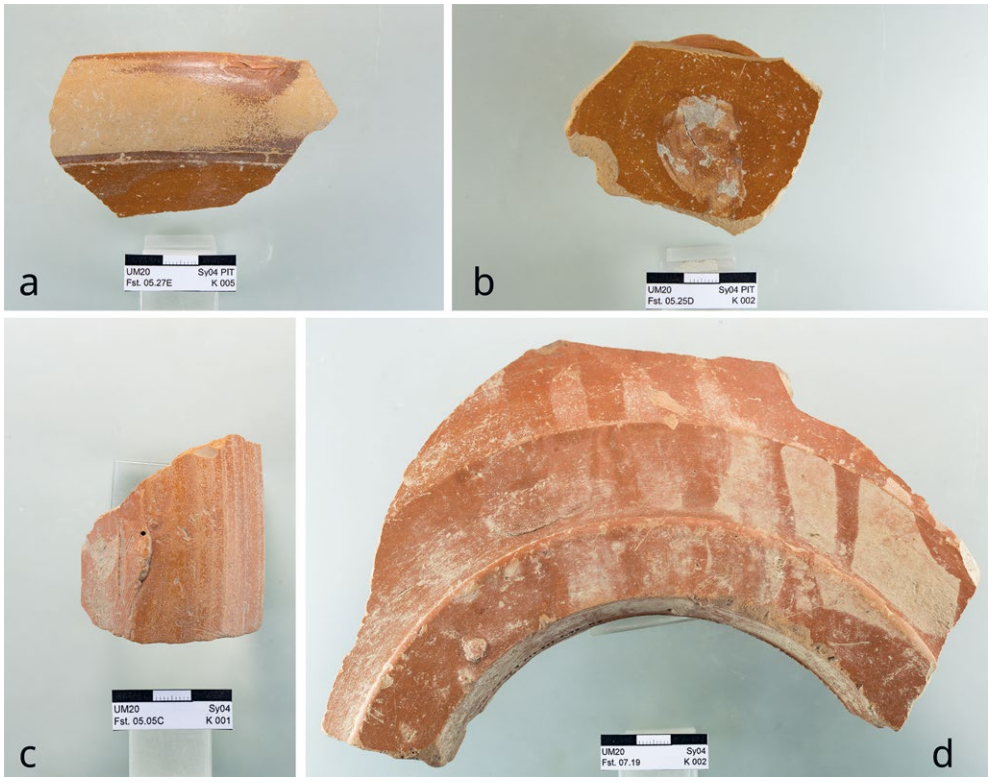
146 Loeschcke 1912, 353 fig. 4, 3. 9.

147 E.g. Matera 2015, 425 f. fig. 6.



13

Fig. 13: Possible damage marks from drying. (a) Inv. UM20 Fst. 07.27D K 1; (b) Inv. UM20 Fst. 05.14C K 1; (c) Inv. UM20 Fst. 05.07C K 1; (d) Inv. UM20 Fst. 05.25D K 4; (e) Inv. UM20 Fst. 07.25D K 2



14

Fig. 14: Small manufacturing errors, which were sometimes ›repaired‹. (a) Inv. UM20 Fst. 05.27E K 5; (b) Inv. UM20 Fst. 05.25D K 2; (c) Inv. UM20 Fst. 05.05C K 1; (d) Inv. UM20 Fst. 07.19 K 2

removed by string-cutting. Rather, after the slip was applied, the vessel was put to dry, plausibly on a surface with a linear texture (e.g. a wicker mat) yet when the slip was still (too) wet, which consequently adhered with the surface on which it was placed. Eventually, someone lifted the vessel, causing the slipped surface to scar in this particular way. A further, heterogeneous range of mistakes, repairs and failures was observed, and

15

Fig. 15: A selection of spacer discs illustrating their range in size, shape, and condition. (a) Inv. UM19 Fst. 01.10B KF 756; (b) Inv. UM19 Fst. 01.09A KF 746; (c) Inv. UM19 Fst. 01.01 KF 773; (d) Inv. UM19 Fst. 01.17A KF 1013; (e) Inv. UM19 Fst. 01.19E KF 1014; (f) Inv. UM19 Fst. 01.34A KF 1119; (g) Inv. UM19 Fst. 01.19C KF 1019; (h) Inv. UM19 Fst. 01.27A KF 1077 (partly overfired); (i) Inv. UM19 Fst. 02.08E KF 1370 (overfired); (j) Inv. UM20 Fst. 07.27D K 2

paying attention to these is of some relevance. For instance, there are traces indicating that, prior to firing, potters attempted to patch up or repair small indents or cracks, though not always (Fig. 14)[148]. Such ›repairs‹ are not only visual clues indicating that potters deemed it worthwhile to ›fix‹ such vessels. More importantly, they offer insights into manufacturing and firing techniques as well as into behaviour and thinking of the people involved in the workshops and the unloading of the kiln, regarding selection and aesthetic criteria as to which vessels were deemed suitable to be sold/used[149], and which were not (cf. infra).

Vessel Stacking and Firing Stages

57 Various artefact categories can be associated with vessel stacking inside the kiln and the actual firing. Whereas some categories need not stricto sensu pertain to pottery kilns, the site or find context proper as well as the near-absence of evidence for other artisanal activities (a few tiny bits of possible iron slag were found) which required kilns, make it plausible that all categories discussed here can be associated with the manufacture and firing of ESC and LRC.

Spacer Discs

58 Considerable quantities of small, circular or sometimes ovoid or lenticular artefacts were found across much of the survey zone (Fig. 15); some are overfired or show signs of vitrification and shrinkage (Fig. 15 h. i). These are spacer discs (»Zwischenlegplätzchen«[150] or »pad-like kiln supports«[151]) which were used to separate certain types of vessels (cf. infra) in the kiln to allow heat and gases to circulate as much as possible during the firing process[152], and possibly also to provide stability to stacks of vessels.

148 See e.g. Sultov 1985 pl. XXV, 1.

149 Sultov 1985, 54 f.

150 Loeschcke 1912, 353 fig. 4, 4. 5. 8, also 355 (»knopfartige Thonscheibchen«).

151 Hayes 1972, 317.

152 Loeschcke 1912, 353 fig. 4, 2. 6; vessel fragments with fused discs were also collected at nearby Elaia: Ateş 2017, 513 fig. 5.

16

Fig. 16: Spacer discs fused with a vessel; impressions of (incomplete) spacer discs. (a) Inv. UM19 Fst. 02.15D KF 1511; (b) Inv. UM20 Fst. 07.27C K 4; (c) Inv. UM20 Fst. 05.13E K 1; (d) and (e) Inv. UM19 Fst. 01.02 KF 1087; (f) Inv. UM20 Fst. 07.28D K 4

Larger vessels in ESA were also separated using such discs[153], which may have provided inspiration for the potters in Pitane. It is not uncommon for a spacer disc to have some small cracks around the edge (Fig. 15 d). On occasion, a spacer disc had fused with a vessel during firing (Fig. 16 a–c, cf. infra), and fairly often can one observe the imprint of such discs on the underside of ring bases and/or on the interior floor of vessels (Fig. 16 d–f), a feature which has also been observed at consumption sites[154]. Imprints of incomplete spacer discs (Fig. 16 f) also suggest they were reused. A number of these discs have an uneven thickness (i.e. they taper) which ranges from 2 to 10 mm. Also, calculating an average diameter can neither be precise nor reliable since many spacer discs are not circular or are incomplete; of the 221 specimens of which the width(s) could be measured, the average is 19.2 mm[155]. Their width ranges between 15 and 37.3 mm, although values above 25 mm are rare. The observed range in widths and thicknesses can be (partly) explained by vessel stacking: the lower down in a stack of vessels, the more weight rested upon the spacer discs, causing these to increasingly flatten and/or deform.

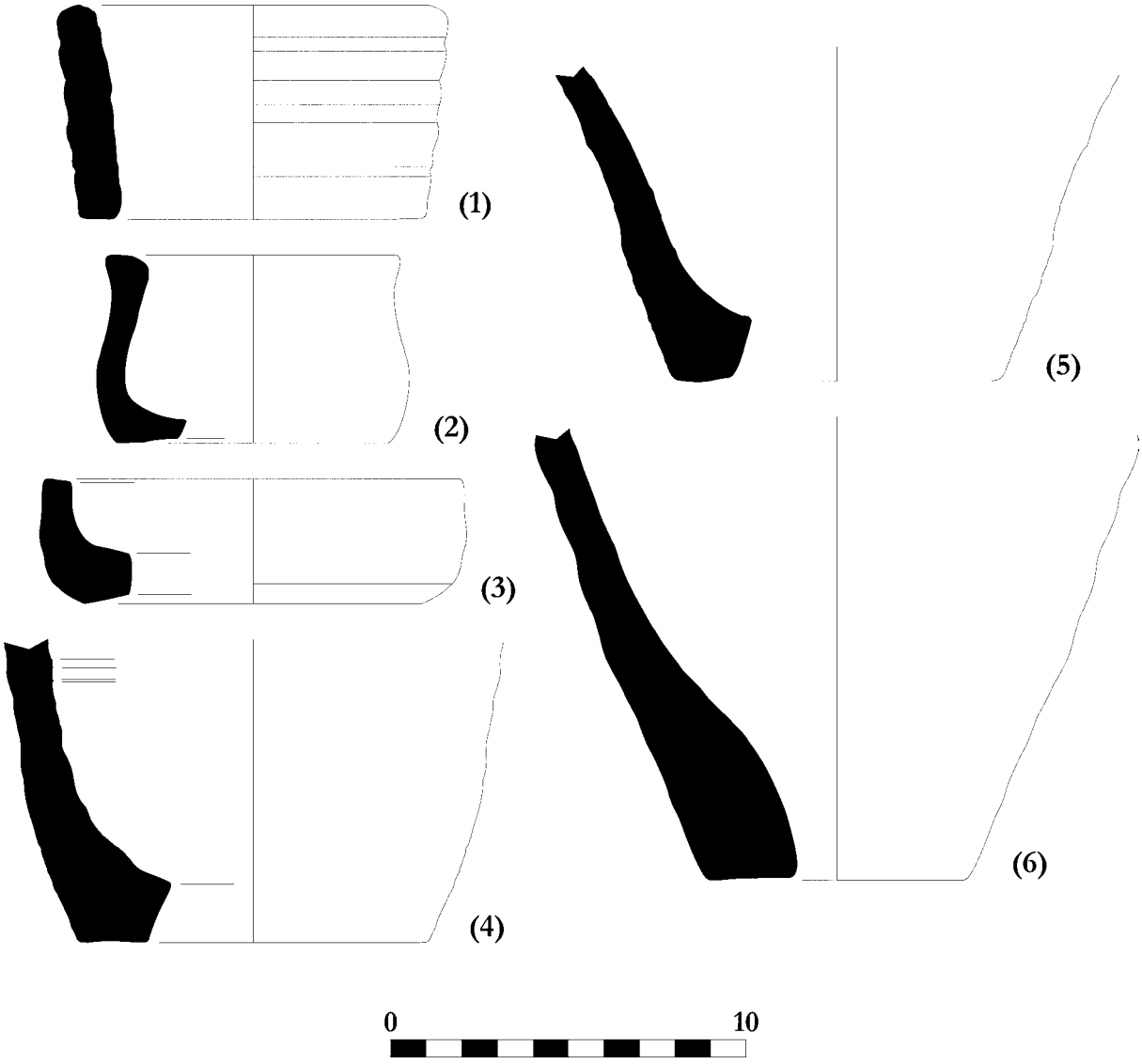
59 Taking the size of ring bases and the distance between disc impressions into consideration, the stacking of two specimens of Hayes Form 1 required three spacer discs, as Loeschcke and Hayes already observed[156]. Four discs were possibly used for the largest vessels, but in the absence of complete ring bases of such vessels this remains conjectural. Thus, stacking 100 specimens of Hayes Form 1 required 99 × 3 = 297 discs. Spacer discs were presumably prefabricated en masse but not fired prior to use. This is based on parallel, linear impressions (Fig. 15 j), and above all the occurrence of wedge-shaped spacer discs, plausibly the result of the weight of multiple vessels; the lower a vessel was placed in a stack, the more weight. Moreover, the use of fired spacer discs could make a stack of vessels less stable: being inert, they would not adapt to the growing weight of the stack. While one may imagine that the task of making these discs

153 Hayes 1985, 9.

154 E.g. Hayes 1983, 118 f. fig. 2, 3.

155 Loeschcke 1912, 355 (»etwa 2 cm Durchmesser und etwa ½ cm Dicke«).

156 Loeschcke 1912, 353 fig. 4, 6; Hayes 1972, 317.



17

Fig. 17: Profile drawings of various kinds of stacking devices.
(1) Inv. UM19 Fst. 01.55 K 1;
(2) Inv. UM20 Fst. 07.18A K 1;
(3) Inv. UM20 Fst. 07.25C K 2;
(4) Inv. UM20 Fst. 07.05E K 3;
(5) Inv. UM20 Fst. 07.27A K 2;
(6) Inv. UM20 Fst. 07.23D K 1

was tedious, it did require precision. Namely, in the process of stacking vessels inside the kiln it was necessary to maintain a vertical axis, so each disc had to be of (more or less) the same thickness. This vertical axis also pertained to the actual placing of the discs: these had to be vertically aligned to prevent deformation resulting from an unequal distribution of weight. However, a few clues indicate that such precision was sometimes neglected (cf. infra, Fig. 25 e).

60 Interestingly, the use of spacer discs was restricted to larger, commonly occurring vessel types, such as ESC Hayes Forms 1 and 2. Other vessel types were fired without the aid of spacers: such ›simple‹ vessel stacking for example pertained to flanged bowls of Loeschcke Type 19 and Hayes Form 3, but certainly not only such smaller vessels; plates of ESC Hayes Form 4 were also stacked one on top/inside the other. Whether spacer discs were also used in the stacking of large platters such as Loeschcke Types 4 and 7[157] is unclear: whilst no such traces were observed, fragments of these types were scarce. Spacer discs were not used for the firing of LRC vessels, pointing to a change in the chaîne opératoire sometime in the 4th century.

157 Loeschcke 1912, pl. 28.

18

Fig. 18: Selection of fragments of various kinds of stacking devices

Stacking Devices

61 Fragments of thick-walled and often very hard-fired objects were found across much of the survey zone. Three basic types can be distinguished: ring-shaped, tronco-conical, and cup-shaped, all three displaying a considerable range in thickness, height, diameter and/or overall size (Fig. 17). They never carried any slip, and some were relatively carelessly finished. It is worth observing that the tronco-conical and cup-shaped types had a circular hole cut out at one end prior to firing, and thus are ›open‹ at both ends. Some show signs of shrinkage and vitrification (note the light green colour of several examples in Fig. 18), though none are actually warped or show traces of bloating. Particularly noteworthy is that some fragments bear the imprint of a spacer disc, and in a few instances a spacer disc had actually fused to one of the object's surfaces. Although their exact purpose(s) elude(s) us[158], these objects were used in the kiln during firing and have been classified as stacking devices – an interpretation which is based on similar devices found for example in Athens, in pre-Roman Imperial Falerii (Italy) and Metapontum, there named »sostegni« (›supports‹) or »distanziatori« (›separators‹)[159], and were (still?) in use during the very late Byzantine period[160]. A significant difference are small circular ›vent‹ holes which appear to be a common feature of the »sostegni« from Falerii, which were not observed on any of the specimens from Çandarlı. Also, no graffiti, whether pre- or post-cocturam, of any kind were observed.

158 The description of certain artefacts by Loeschcke 1912, 356 f. matches the tronco-conical variant, though he (also) remained uncertain how exactly these had been used: »fast cylindrischen *niedrigen Thonrohre* mit axial stark verengtem Abschluss an einer Seite, gehe ich hier nicht weiter ein, da noch nicht feststeht, ob sie als Untersätze beim Brand dienten, ob sie von der Ofenconstruction oder wovon sonst herrühren. Die Höhe der bisher gefundenen Exemplare schwankt zwischen 5–15 cm« and »[d]ass sie bei der Fabrication der Töpfe verwendet wurden, scheint mir aber ausser Zweifel zu stehen« (›I will not go into further detail here about the almost cylindrical low clay tubes with an axially strongly tapering end on one side, as it is not yet clear whether they were used as bases during firing, whether they originate from the kiln construction or from what else. The height of the specimens found so far varies between 5–15 cm‹ and ›[t]hat they were used in the manufacture of the pots seems to me beyond doubt, however‹).

159 Rotroff 1982, 93 pl. 72 nos. 414. 415 (classified as »stacking rings«); Falerii: Biella – Michetti 2017, 163–167 tab. 1 figs. 1. 2 (specimens from Çandarlı bear resemblance to types II.b–d, III.b, d and V.a; a few resemble type V.i–j); Metapontum: Cracolici 2003, including reconstructions (51–56) which tentatively illustrate the function/use of the different morphological groups of »sostegni«. Also see Chenet – Gaudron 1955, figs. 42–45.

160 Conical objects labelled »kiln furniture« or »conic setters« appear to have been used as supports during the firing of glazed tableware vessels; see Daskalov – Todorova 2018, 219. 221 pl. 3, 1–11.

Fig. 19: Reconstruction illustrating the use of spacer discs – the overall setup is tentative

19

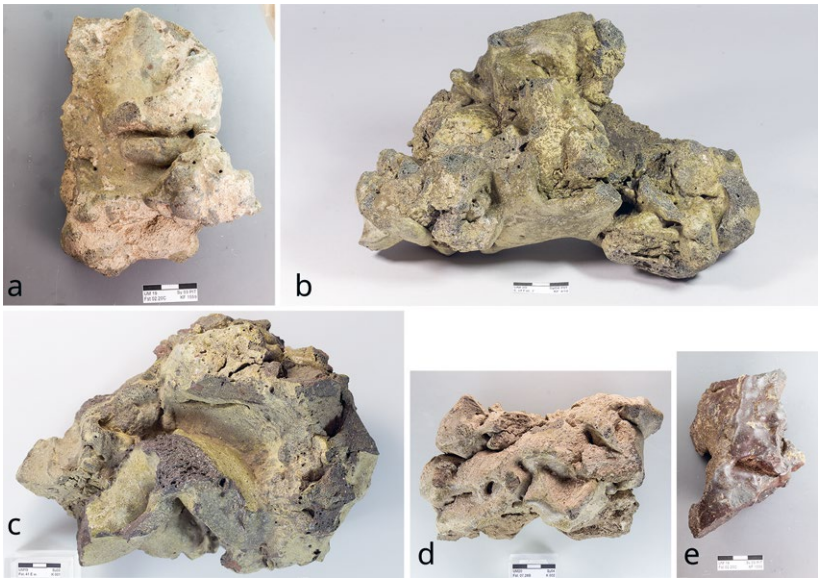


Fig. 20: Fragments of kiln slag. (a) Inv. UM19 Fst. 02.20C KF 1559; (b) found east of UM20 Fst. 07 KF 410; (c) Inv. UM20 Fst. 04.01 K 1; (d) Inv. UM20 Fst. 07.28D K 2; (e) Inv. UM20 Fst. 02.20C KF 1556

20

62 The thickness and sturdy character of most of these devices suggests they could withstand heat and carry a considerable weight. Since spacer discs were apparently only used for larger vessels such as Loeschcke Type 26 and Hayes Form 1, and impressions of as well as fused discs were found on some stacking devices, this allows to consider the attractive hypothesis that these devices were used at the bottom of a stack of such vessels (Fig. 19). A stack of vessels formed a considerable weight and required stability along its vertical axis. This was achieved through the placement of spacer discs (cf. supra), but the stack as a whole also required stability. In this scenario, a (tronco-conical?) stacking device was placed at the very bottom of a stack and thus rested on the perforated kiln floor, absorbing the greatest blast of heat and energy coming from the firing chamber below, thus protecting the lower segment of vessels from overexposure. This hypothesis also implies that vessels were placed upside-down. The observed variety in size etc. can be explained by the different forms that were manufactured, which would match with a certain size of stacking device. Stacking devices at the smaller end of the

21

Fig. 21: Fragments of kiln lining.
(a) Inv. UM20 Fst. 05.19B KF 414;
(b) Inv. UM19 Fst. 01.01 KF 1007;
(c) Inv. UM19 Fst. 02.12C KF 1427;
(d) Inv. UM20 Fst. 06.05A K 1;
(e) Inv. UM19 Fst. 01.30 K 2

size spectrum could also have been used to separate individual vessels. Another possibility is that an unfired vessel was placed on such a device, allowing the potter to finish the exterior and/or underside/ring base of a vessel[161]. In particular the tronco-conical devices are not thought to have been vaulting tubes used in the construction of a kiln's dome, or vaults more generally[162], because of their weight, plus, morphologically they do not seem suitable for interlocking.

Kiln Slag

63 Equally common across much of the survey area are smaller and larger greyish-green amorphous chunks, often with smooth, multi-lobed surfaces, and with a seemingly fine consistency (Fig. 20). Some of these have dark purplish surfaces which potentially represent a somewhat different aspect of kiln firing (Fig. 20 e). These are kiln slags: excessive temperatures in (parts of) the kiln eventually caused the kiln lining (cf. infra) to melt and accumulate at the bottom of the firing chamber. None of the fragments of kiln slag that were collected contained anything that resembled (parts of) vessels.

Kiln Lining

64 A last category representing the firing stage was not immediately distinguished during the survey, and fragments were therefore initially classified under kiln slag. However, it was quickly realised that their composition is distinctly coarser, they are rougher to the touch, their colour more commonly darker grey to blackish, and have one flat or concave surface that bears distinct parallel ridging which is either straight or somewhat curved (Fig. 21)[163]. These fragments belonged to the original kiln lining:

161 Sultov 1985, pl. XV, 5. 7 showing a modern potter at work. Pl. XV, 7, however, shows the use how to finish the underside of a small jug; there is no evidence that closed vessels were manufactured at Çandarlı during the Roman Imperial to Late Antique period, though see Loeschcke 1912, 381 Type 36.

162 For vaulting tubes, see e.g. Lancaster 2012. For similarly shaped vessels albeit with different functions, see Bernal Casasola – Sáez Romero 2006.

163 Similar fragments have been found at Cuma (Italy) and are also interpreted as lining, while simultaneously

(part of) the kiln's interior was coated with a clay/adobe mixture, conceivably for two reasons: (1) to protect the actual kiln structure, in particular the walls of the firing chamber as these were directly exposed to the burning fuel and resulting high temperatures; (2) as an insulation to help retain more of the heat and energy within the entire kiln. Though firing a kiln and reaching the subsequent temperature stages required care[164], the lining plausibly permitted to reach higher temperatures within shorter periods of time and/or to achieve a more efficient firing regime in terms of duration and necessary fuel. It is not entirely implausible that the vessel chamber (i.e. where the pots were stacked) was also lined[165].

Post-Firing Stages: Defects and Discard

65 As mentioned, the arguments to attribute artefacts to this or the previous group are not poured in concrete. This third and last group is regarded to represent the stage after a kiln load was fired, had been left to cool down, and the kiln emptied and cleaned.

Vessel Wasters

66 A significant number of fragments were classified as vessel wasters, a selection of which is illustrated in Figs. 22. 23. Vessel wasters are here regarded as vessels that the ancient potters saw as failed, inevitably bringing up the question what the people back then understood as ›failed‹? Simply because Pitane was a production centre does not automatically mean that every TS/RSW fragment that is found represents waste. Quite the contrary: there are many ›good‹ fragments, and the identification of many (imported) Roman-period amphorae, cooking as well as tablewares[166] also point to a settlement whose residents surely also used tablewares. Evidence from consumption sites, the function of a vessel, and an aesthetic appreciation are factors to assist the differentiation process, yet, since we are by definition dealing with fragmentary pottery, these criteria can only be approximated. Here, criteria to determine whether a fragment is a waster are signs of warping and/or bloating, a heterogeneous range of manufacturing and firing defects (cf. infra) and, perhaps most obviously, the fusing of two or more vessels. More ›subtle‹ signs are arguably more arbitrary. For instance, reduced/overfired exterior rims (cf. infra) are a characteristic above all of LRC as a result of vessel stacking, and are often observed at consumption sites. Such rims were classified as wasters, however, when for example they display shrinkage or vitrification. Another aspect that points to vessel stacking, and possibly was a criterion for discard, are small, thin, irregular and often partial ridges of clay found upon the lip of some ESC Loeschcke Type 26A, Hayes Form 2 as well as ESC/LRC Hayes Form 4/1 rim fragments. This represents the thin contact zone of two stacked vessels and where they had fused during firing. During the unloading of the kiln these had to be detached from one another, which left such traces. Which selection criteria existed in Antiquity is not known, the above is an attempt. While there obviously were successfully-fired vessels and wasters, a degree of ›fuzziness‹ – a to us less or non recognisable group – could have existed. For example, vessels with minor surface repairs (cf. infra) could nonetheless have been deemed suitable for sale and/or use, perhaps in the spirit of ›three for the price of two!‹. Fig. 24 lists of which ESC,

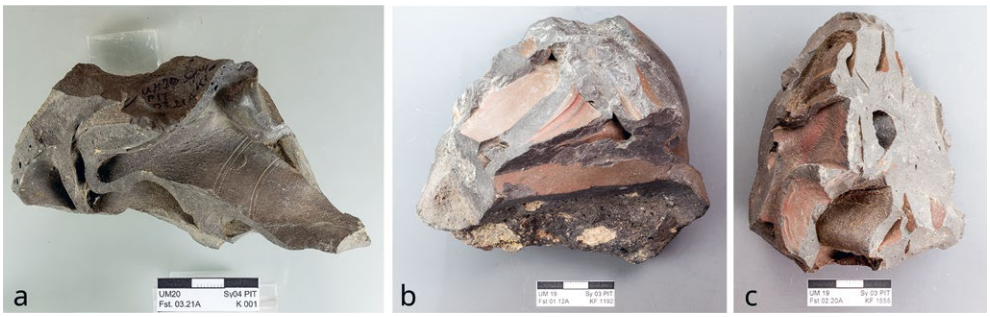
being used to fix vessels within the kiln, which explains the imprints of rims and bases (Borriello et al. 2016, 12 figs. 3, 1–3, 3).

164 Rice 2015, 99–116.

165 Giannopoulou 2020, 229. 235 fig. 37, showing a potter on Crete coating the interior wall of a pottery kiln with »thick layers of clay mixed with straw«.

166 The imported pottery encompasses a broad range in particular of amphorae (Campanian, Sinopean, Levantine, amongst others). A significant share of the cooking and tablewares were imported from Phokaia, and a small quantity of mostly Late Roman African Red Slip Ware was also identified.

22



23

Fig. 22: Selection of vessel waster fragments. (a) Inv. UM19 Fst. 01.03 KF 1121 (note the stamp); (b) Inv. UM19 Fst. 01.02 KF 1093; (c) Inv. UM19 Fst. 01.02 KF 1092 (possibly Hayes Form 2 or related; (d) Inv. UM19 Fst. 01.02 KF 1071 (presumably ESC Hayes Form 4 or LRC Hayes Form 1); (e) Inv. UM20 Fst. 05.26 K 1 (part of the ring base of a vessel fused to the interior of a second vessel, possibly Loeschcke Type 2 or Hayes Form 1/2); (f) Inv. UM19 Fst. 01.11D KF 1191; (g) Inv. UM20 Fst. 03.12E K 3 (Loeschcke Type 26A, early variant); (h) Inv. UM20 Fst. 05.19B K 7; (i) Inv. UM19 Fst. 02.19D KF 1489 (presumably ESC Hayes Form 4 or LRC Hayes Form 1 or 3); (j) Inv. UM19 Fst. 02.07E KF 1345 (LRC Hayes Form 3 (note the rouletting))

Fig. 23: Parts of fused vessel wasters. (a) Inv. UM20 Fst. 03.21A K 1 (presumably ESC Hayes Form 4 or LRC Hayes Form 1); (b) Inv. UM19 Fst. 01.12A KF 1192; (c) Inv. UM19 Fst. 02.20A KF 1555 (possibly Hayes Form 3 or a related shape)

Category	Type	Quantity
ESC	A3	8
	A6-7	1
	A7	1
	H1	36
	H1/H2	3
	H2	25
	H3	16
	H4	37
	L1	1
	L6	2
	L9	2
	L15/L19	9
	L19	36
	L19/H3	8
	L19/L20	1
	L20	1
	L21	1
	L26	62
	L26/H1/H2	11
	L27	1
	L29	1
	Early	2
	Unidentified	104
ESC/LRC	H4/H1	256
	Unidentified	466
LRC	H1	14
	H1/H3	1
	H2	4
	H3	45
	H3	1
	Unidentified	21
	TOTAL	*1177*

Fig. 24: Quantitative overview of fragments regarded as vessel wasters, sorted by type

LRC and ESC/LRC types vessel wasters have been identified. While the ›wasterness‹ of some of these can be disputed, most show clear signs of warping, bloating, or are segments of fused stacks of vessels, thorough proof which types were manufactured locally. Interestingly, vessel wasters resembling LRC Hayes Form 10 were not identified.

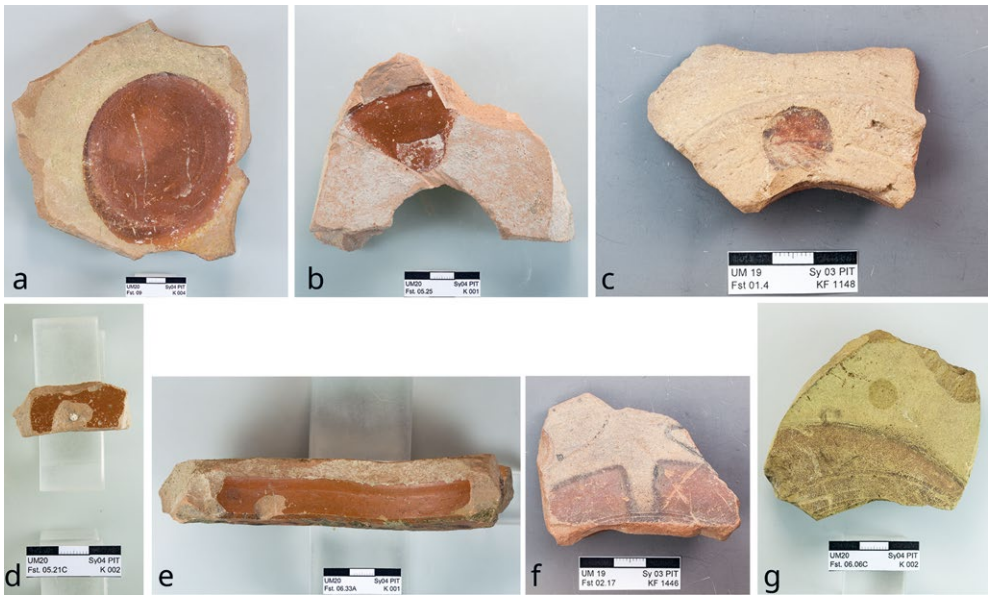
Other Firing Defects

67 During the firing process, vessels ›suffered‹ from variable conditions. Slip burning is observed fairly often, presumably caused by excessive temperatures and/or localised kiln conditions, which resulted in various patterns: some fragments preserve (part of) a circular or ovoid area where the slip is preserved, presumably an area protected by other vessels or objects (Fig. 25 a). A few fragments show slip preserved in a fan-like pattern around the impression of a spacer disc, possibly indicating the preferential direction from where (most of) the heat was coming (Fig. 25 b). On other fragments the slip is only preserved where a spacer disc had been placed (Fig. 25 c). Some errors or mistakes are rarer, such as lime spalling (Fig. 25 d) or ring bases that were deformed because of unevenly placed spacer discs (cf. supra) (Fig. 25 e). Furthermore, the discolouration of exterior rim surfaces into a lighter or darker hue as a result of vessel stacking is a well-known aspect, in particular of LRC, as already mentioned. Such rims were encountered albeit not in great numbers – discoloured rims seem to be more common on LRC that was (presumably) manufactured at Phokaia. In fact, specimens published from consumption sites[167] make clear that discoloured rims were not in the least an obstacle for their distribution far and wide. This also indicates that vessel stacking – and the resulting discoloured rims – was a technological feature which the LRC workshops in Phokaia and Pitane shared. Perhaps such discoloured rims even were part of an aesthetic appreciation for LRC, similar to what has been argued for Pergamene slipped tablewares of Middle Hellenistic to Early Roman Imperial date[168].

68 Last, three items of unclear purpose or function are nonetheless worth illustrating. First, an incomplete, enigmatic object – hard-fired, similar to stacking devices – with an irregular row of pierced holes on one side (Fig. 26 a), and at the other end a small accumulation of what appear to be small, fired clay flakes (Fig. 26 b). Second, part of an overfired and heavy, possibly tubular object or vessel which is adorned with triple-outlined tear- or drop-shaped appliqués and impressed, presumably eight-petalled rosette or flower motifs (Fig. 26 c). Third, a chunk of probable kiln slag or lining. Noteworthy about this artefact are parts of what may have been three rounded openings (indicated with partial circles in Fig. 26 d), which lead to the tentative idea that this was part of a perforated kiln floor which separated the firing chamber from the vessel chamber.

167 Hayes 1972, 324. A number of LRC rims found at Tanagra in Boeotia (pers. obs.; courtesy of the Ancient Cities of Boeotia Project) are also discoloured.

168 Japp et al. 2016.



25

Fig. 25: Various firing defects. (a) Inv. UM20 Fst. 09 K 4; (b) Inv. UM20 Fst. 05.25 K 1 (note the impression of an incomplete spacer disc); (c) Inv. UM19 Fst. 01.04 KF 1148; (d) Inv. UM19 Fst. 05.21C K 2; (e) Inv. UM20 Fst. 06.33A K 1; (f) Inv. UM19 Fst. 02.17 KF 1446; (g) Inv. UM20 Fst. 06.06C K 2

26

Fig. 26: Artefacts of uncertain or unidentified function or purpose. (a) and (b) Inv. UM20 Fst. 09 K 6; (c) Inv. UM20 Fst. 07.20A K2; (d) Inv. UM20 Fst. 06 KF 445

Locally Manufactured ESC and LRC: Fabrics, Surface Treatments and Repertoires

69 The identification and classification of Çandarlı Ware (= ESC produced in Pitane) mainly rest on Loeschcke's original research and Hayes' later studies (cf. supra)[169]. Already in 1962, however, Jörg Schäfer expanded the repertoire of TS from the Pergamon micro-region by the publication of ESC from Pergamene contexts (including the Asklepieion), thereby integrating Late Hellenistic and Augustan red slipped pottery. Schäfer's definition of »lokalpergamenische Sigillata« parallels the ESC found in Pergamon with TS produced in Çandarlı, though he did not rule out Pergamene production[170]. Extensive pottery workshops were uncovered by Turkish rescue excavations under the direction of Selahattin Erdemgil and Ömer Özyiğit in the Kestel Çayı (ancient Ketios Valley) – northeast of Pergamon's City Hill – between 1978 and 1980 and 1985 and 1988. This discovery provided crucial evidence concerning the production of ESC, and possibly also LRC, in Pergamon's suburbium[171]. Hence Carsten Meyer-Schlichtmann, in his presentation of ESC from cistern contexts from Pergamon's City Hill, preferred the term »pergamenische Sigillata«. He considered that the ESC from these contexts was manufactured in the Ketios Valley workshops, meaning that an ›auxiliary term‹ such as ESC was not necessary[172]. Furthermore, this »pergamenische Sigillata« needs to be differentiated from Çandarlı Ware since this was produced in Pitane – Meyer-Schlichtmann did not, however, clarify how this differentiation would work for a regional ware with (partly) shared repertoires and macroscopically indistinguishable fabrics[173].

70 The study of ESC within the Pergamon region still largely relies on Schäfer's and Meyer-Schlichtmann's typologies, where Loeschcke's and in particular Hayes' (for Çandarlı Ware[174]) are used elsewhere. This possibly implies that Pitane rather than Pergamon was regarded as the origin of ESC found further afield, or perhaps Hayes' typology was more widely recognised[175]. In some publications, a distinction was made between ESC from Pergamon and from Pitane based on fabrics, slips[176] and typological repertoires[177]. Recent analyses have shown, however, that ESC produced in Pitane cannot be distinguished macroscopically from ESC produced elsewhere in the Pergamon micro-region, for example in the Ketios Valley[178]. The Pergamon excavation therefore recommends to use ESC

169 Loeschcke 1912; Hayes 1972; Hayes 1985.

170 Schäfer 1962, 779: »[d]iese Keramik ist mit der von Loeschcke in Çandarlı ausgegrabenen und als lokal erkannten identisch« (›[t]his pottery is identical to the one Loeschcke excavated in Çandarlı and recognised as local‹).

171 For a summary, plan and the typological output of the workshops, see Bounegru – Erdemgil 1998; Bounegru et al. 2001. For a summary and comprehensive bibliography on these workshops: Bes – Keweloh-Kaletta 2024, 230 fig. 15.

172 Meyer-Schlichtmann 1988, 11.

173 Meyer-Schlichtmann 1988, especially 11. 14.

174 Meyer-Schlichtmann's typology is nevertheless quite regularly used for the classification of Late Hellenistic TS (fully red as well as bicoloured). See e.g. Rotroff – Oliver 2003, 84–88.

175 However, it is often overlooked that Hayes' extension (Hayes 1972) of Loeschcke's typology was based on material from sites across the Mediterranean, for which a provenance in Pitane/Çandarlı is uncertain. Furthermore, in 1985 he published pottery from Pergamene contexts – for example from the Asklepieion – as »Çandarlı Ware«, even if a provenance from the Ketios Valley workshops is as, or even more, plausible.

176 Zelle 1997, 20–27, classified ESC from Pergamon as ESC Group 1, and ESC from Pitane/Çandarlı as ESC Group 2. He further distinguished, based on slip and fabric colour, an ESC Group 3 having a »hellgelben, häufig leicht gekörnten, doch stets feinen Ton« (›light yellow, often slightly grainy, but always fine clay‹). Kögler 2010, 379–384, summarises the Pitane ESC and Zelle ESC Group 3 using Hayes' 1985 typology and separates these from the »pergamenischen Sigillata« using Meyer-Schlichtmann's (Meyer-Schlichtmann 1988) typology.

177 Based on the outdated assumption that only the Pitane workshops continued production into the 2nd–3rd centuries. See e.g. Hayes 1985, 71–78; Hayes 2008, 49–52; Lätzer-Lasar 2020, 100 f. Archaeometric analyses allowed to assign fragments of 1st- to 3rd-century forms such as flanged and carinated bowls to the chemical group associated with the Ketios Valley; see Japp 2009, 214 (samples Perga 15. 28. 30. 34. 40. 43. 53. 62. 68. 69. 73. 83. 95. 101).

178 Schneider – Japp 2009, 294–296; Schneider – Mommsen 2009, 223–225; Japp 2014, 19.

as an umbrella term for Hellenistic and Roman Imperial red slip tableware as well as the bicoloured, black-and-red tableware[179] from the Pergamon micro-region, unless analyses unequivocally allow to assign fragments to the Ketios Valley, Pitane or Elaia[180] workshops, which would in turn allow to classify fragments as ESC from Pergamon, Pitane or Elaia[181].

Methodological Approach of Fabric Study and Classification of ESC and LRC Produced in Pitane

71 To gain insights in the (macroscopic) variability of clay and clay recipes used in the Pitane workshops, each and every sherd of red slip tableware that was collected and brought back to the excavation house for study was matched with a macroscopic fabric reference collection (cf. supra) and classified accordingly[182]. Ultimately, of course, the validation of the macroscopic fabric groups rests on archaeometric analyses (cf. infra). One of the main aims of the fabric reference collection and subsequent sample selection was to define and document the spectrum of locally produced pottery – i.e. ESC and LRC – and how this differs from imported groups. Deciding factors in considering a macroscopic fabric as local are (1) fragments displaying a range of firing defects (cf. supra), (2) quantity in the overall survey collection, (3) typology, and (4) existing knowledge concerning clay variability within the regional context of pottery production[183].

72 Coherent fabric groups were defined for the Pitane material[184], which only later were matched with existing knowledge based on archaeometric analyses and previously established fabric groups of ESC and LRC produced in Pitane. Fabric groups are distinguished based on macroscopic examination of a fresh break – with or without a magnifying lens (with 10×/12×/15× magnification) – focusing on colour, granulation, and porosity, as well as the kind, size, sorting and quantity of inclusions. In other words, defining criteria are characteristics of the clay matrix, inclusions (and temper?[185]) and attributes resulting from firing temperature and conditions[186].

73 Not each fabric group thus defined needs to represent a different clay source or a unique archaeometric reference group[187]. Macroscopic differences could pertain to layers with different composition within the same clay deposit, temper, clay preparation, and firing conditions; also, post-depositional processes can alter the appearance of a sherd. In the case of Pitane, differences in slip quality (dull or shiny; thick or thin) were also taken into account regarding the macroscopic definition of fabrics, in order to investigate whether vessel groups exhibiting the same/a similar macroscopic fabric yet having a different slip or surface treatment more generally[188], could be differentiated. Fragments attributed to a single macroscopic fabric group can nevertheless display variations in colour, the number of inclusions, porosity as well as slip colour and quality; as often in

179 For Late Hellenistic bicoloured tableware in Pergamon, see Engels et al. 2013; Japp et al. 2016. For a definition of ESC that also encompasses Late Hellenistic bicoloured tableware, see Rotroff – Oliver 2003, 84 (»Pergamene sigillata […] covered with an excellent, satiny glaze, often contrasting black and red«); Kögler 2010, 381.

180 For archaeological and archaeometric evidence of ESC production in Elaia, see Japp 2009, 251–256 (samples Ela 4. 7. 17. 19; Ateş 2018, 124 fig. 4.

181 For a definition of ESC based on technological (fully red slipped; bicoloured with sharp stacking lines) rather than typological criteria, and its difficulties from the Pergamene perspective, see Engels et al. 2012; Japp 2014.

182 Bes – Keweloh-Kaletta 2020, 80 f. fig. 85; Bes – Keweloh-Kaletta 2021, 64–67 fig. 70.

183 For previous archaeometric analyses on pottery from Pitane, see Mayet – Picon 1986, especially 135 tab. 1; Japp 2009, especially 200. 202 f. 206 f. 248–250. figs. 24. 26.

184 As recommended for example by Orton et al. 1993, 132–140.

185 Rice 2015, 79–88.

186 A definition of fabrics primarily based on the fired clay matrix and not on surface treatment is proposed by Orton et al. 1993, 67 and was applied, for example, to TS found in Magdalensberg (Radbauer 2003, 44) and in Sagalassos (Poblome 1999, 27; Degeest 2000, 72).

187 Daszkiewicz 2014, especially 184 f.

188 For a definition of fabrics comprising slip characteristics, see Lätzer-Lasar 2012, especially 224; Kögler 2010, 24–26. According to Orton et al. 1993, 239 »[t]he convention is used that large zones of slip are a fabric characteristic, but details are dealt with as decoration«.

classification systems, distinctions between different groups are not always necessarily sharp and unambiguous, and hence can display some variability. For each fabric group, several reference pieces were selected which mirror a fabric's range in characteristics.

74 Descriptions of fabric groups are based primarily on such reference pieces, in particular fragments from each group selected for archaeometric analyses. Descriptions include a short verbal characterisation combined with a set of parameters describing the matrix[189] and inclusions/temper as visible on a fresh break with the naked eye, a hand lens or using a digital microscope[190]. Descriptions are supplemented with information on each group's typological repertoire and references to selected samples:

- **Colour**: given for fabric and slip, determined using the Munsell Soil Color Chart[191];
- **Hardness**: recorded using the system described by Candace Rice[192]. Soft: can be easily scratch with a fingernail; medium: difficult to scratch with a fingernail yet easily scratched with a steel blade; hard: cannot be scratched with a fingernail, difficult to scratch with a steel blade; very hard: cannot be scratched with a steel blade;
- **Inclusions**[193]: inclusions are primarily described by shape and colour, and identifications are sometimes given in brackets. Quantity is described using ›singular‹, ›very rare‹, ›rare‹, ›frequent‹, ›very frequent‹, or ›interspersed with‹[194]. Size is given as: fine (<0.5 mm), medium (0.5–1 mm) or coarse (>1 mm)[195]; sorting is described as ›very good‹, ›good‹, ›fair‹, ›poor‹, ›very poor‹[196];
- **Granulation**: described as ›dense‹, ›slightly porous‹ or ›sandy‹. Transferability and comparability are guaranteed as granulation is combined with standardised descriptions of porosity;
- **Porosity**: the shape of voids is described using ›elongated‹, ›bubbly‹, ›bulged‹, ›cellular‹, ›net-like‹, or ›sponge-like‹[197]; frequency is given as a percentage which is estimated using comparison charts[198].

Preliminary Results of Archaeometric Analyses

75 Ultimately, validation of the macroscopic fabric groups depends on archaeometric analyses, which comprise thin-section petrography (mineralogical composition, raw clay preparation, and firing) and XRF analyses (chemical composition)[199]. A first selection of 130 samples was analysed using a portable X-Ray Fluorescence Spectrometer (pXRF), also to help detect and exclude outliers and contaminated fragments prior to the final sample selection for laboratory analyses[200]. The analyses of the pXRF results will

189 Matrix concerns the overall ›picture‹ of a fresh break; grains that are smaller than 0.01 mm are not (clearly) distinguishable or identifiable under a microscope.

190 Descriptions purposefully summarise the main macroscopic characteristics observed at these three levels, so as to allow, in combination with microscope photographs presented here, identification of these fabrics elsewhere.

191 Munsell Soil Color Chart 2000.

192 Rice 2015, 312 f; compare: Orton et al. 1993, 138.

193 Inclusions are primarily described by shape and colour; in some cases an identification can be given (in brackets), following »FACEM. Provenance Studies on Pottery in the Southern Central Mediterranean«, <https://facem.at/project/about.php#method> (29.02.2024). Also, in the absence of »specialized geological expertise«, Rotroff 1997, 240 f. favours describing inclusions merely in terms of size and colour.

194 As suggested on »FACEM. Provenance Studies on Pottery in the Southern Central Mediterranean«, <https://facem.at/project/about.php#method> (25.08.2023).

195 Compare with Rotroff 1997, 240 f.

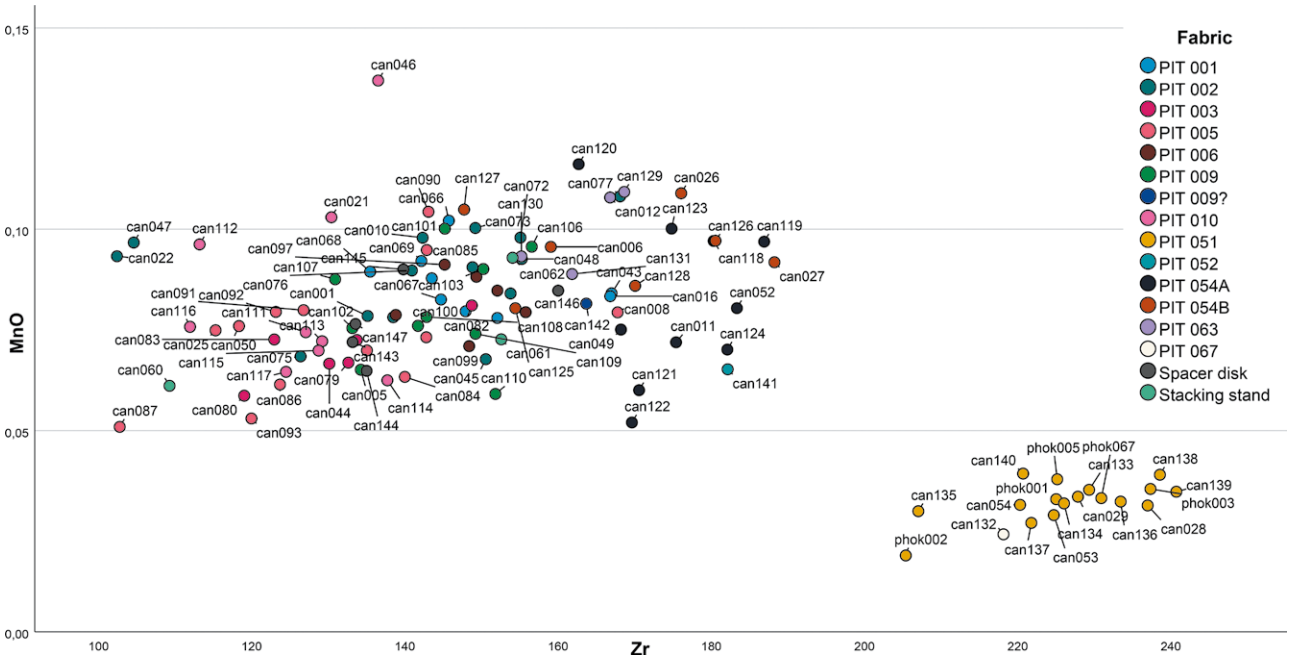
196 Orton et al. 1993, 239 fig. A, 6. Compare Radbauer 2003, 30 fig. 5; Rotroff 1997, 214.

197 Courty et al. 1989, 72 fig. 5, 6. Compare Radbauer 2003, 30 fig. 5.

198 See Flügel 1978, 160 f. Compare Radbauer 2003, 30 fig. 5.

199 Laboratory analyses were conducted by Prof. Dr. Emin Çiftçi (Department of Geological Engineering, Faculty of Mines, İstanbul Teknik Üniversitesi (İTÜ).

200 We are indebted to the colleagues of Physical Geography (Freie Universität Berlin) for permission to use their



27

Fig. 27: Preliminary evaluation of pXRF measurements: biplot of manganese and zirconium

take place in tandem with those of the 66 samples obtained from laboratory analyses[201], yet some preliminary observations can be made: a biplot (Fig. 27) of concentrations of MnO (manganese) and Zr (zirconium) shows a clear clustering of our fabric groups classified as ›local‹ (left) and originating from Phokaia (right)[202]. This implies that the red and reddish-brown PIT 001, PIT 002, PIT 009, and PIT 006 (cf. infra) as well as the pale sandy ESC fabrics PIT 003, PIT 005, and PIT 010 are chemically rather similar – even an interpretation that these derive from raw clays from different layers within the same clay deposit is conceivable. The large cluster on the left in Fig. 27 also includes manufacturing devices such as spacer discs and stacking devices, which thus provides preliminary albeit significant information that these tools were manufactured from the same raw clay material that was used for the manufacture of tablewares proper. Furthermore, the biplot clearly shows that LRC vessels manufactured at Pitane (PIT 054) and at Phokaia (PIT 051) can be distinguished chemically, which fully confirms our macroscopic classification. This not only forms a basis for determining the locally produced repertoire, but also has the potential to guide the search for raw clay deposits within the Pergamene micro-region. In the future, this should assist colleagues in their identification and classification, which will in turn help to improve our understanding of the distribution of ESC and in particular of LRC manufactured in Pitane.

ESC

76 Fabrics PIT 001–010 are considered to represent locally produced ESC (cf. supra). This fabric range includes the well-known light red to light reddish-brown fabrics associated with Çandarlı (PIT 001, PIT 002, and PIT 007), which otherwise closely resemble other fabrics within the Pergamon micro-region: in fact, products from Pitane, the Ketios

pXRF (Niton XL3t 900S GOLDD). Each sample was measured 3 times at 3 different spots (fresh breaks) using the Mining Cu/Zn-mode (Set 1=ModCF 8mm). Dr. Lars Heinze (ArchaeoConnect GmbH), whom we owe our sincere gratitude, statistically evaluated the measured data in Pergamon prior to our final sample selection for laboratory analysis.

201 These data (pXRF and XRF) are being analysed by Prof. Dr. Dennis Braekmans, Department of Archaeological Sciences, Faculty of Archaeology, Leiden University.

202 Previously determined to be a key distinguishing feature; see, for example, Mayet – Picon 1986, 129–142.

Valley and Elaia can only reliably be distinguished through analyses (cf. supra). A group of very pale sandy fabrics (PIT 003, 005, 010) is included here because of their quantities within the collected material as well as the occurrence of fragments with clear signs of firing defects (e.g. overfiring, discolouration due to kiln stacking)[203]. Fabrics PIT 006 and PIT 009 are tentatively regarded as overfired variants of PIT 001, PIT 002 or PIT 007. An overview of the predominant ESC and LRC fabric groups, with fabric codes and accompanying photographs, was published previously[204], and is elaborated upon here below.

PIT 001

77 Dense, fine, light red to light reddish-brown with a smooth, shiny to very shiny, thin or thick orange or red to reddish-brown slip; rare, fine inclusions (Fig. 28, first row, left). Represented by 1478 fragments/entries.

- Colour. Clay: light red (2.5YR 6/6) to light reddish-brown (5YR 6/6); slip: orange (2.5YR 5/8) to red to reddish-brown (10R 5/8 to 2.5YR 4/8)
- Hardness: medium to hard
- Inclusions. Rare, fine: silver and gold mica (muscovite; biotite), and rare medium to large golden mica, usually better visible at the surface than on a fresh break[205]; white: lime/calcium carbonate?; dark red and dark grey: iron oxide concretions? Sorting: good to fair
- Granulation: dense
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 5 %
- Typological repertoire: Hayes Forms A1, A2, A3 (Fig. 29, 5), A4, A5, A6 (Fig. 29, 4), A7, A9 (Fig. 29, 1), A10 (Fig. 29, 2); Loeschcke Types 1 (Fig. 30, 1), 3 (Fig. 30, 8), 4 (Fig. 30, 10), 6, 7, 9A, 9B, 10, 15, 19, 19 Prototipo, 19 Prototipo A, 20 (Fig. 30, 6), 21, 22 (Fig. 30, 5), 23, 26A, 26B (Fig. 31, 15), 27, 29; ›Çandarlı Ware‹ Hayes Forms 1 (Fig. 32, 1), 1 Prototipo, 2 Prototipo, 3 Prototipo (Fig. 32, 2); ›Çandarlı Ware‹ Hayes Forms 4
- Samples: CAN 065–071

PIT 002

78 Dense to slightly porous, light red to light reddish-brown fabric with a thick and shiny, mostly well smoothened red slip – sometimes rather dull at the exterior, and sometimes with thinly or unslipped areas under the bottom – and rare to frequent, fine to medium inclusions. PIT 002 is similar to PIT 001 but is somewhat more porous and contains both fine and medium inclusions of the same type, and additionally rare medium opaque or white mineral inclusions (Fig. 28, first row, centre). Represented by 2247 fragments/entries.

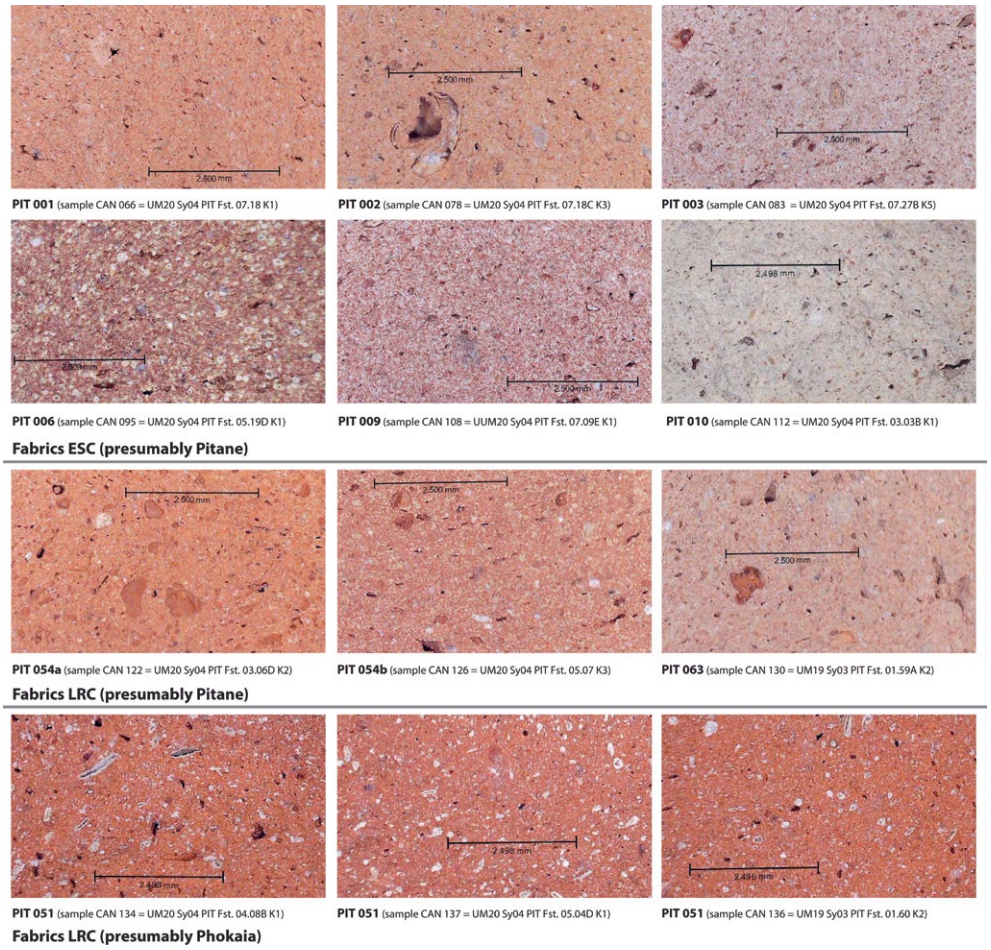
- Colour. Clay: light (2.5YR 6/6) to light reddish brown (5YR 6/6 to 5YR 7/4); slip: red (2.5YR 4/6 to 2.5YR 4/8)
- Hardness: medium to hard
- Inclusions. Rare to frequent, fine to medium: silver and gold mica, sometimes singular medium to coarse golden mica, usually better visible at the surface than on a fresh break; white: lime/calcium carbonate?; dark red and dark grey: iron oxide?; opaque or white: quartz[206]. Sorting: good to fair
- Granulation: dense to slightly porous
- Porosity. Voids: elongated to bulged; frequency: 5 % to 7.5 %; sorting: good to fair

203 A pale raw clay was identified on the Kane Peninsula in 2015 (pers. comm. Helmut Brückner).

204 Bes – Keweloh-Kaletta 2024, 228 fig. 13.

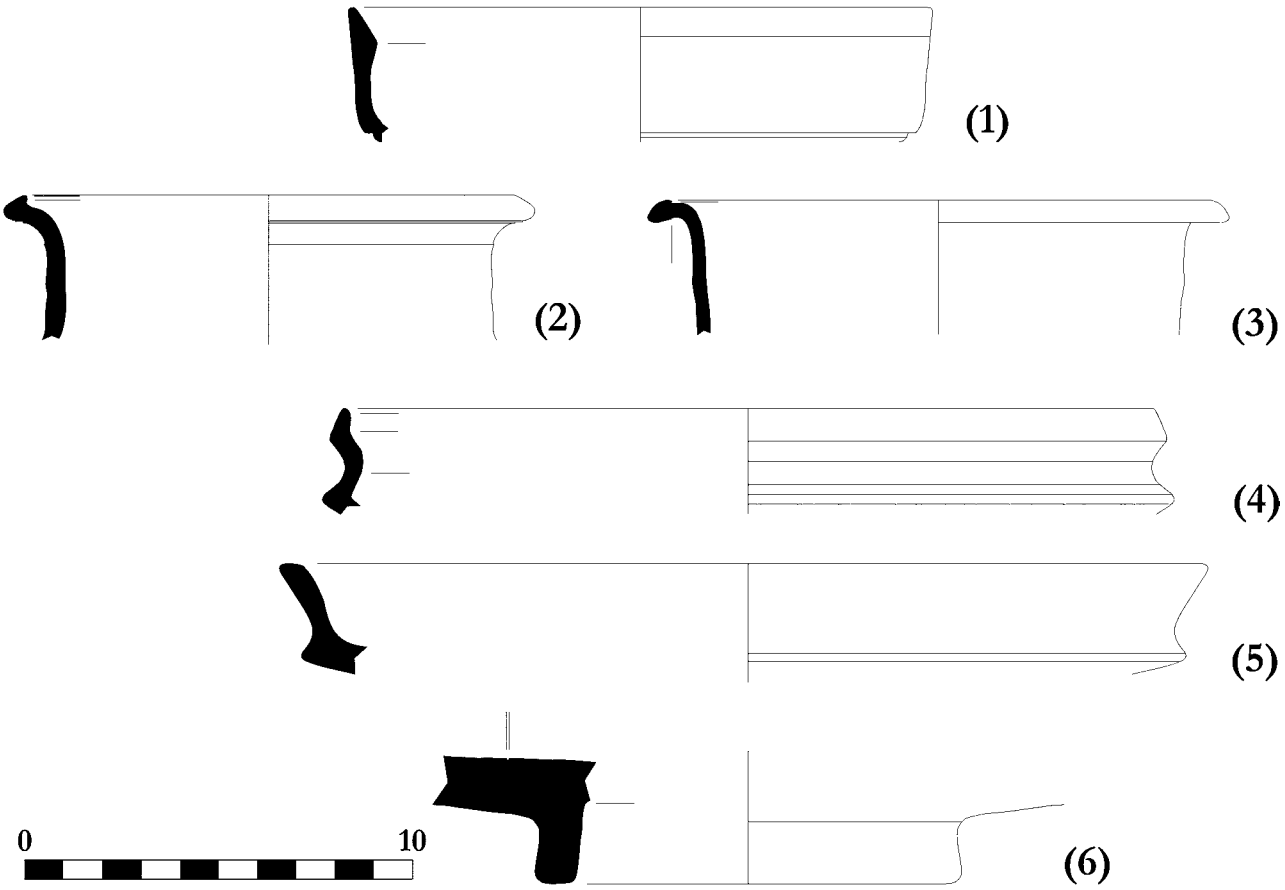
205 Hayes 1972, 316.

206 Quartz is used as an umbrella term for quartz and feldspar, as these »are not distinguishable by optical microscopy and therefore simply summarized under quartz and may occur in different colors«: <https://facem.at/project/about.php#method> (25.08.2023).



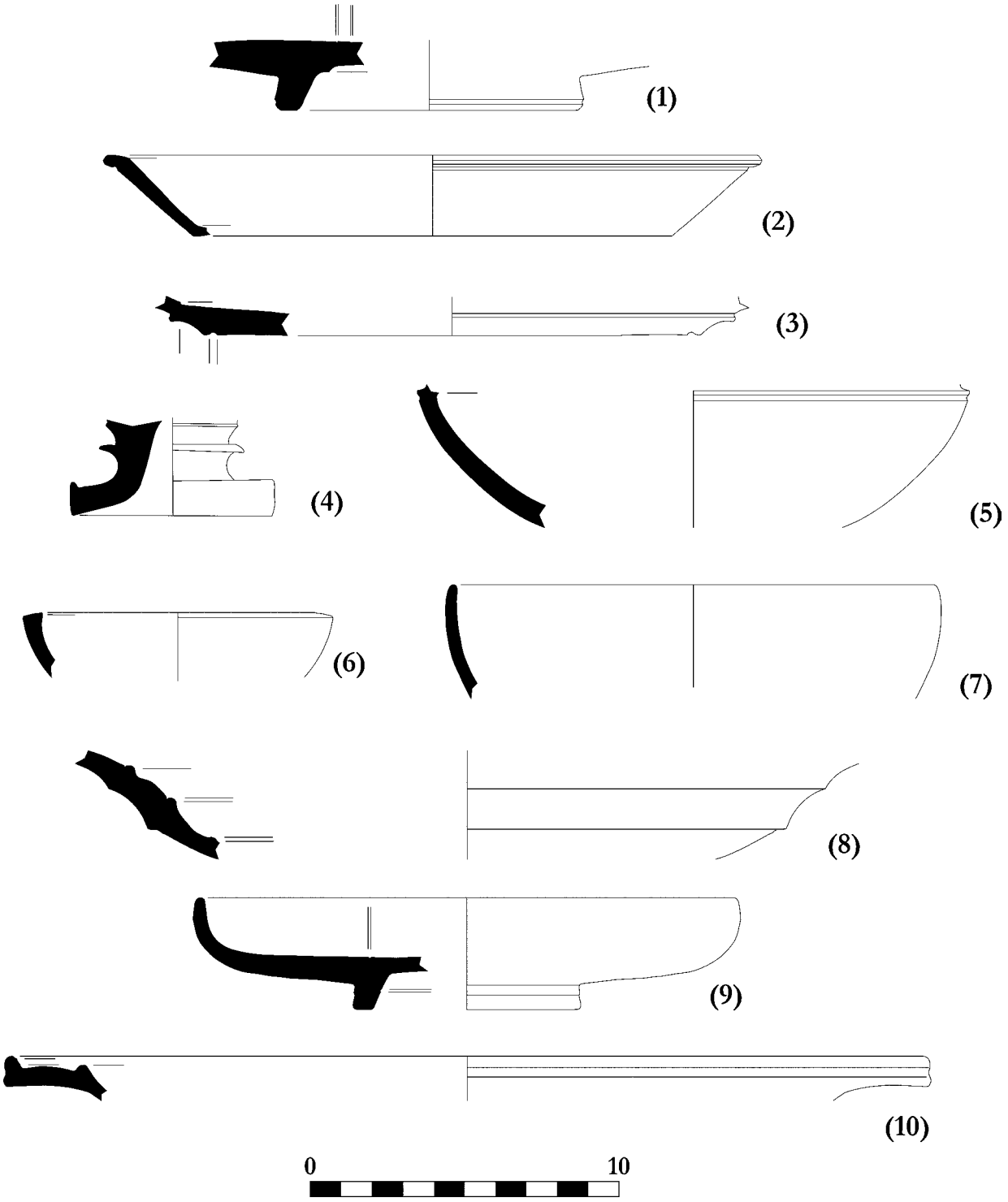
28

Fig. 28: Microscope photographs of macroscopically classified sampled fabric groups



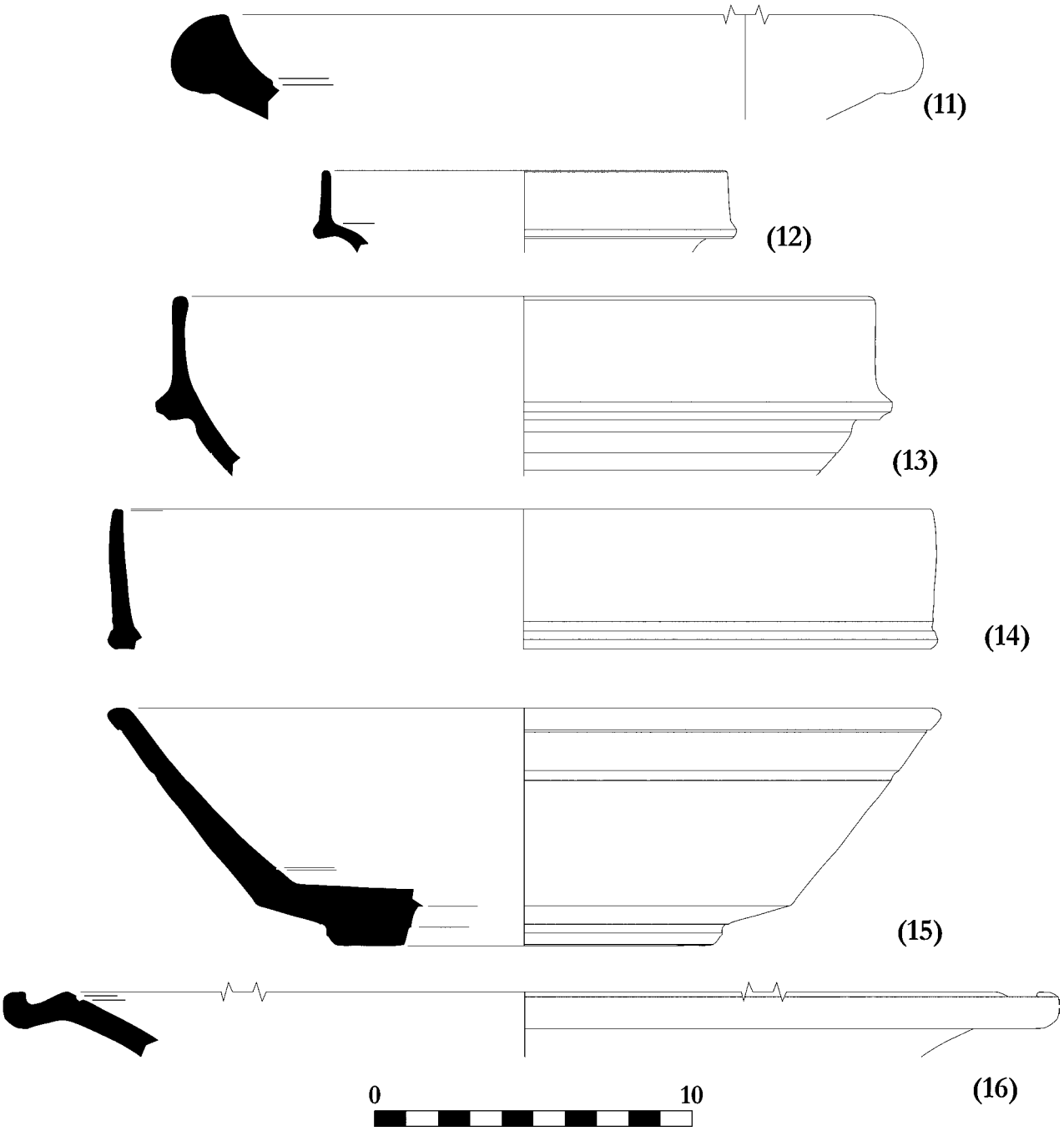
29

Fig. 29: ESC types classified by Hayes as his »serie augustea«. (1) Inv. UM20 Fst. 07.09 K 1; (2) Inv. UM20 Fst. 07.23A K 3; (3) Inv. UM20 Fst. 03.14 K 1; (4) Inv. UM20 Fst. 07.20 K 1; (5) Inv. UM19 Fst. 01.57A K 2; (6) Inv. UM19 Fst. 01.06A K 2 (presumably this type)



30

Fig. 30: ESC types of the ›Loeschcke series‹ well attested in the survey material. Some are corrected drawings – typologically, stylistically – from those published in Bes – Keweloh-Kaletta 2024, 219 figs. 3. 4. (1) Inv. UM19 Fst. 01.01A K 1 (hybrid A3/Loeschcke Type 1?); (2) Inv. UM20 Fst. 05.26C K 5; (3) Inv. UM19 Fst. 01.54 K 1; (4) Inv. UM20 Fst. 06.17 K 1; (5) Inv. UM19 Fst. 01.56 K 1; (6) Inv. UM19 Fst. 01.57A K 1; (7) Inv. UM20 Fst. 03.02E K 2; (8) Inv. UM20 Fst. 05.18 K 1; (9) Inv. UM20 Fst. 03 K 1; (10) Inv. UM20 Fst. 07.25A K 2 (presumably (related to) this type)



31

- Typological repertoire: Hayes Forms A2, A3, A4, A5, A6, A7, A9, A10; Loeschcke Types 1, 2 (Fig. 30, 3), 6 (Fig. 30, 9), 7 (Fig. 31, 11), 8, 9A, 9B, 10, 15, 19 (Fig. 31, 14), 19 Prototipo, 19 Prototipo A, 19 Prototipo tardo, 20, 21 (Fig. 30, 7), 23, 26A, 26B, 27, 29; ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo ›Çandarlı Ware‹ Hayes Forms 4 (Fig. 32, 4)
- Samples: CAN 072–078

Fig. 31: ESC types of the ›Loeschcke series‹ well attested in the survey material. Some are corrected drawings – typologically, stylistically – from those published in Bes – Keweloh-Kaletta 2024, 219 figs. 3. 4. (11) Inv. UM19 Fst. 02.20A K 1 (diam. 54 cm); (12) Inv. UM20 Fst. 05.25D K 5; (13) Inv. UM20 Fst. 07.18D K 3; (14) Inv. UM20 Fst. 03.14 K 2; (15) Inv. UM20 Fst. 09 K 1; (16) Inv. UM20 Fst. 07.09E K 1 (diam. 40.4 cm)

PIT 006

79 Dense to slightly porous, weak red, reddish brown to brown fabric dispersed with rare to frequent, fine to medium inclusions, and a thick, dull to shiny red to dark red or dark reddish-grey slip. Clear signs of overfiring: darker slip colour, discoloration, specimens with a thick white layer of yellowish white depositions (due to firing?),

warped rims, bloating, vitrification. Presumably overfired PIT 002 (Fig. 28, second row, left). Represented by 206 fragments/entries.

- Colour. Clay: weak red (2.5YR 4/4), reddish brown (2.5YR 5/4 to 5YR 5/4-4/4) to brown (7.5YR 5/4); slip: red (2.5YR 4/6), dark red (10R 4/3-4/4 to 2.5YR 3/4-4/4) to dark reddish brown (5YR 4/2-4/4; 10R 4/4) and dark reddish-grey (2.5YR 3/1)
- Hardness: hard to mostly very hard
- Inclusions. Scattered, fine to medium white and yellow: lime/calcium carbonate?; rare to frequent, fine to medium: silver and gold mica; dark red and dark grey: iron oxide? Sorting: good to fair
- Granulation: dense to slightly porous
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 7.5 %; sorting: good to fair
- Typological repertoire: Hayes Forms A3, A6; Loeschcke Types 6, 9A, 9B, 19, 19 Prototipo, 19 Prototipo A, 19 Prototipo tardo, 20, 21, 23, 26A, 26B, 29; ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo; ›Çandarlı Ware‹ Hayes Forms 4
- Samples: CAN 094–099

PIT 009

80 Dense light red to light reddish brown or pale reddish-brown fabric dispersed with fine white and rare fine inclusions, and a thick and shiny, mostly well smoothened red slip, sometimes very shiny, sometimes rather dull on the exterior – thin or unslipped areas under the bottom can occur. Despite the dispersed fine white inclusions, and dark red and dark grey inclusions being slightly more frequent which could have resulted from a higher firing temperature if not overfiring, PIT 009 is close to PIT 001. Some specimens show signs of overfiring on their exterior: partially discoloured or blackened slips indicative of vessel stacking (Fig. 28, second row, centre). Represented by 100 fragments/entries.

- Colour. Clay: light red (2.5YR 6/4-6/6) to light reddish brown (5YR 6/4-6/6) or pale reddish brown (5YR 7/4); slip: red (2.5YR 4/6 to 4/8)
- Hardness: medium to hard
- Inclusions. Scattered, fine white: lime/calcium carbonate?; rare to frequent, fine: silver and gold mica; dark red and dark grey: iron oxide? Sorting: good to fair
- Granulation: dense
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 5 %; sorting: good to fair
- Typological repertoire: Hayes Forms A3, A10 (Fig. 29, 3); Loeschcke Types 1, 10, 15, 19, 19 Prototipo (Fig. 31, 13), 19 Prototipo A, 19 Prototipo tardo, 20, 26A, 26B, 27 (Fig. 31, 16); ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo; ›Çandarlı Ware‹ Hayes Forms 4
- Samples: CAN 100–109

81 Macroscopic fabrics PIT 001 and PIT 002 differ only in density as well as in the amount and size of inclusions and voids. Whereas the quality and colour of the slip, which slightly varies, does not seem to correlate strictly with either PIT 001 or PIT 002, it does appear that PIT 001 occurs more often in early ESC, being the Augustan and Loeschcke type series, whereas PIT 002 occurs more often in the Hayes series, in particular Form 4. Therefore, Hayes' observation that the smooth, shiny to very shiny, thin or thick, orange or red to reddish-brown slip (typical for PIT 001) is associated with the earlier typological series, whereas the thick and shiny red slip, sometimes being rather dull at the exterior (typical for PIT 002) is associated with the later typological series[207], can only tentatively be confirmed based on the material collected by the Pitane

207 Hayes 1972, 316 assigns the »lustrous orange or orange-red gloss« to 1st-century ESC, and a »red-brown,

Survey. Also given the interpretive limitations dictated by survey pottery, additional study is required to entangle the frequencies of these main fabrics and their relation to the various types. Hayes describes »the occasional appearance in the clay of large flakes of golden mica«[208], present in both PIT 001 and PIT 002, as the distinguishing characteristic of the Çandarlı fabric. It is important to emphasise, however, that archaeometric analyses have shown that medium to coarse golden mica also occurs in pottery assigned to the Ketios Valley workshops. Therefore, this feature should be considered a characteristic of the Pergamene micro-region more generally.

82 Three further, macroscopically rather different groups were distinguished, although preliminary analyses suggest they belong to the local/close-regional repertoire of ESC fabrics.

PIT 003

83 Dense to slightly porous, granular pale ochre to very pale yellow or pale reddish yellow fabric, with rare fine to medium/frequent inclusions and a thick and shiny red slip, sometimes being rather dull at the exterior. Sometimes, nearly none or only some traces of slip are preserved indicating that the slip did not adhere too well (Fig. 28, first row, right). Represented by 200 fragments/entries.

- Colour. Clay: pale ochre (7.5R 7/4) to very pale yellow (10YR 7/3) or pale reddish yellow (7.5YR 7/3); slip: red (2.5YR 4/6-4/8 to 2.5YR 5/8; 10R 5/6-10R 4/6)
- Hardness: medium
- Inclusions. Rare fine to medium inclusions: silver and gold mica; white: lime/calcium carbonate?); rare to frequent, fine to medium dark red and dark grey: iron oxide?. Sorting: good to fair
- Granulation: dense, sandy
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 5 %; sorting: good to fair
- Typological repertoire: Hayes Forms A1, A3, A4, A6, A10; Loeschcke Types 1, 6, 9, 10, 15, 19, 19 Prototipo, 19 Prototipo A, 19 Prototipo tardo, 20, 21, 26A, 26B, 27, 29; ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo (Fig. 32, 3); ›Çandarlı Ware‹ Hayes Forms 4
- Samples: CAN 079–083

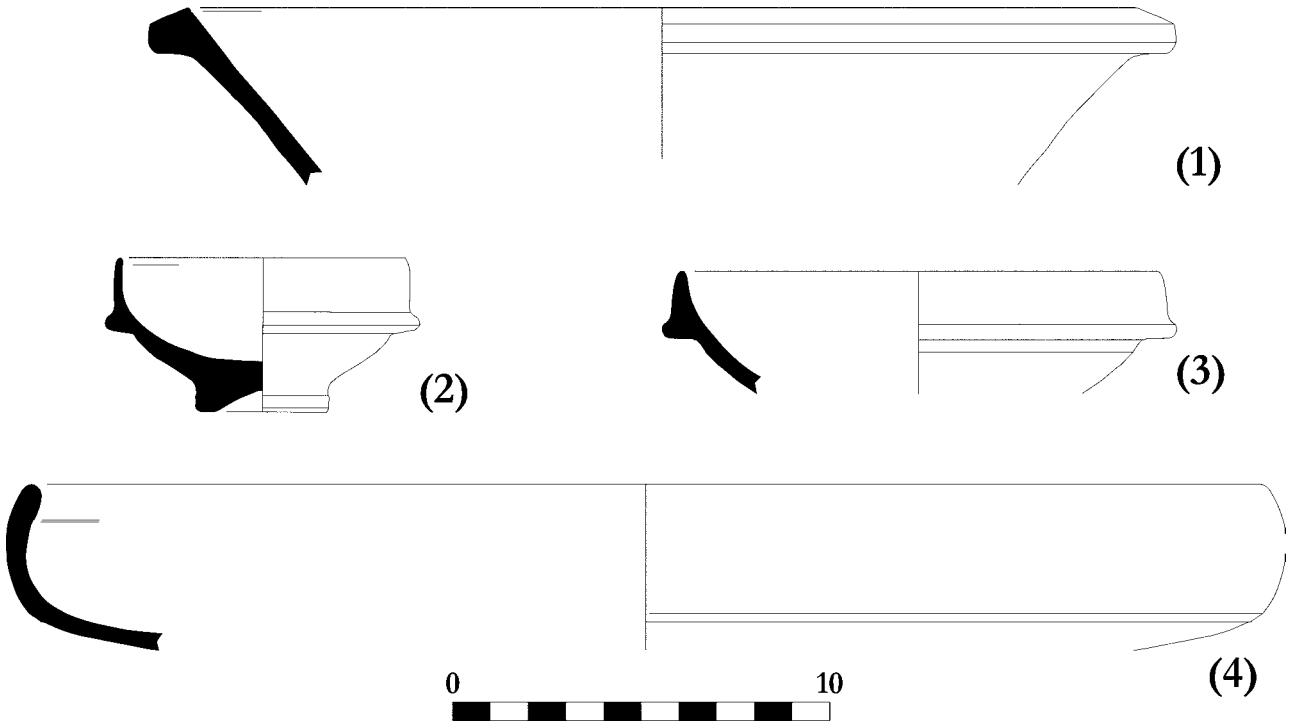
PIT 005

84 Dense to slightly porous, sandy (granular), ochre to pale ochre fabric with rare to frequent fine to medium inclusions, with a thick, shiny to very shiny red to dark red slip, which sometimes is rather dull on the exterior. Criteria for differentiating PIT 005 from PIT 003 are: colour range, the lower quantity of medium dark red and dark brown inclusions, and hardness. Sometimes, nearly no or just a few specks of slip are preserved on fragments classified as PIT 005, which indicates that the slip adhered less well to this sandy fabric than it did to red fabrics such as PIT 001 and PIT 002. Represented by 183 fragments/entries.

- Colour. Clay: ochre (7.5YR 6/4) to pale ochre (7.5YR 7/3-7/4); slip: red (2.5YR 4/6; 10R 4/6-4/8 to 10R 4/6-5/6) to dark red (2.5YR 4/4 to 10R 4/4)
- Hardness: hard
- Inclusions. Rare to frequent, fine to medium: silver and gold mica; white: lime/calcium carbonate?); dark red and dark grey: iron oxide? Sorting: good to fair

maroon or even purplish […] (on the inside, at any rate) […] good gloss« to ESC of the 2nd and 3rd century. Compare: Hayes 1985, 71.

208 Hayes 1972, 316.



32

Fig. 32: ESC types of the ›Hayes series‹. (1) Inv. UM20 Fst. 07.02C K 1; (2) Inv. UM20 Fst. 07.18C K 1; (3) Inv. UM20 Fst. 05.19E K 2; (4) Inv. UM20 Fst. 05.18E K 2

- Granulation: dense, sandy (granular)
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 5 %; sorting: good to fair
- Typological repertoire: Hayes Forms A1, A3 (Fig. 29, 6), A6, A10; Loeschcke Types 1, 6, 9, 10 (Fig. 30, 4), 15, 19, 19 Prototipo, 19 Prototipo A, 19 Prototipo tardo, 20, 26A, 26B, 27, 29; ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo, 4 Prototipo
- Samples: CAN 084–093

PIT 010

85 Dense to slightly porous, sandy, ochre to pale ochre fabric with rare to frequent fine to medium inclusions, and a thick, shiny to very shiny red to dark red slip, which is sometimes rather dull at the exterior. While there are some criteria to tentatively differentiate PIT 010 from PIT 005 – colour range and sandy feel – both are so close that PIT 010 is illustrated by just a single specimen in the fabric overview. Also, some fragments classified as PIT 010 have nearly no slip preserved (Fig. 28, second row, right). Represented by 71 fragments/entries.

- Colour. Clay: pale ochre (7.5YR 7/3-7/4) to pale yellow (10YR 7/4-8/4); slip: red (2.5YR 4/6-4/8; 10R 4/6) to dark red (2.5YR 3/6)
- Hardness: medium to hard
- Inclusions. Rare to frequent, fine to medium: silver and gold mica; white: lime/calcium carbonate?; dark red and dark grey: iron oxide? Sorting: good to fair
- Granulation: dense to slightly porous, sandy (granular)
- Porosity. Voids: elongated to bulged; frequency: 2.5 % to 7.5 %; sorting: good to fair
- Typological repertoire: Hayes Forms A3, A10; Loeschcke Types 6, 9 (Fig. 30, 2), 15/19, 19, 19 Prototipo, 19 Prototipo A, 19 Prototipo tardo, 26A, 26B, 27; ›Çandarlı Ware‹ Hayes Forms 1, 1 Prototipo, 2 Prototipo, 3 Prototipo; ›Çandarlı Ware‹ Hayes Forms 4
- Samples: CAN 111–117

86 Archaeometric analyses (cf. supra) as well as signs of overfiring and stacking failures show that pale fabrics PIT 003, PIT 005 and PIT 010 belong to the locally manufactured repertoire, being evidence for a second group of ESC produced in Pitane, in addition to the well-known light red to reddish brown fabrics PIT 001, PIT 002, PIT 006 and PIT 009. Besides differences in clay colour and texture, another important characteristic of these light fabrics is the poor adhesion of the slip. The quality of the slip nevertheless corresponds to that of the red fabrics in terms of thickness, lustre, and colour. The pale fabrics' typological repertoire matches that of the well-known Pitane ESC fabrics, representing the entire range from Augustan types, the Loeschcke series as well as Hayes' series, including ›Çandarlı Ware‹ Hayes Form 4, which is regarded as transitional to LRC Hayes Form 1, and therefore potentially a key piece in longer-term regional morphological traditions. Thus far, the collected material does not attest local manufacture of LRC forms in any of these pale, sandy fabrics[209]. The number of fragments in light-coloured, sandy fabrics examined here (454) in relation to the number (4031) of fragments in red and reddish-brown fabrics is probably overrepresented (11 %), as a proportionately higher number of fragments of the light-coloured, sandy fabrics was collected for detailed study. Also, in addition to fragments in red and red-brown fabrics listed here, there is a large number of fragments that cannot be assigned to one of these fabrics with certainty (recorded e.g. as PIT 001/002), but which nonetheless belong to the local spectrum of red fabrics.

87 Even if the light-coloured, sandy fabrics from Pitane and the Pergamene microregion have not been much of a focus in research on ESC, there have been researchers who have presented a correspondingly pale, sandy (or granular) fabric which can be assigned to ESC based on the typological repertoire: Michael Zelle, for instance, describes pottery that was typologically classified as ESC as having »einen hellgelben, häufig leicht gekörnten Ton und einen meist dunkelroten, nicht selten sehr guten Firnis« (›a light yellow, often slightly grainy clay and a mostly dark red, often very good slip‹)[210]. Zelle refers to this as »Eastern Sigillata C Gruppe 3«, which comprises 9.4 % of ESC imports at Assos. Zelle considered that his ESC Group 3 was closer to ESC produced in Pergamene workshops (his Group 1) and not in Pitane (his Group 2)[211]. Hence, archaeometric analyses of Zelle's Group 3 and a subsequent comparison with our light-coloured, sandy ESC fabrics would be most valuable. Patricia Kögler also identified small quantities of Zelle's ESC Group 3 in Roman Imperial-period assemblages from Knidos, alongside ESC which she classified as Çandarlı Ware, ergo attributed to Pitane[212]. In Athens, Hayes identified a small number of »Çandarlı forms« which »combines a hard, granular yellow-buff clay with the normal »late« gloss treatment«[213]. Last, it is relevant to mention that fragments attributed to PIT 003, 005 or 010 can be confused fairly easily – especially to the untrained eye – with Eastern Sigillata A (ESA), body sherds in particular. Differences worth highlighting are that the slip on ESA, especially the dark red slip which characterises the earlier phases of production, seems finer and more even in texture, is never as glossy as ESC can be, and also weathers differently.

88 Based on the artefactual evidence and established local ESC macroscopic fabric groups, 15,418 pottery fragments were identified and recorded as locally produced ESC, 5556 of which were studied in detail, while 9592 were tallied by type and sub-

209 An LRC Hayes Form 3 rim (UM19 Fst. 01.34A K 3) in a pale, sandy, fabric resembling PIT 005, deserves further study.

210 Zelle 1997, 21 f., pointing out that the pale fabric corresponds to Meyer-Schlichtmann's »Tongruppe 1« (Meyer-Schlichtmann 1988, 14, describing the colour as yellowish ochre, light ochre to dark ochre), but who does not describe either a granular clay structure or a comparable dark red slip characteristic for his ESC group 3 in Assos.

211 Zelle 1997, 24.

212 Kögler 2010, 380, differentiating Çandarlı Ware from »Pergamenische Sigillata« based on the assumed production period of the respective workshops.

213 Hayes 2008, 51.

sequently brought back to their unit (cf. supra). Furthermore, 3278 pottery fragments were grouped as ESC/LRC: 478 were studied in detail, whilst 2800 were recorded and subsequently returned to their respective unit. This group includes intermediate types, such as plates of Çandarlı Hayes Form 4/LRC Hayes Form 1, as well as the identification of fragments based on properties of fabric and/or slip as far as this could be determined, since many concern overfired specimens or wasters.

89 As mentioned, the 29 types (with type-variants) originally established by Loeschcke[214] were supplemented by Hayes (Forms 1 to 5), and later still with an Augustan series with ›Forma A1–12‹[215]. Hayes' additions to Loeschcke's typology were based either on material found elsewhere in the (Eastern) Mediterranean (especially Athens), or on published material from Pergamene contexts (especially the Asklepieion). Therefore, one of the main aims of our survey was to document the typological repertoire of local ESC based on: (a) vessel wasters of identifiable types; and (b) fragments typologically identifiable in fabrics which are regarded as local (cf. infra). Against this background, Loeschcke's and Hayes' typologies were employed as a basis for typological identification, which were only supplemented by Meyer-Schlichtmann's typology for Pergamene Sigillata[216]. This approach allowed, for the first time, to evaluate Hayes' assignment of further types to Pitane. In order to present the results of this approach, the typological repertoire of ESC produced in Pitane is described below as follows: (1) Augustan ESC, or Forma A1–12, which thus far have only been attributed to Pitane on the basis of material from Pergamene contexts or examples found elsewhere in the Eastern Mediterranean; (2) ESC as defined by Loeschcke (Types 1 to 29); (3) Hayes' later ESC – Forms 1–5 – which thus far were assigned to Pitane merely on the basis of examples from elsewhere in the Eastern Mediterranean; and (4) types previously unknown – or possibly variants of already classified types – yet belonging to ESC. For each of these series, the types proper are briefly characterised, the forms of surface treatment are summarised, and the proportion of these series as part of the total finds collection is indicated. Even if survey material inevitably cannot contribute to the chronology of ESC (dates given here derive from published typologies (cf. supra) or published find contexts), the collected evidence still allows to explore chronological and/or spatial foci regarding ESC and LRC production in Pitane.

90 (1) A total of 206 ESC fragments (65 rims, 114 bases and 27 body sherds), being 1.4 % of the collected ESC, were attributed to Hayes' »serie augustea« (›Augustan series‹[217], Fig. 29). In order to discuss these types in a chronological order, it is important to note that Hayes also included types which according to Pergamene find contexts appeared prior to the Augustan period. For example, drinking vessel A9 (Meyer-Schlichtmann Type Ts 1a = Engels Type A7, Fig. 29, 1) – present in our dataset with just 4 specimens – represents a two-handled drinking cup with a simple ring base, rounded body which ends in a concave segment, and a characteristic straight rim that is thickened on its interior to form a triangle. It is quite common in Pergamene contexts of the mid-1st century B.C. to mid-1st century,[218] and is well attested as Pergamene imports or close imitations in Late Hellenistic contexts elsewhere in the Mediterranean[219]. Calyx Type A10 (= Meyer-Schlichtmann Type Kg 2, Fig. 29, 2. 3),

214 Loeschcke 1912 did not state for each of his types whether these could be matched with vessel wasters. It seems as if he had assumed a priori that all TS in Pitane had to be regarded as locally produced.

215 For his Augustan series, Hayes 1985, 71 specifically relied on ESC which Schäfer (Schäfer 1962) regarded as »lokalpergamenisch«.

216 Meyer-Schlichtmann 1988.

217 Hayes 1985, 73–75.

218 Meyer-Schlichtmann 1988, 83–85; Engels 2021, 49 f. cat. K 66 shows that this is a genuine Pergamene type.

219 For example, in Late Hellenistic contexts in Sardis, see Rotroff – Oliver 2003, 84–86 cat. 338–344.

with a rounded lower part, a long convex upper part and an outturned rounded rim with an interior lid ridge, is represented by 13 specimens[220], yet is not well attested in Pergamene contexts, and can therefore only roughly be dated to the mid-1st century B.C. to mid-1st century as well[221]. The rim diameters of Type A1 (n=4) range from 136 to 200 cm and show that this type with a simple, short base, a flat rounded body and rounded rim can occur both as a plate and as a platter. As Hayes already mentioned, also this type is present in Late Hellenistic contexts in Pergamon[222]. The similar plate Meyer-Schlichtmann Type T 13a is dated accordingly to the mid-1st century B.C. to mid-1st century[223]. Therefore, Types A9, A10 and A1 should rather be dated as Late Hellenistic-Early Roman Imperial rather than Augustan. That said, their limited presence among the fragments cannot be taken as evidence for Late Hellenistic ceramic production in Pitane. In particular, whereas all three types have been recognised in Pitane ESC fabrics (in particular PIT 001 and PIT 002, less frequently so in PIT 003 and PIT 009), no corresponding vessel wasters have been identified (Fig. 24). In some cases, these types have an orange or reddish orange, smooth and very shiny slip, whilst some specimens have a rather dull slip. Especially the occurrence of drinking vessel A9 is quite elusive, since Hayes stated that it represents »an uncommon shape not present at the Çandarlı kilns«[224].

91 The shallow plate Type A2 with a very flat ring base (4 specimens, 2 being uncertainly ascribed), which finds its closest parallel in Meyer-Schlichtmann's Types T 15–16[225], as well as the closely related flat-bottomed bowl Type A8 (2 specimens, both uncertain identifications), its closest parallel being Meyer-Schlichtmann Type N 22, with outturned, flat rim, slightly profiled at the upper end, is more difficult to date using Pergamene contexts because of the type's scarcity there. Still, a date in the late 1st century B.C. to mid-1st century[226], or an Augustan-Tiberian date, is most plausible. Both types occur in PIT 001 and PIT 002 yet have not been identified as vessel wasters. The flat-bottomed plate A4 with a low, inclined wall that ends in a grooved lip, is regarded as an Augustan predecessor of Loeschcke Type 9[227]. Most of the 9 representatives of this type in our material occur in PIT 001 and PIT 002, while one occurs in PIT 003.

92 The thin-walled bowl Type A5[228] with a rounded, slightly sloping wall and offset rim, is the oldest of the arretina-style types[229] of the »serie augustea«. Thirteen specimens were collected which have all been attributed to PIT 001 except one (in PIT 002), and in some cases have an orange, smooth and very shiny slip. Since the collected material includes no vessel wasters of Type A5, one specimen is selected for archaeometric analysis (sample CAN 067), to look into the question whether this type was locally manufactured.

220 As the rim is similar to Loeschcke Type 10, which has a profiled foot and concave upper wall, there can be some overlap in assigning rim fragments.

221 Meyer-Schlichtmann 1988, 168.

222 Hayes 1985, 73 referring to Schäfer 1962.

223 Meyer-Schlichtmann 1988, 140 f.

224 Hayes 2008, 51 fig. 24, 772 (P 16717) 24, 773 (P 5644), suggesting that this type derived from metalware and is close to Italian thin-walled types.

225 The prototipo Hayes illustrated (Hayes 1985, pl. XVI, 2) is from a probable Augustan context in the Asklepieion (Ziegenaus – De Luca 1968, 157 pls. 56. 66. no. 369).

226 For his Type T 16, Meyer-Schlichtmann 1988, 103. 141 f. refers to parallels from contexts of the 1st century from Tarsus and Athens.

227 The prototipo Hayes illustrated (Hayes 1985, pl. XVI, 2) was found in the same, probable Augustan context from the Asklepieion as the prototipo of Type A2 (Ziegenaus – De Luca 1968, 157 pl. 66 no. 373).

228 The prototipo Hayes illustrated (Hayes 1985, pl. XVI, 6) comes from the Asklepieion (Ziegenaus – De Luca 1968, 158 pl. 56. 67 no. 384).

229 Compare Consp. 8 (Ettlinger et al. 1990, 66 f.) or ESB Atlante Form 23.

93 Finally, we turn to those types of the »serie augustea« that are most frequent among the collected fragments, namely, arretina-style plates and bowls with concave or vertical rims (»Steilrandschüsseln« or »Steilrandteller«; ›vertical-rimmed bowl/plate‹) which are thought to have been inspired by Augustan to Tiberian/Claudian Italian Sigillata Consp. 17 and Consp. 18–20 respectively[230]. Both type-groups are well-attested in Pergamene ESC[231], including among the material from the Ketios Valley workshops[232]. The thin-walled, sharply accentuated bell-shaped bowl ESC Type A6 (= Meyer-Schlichtmann Type N 40, Fig. 29, 4) with concave rim and either a simple ring base or a profiled base, is represented by 41 specimens, of which 13 could be assigned to subtype A6a and 10 to subtype A6b. Most specimens belong to PIT 001, often have a very smooth and shiny red or orange slip, and sometimes are unslipped within the ring base[233]. A further 5 specimens belong to PIT 002 and PIT 006 each, and 4 specimens are assigned to PIT 003 and PIT 005. Type A6 is not only regarded as having been locally made because of the fragments' fabric attribution, also, a vessel waster and an overfired fragment were identified – in both cases body sherds, but their attribution is rather secure. The thin-walled, sharply accentuated bell-shaped ESC bowl A7 (= Meyer-Schlichtmann Type N 39) with vertical rim, which Hayes regarded as the forerunner of Loeschcke Type 15, is attested with just 9 specimens. However, local manufacture is secured because of the fragments' attribution to PIT 001 and PIT 002, and the identification of a vessel waster rim and an overfired rim fragment[234]. With 47 %, plates with vertical rim Type A3 (= Meyer-Schlichtmann Type T 31, Fig. 29, 5. 6) constitute the lion's share of fragments assigned to the ›serie augustea‹. This percentage, however, must be treated with some caution, since just 13 rims were identified; the remainder comprises body sherds (n=16, showing the transition between bottom and rim) and bases (n=78). In fact, bases of this type are either very low or high and heavy and may not always be easy distinguished from other ESC plate and/or bowl bases. Furthermore, the disproportion of bases compared to rims of this type is further reason for caution[235], inevitably also reducing the epistemic value of the 8 vessel wasters attributed to this type. A single overfired rim attributed to Type A3 offers a modest albeit significant clue that this type was locally manufactured – again, fragments occur mainly in PIT 001 and PIT 002, a few in PIT 003 and PIT 005. To conclude considerations on the Augustan series, certain types which Hayes listed are not represented in the survey material: the thin-walled beaker A11 is absent, which did not come as much of a surprise, as this shape also does not feature among other ESC from the Pergamene micro-region known to date. For now, we tentatively conclude that this type was not produced at Pitane. Given the current state of knowledge, the same is true for calyx Type A12, a decorated variant (for having appliqué decoration) of calyx Loeschcke Type 10[236].

94 (2) A total of 8740 fragments (3095 rims, 4343 bases[237], 28 handles and 1274 body sherds[238]) were attributed to types of the ›Loeschcke series‹ (Figs. 30. 31). This repertoire will be described in less detail; the main aim here is to discuss whether corresponding types are represented by vessel wasters and/or their attribution to the

230 Ettlinger et al. 1990, 80–86.

231 Schäfer 1962, 791 fig. 1 no. 21; Meyer-Schlichtmann 1988, 112–114. 151 f. pls. 13. 19.

232 Bounegru et al. 2001, 158 fig. 10.

233 Compare: Hayes 2008, 51 fig. 24, 774 (P 3564).

234 Compare: Hayes 2008, 51 fig. 24, 775 (P 18297) 24, 776 (P 32175).

235 If some of these bases are of later types, this would inevitably reduce the overall proportion of the »serie augustea« in the ESC repertoire as collected during the survey.

236 Schäfer 1962, 33–35 fig. 4 brought this type into the discussion as being »lokalpergamenische Sigillata«.

237 The high number of bases here can be explained by the fact that bases of carinated bowls Loeschcke Type 26 are rather easily recognisable, as are body sherds, thus prone to cause a bias in the proportion of this type.

238 To a significant degree, the high number of body sherds is caused by the diagnosticity of flange fragments of bowls Loeschcke Types 15 and 19, which also here causes a bias in their representation.

repertoire of macroscopic local fabrics, to give a generic picture of their quantities in the overall ESC repertoire, and gain some insight into chronological foci of local ESC production.

95 Starting with those types that were already mentioned above: Loeschcke Type 1[239], represented with 90 fragments (17 rims, 34 bases and 39 body sherds), is a shallow plate with vertical rim (»Steilrandteller«) and ring base, that strongly resembles the already mentioned plate A3, which is quite common in Pergamene ESC[240]. A partially overfired base offers a clue for this type's local production; more significant is its occurrence mainly in PIT 001, PIT 002, PIT 006 and PIT 009, and a few in PIT 003 and PIT 005. Compared to plate Type A3, many fragments classified as Loeschcke Type 1 have a shiny orange to reddish orange slip, which often is very well smoothened. Some bases carry a double concentric circle or circular rouletting on their interior, which seems a characteristic decorative feature[241] (Fig. 30, 1). Whether plate Loeschcke Type 6 (Fig. 30, 9) concerns a later stage in the morphological development of plate A3, as Hayes has stated, cannot be decided without stratigraphic control, which also concerns Loeschcke's suggestion that his Type 6 rather postdates the Augustan period because of its profile being simpler and less sharply profiled compared to similar Arretina types from Haltern[242].

96 Plate Loeschcke Type 9, with a flat or slightly inclined bottom and a low, inclined wall which ends in a grooved lip, regarded as a later version of plate Type A4[243], is well-attested in the collected material with 220 specimens. Both type-variants Loeschcke Type 9a (Fig. 30, 2), having a simple line below the rounded rim, as well as Loeschcke Type 9b, with a slightly flaring and thickened flat rim, are attested[244]. These plates can have a shiny, smooth orange to orange-red slip or a thick and shiny red slip, which could mean that such slips continued from the 1st century onwards, as Loeschcke had suggested (cf. supra)[245]. Local production of Loeschcke Type 9 seems secure: it occurs mainly in PIT 001 and PIT 002, yet rarely in PIT 003 and PIT 005, and a vessel waster as well as overfired rims and an overfired base were noted. Loeschcke Type 2 (Fig. 30, 3), which is very similar, was interpreted by Loeschcke as a platter because of its slightly larger dimensions, which does not seem very convincing concerning the specimen he illustrated[246]. The 4 fragments assigned to this type are more likely to be assigned to Type 9; as a result, Loeschcke Type 2 probably needs to be ruled out as a type that was produced in Pitane.

97 A deeper, steeper version of plates with flat or slightly inclined bases, Loeschcke Type 8 (= Meyer-Schlichtmann Type T 8), attested in Pergamon in contexts of the 1st century B.C. and A.D.[247], is represented by just 16 specimens in local fabrics. Since none of these fragments bear any sign of overfiring, local production is conjectural. The same holds true for bowl Loeschcke Type 16[248], a bowl also with a flat or slightly inclined base, and an inclined body with a rounded transition that ends in an offset vertical rim –

239 Loeschcke 1912, 360–362.

240 Meyer-Schlichtmann 1988, 151 f. pl. 19; Bounegru et al. 2001, 158 fig. 10.

241 Compare Hayes 1985, 75 f. pl. XVI, 16 (= Hayes 2008, 51 fig. 24, 768 (P 22324).

242 Compare Hayes 1985, 75 f.; Loeschcke 1912, 362.

243 Loeschcke 1912, 365 f.

244 Compare Meyer-Schlichtmann plate Type T 23 (Meyer-Schlichtmann 1988, 145 f. pl. 18, 298).

245 Loeschcke 1912, 365. Hayes 1985, 76 suggested that this plate type still occurred in the 2nd century, which was later supported by the occurrence of such plates in Pergamene contexts that have been dated to the 2nd century (Meyer-Schlichtmann 1988, 145).

246 Loeschcke 1912, 362 f. pl. 28, 2.

247 Loeschcke 1912, 364 f. pl. 28; Schäfer 1962, 787 fig. 1, 7 nos. 6–8. Meyer-Schlichtmann 1988, 135 f.

248 Loeschcke 1912, 370 pl. 28, 16.

comparable to ESB Atlante Form 73[249] – which is attested with only 3 rims (one uncertain in its attribution) in PIT 001 and PIT 005.

98 With 76 assigned fragments, calyx Loeschcke Type 10[250] (Fig. 30, 4) is surprisingly well attested (13 rims, 27 bases, 36 body sherds). These chalices have a high, moulded foot, a stem and semicircular body, which in turn – set off by one or more grooves – merges into a straight or slightly flaring rim with an interior lid ledge. Such chalices are not well attested in Pergamene contexts, yet can be associated with Meyer-Schlichtmann's Type Kg 2 and dated roughly to the mid-1st century B.C. to mid-1st century.[251] Local production in Pitane is not archaeologically attested given the absence of vessel wasters or overfired specimens, yet, the occurrence of chalices especially in PIT 001 and PIT 002 (rarely in PIT 003 and PIT 005) does offer strong hints. It is noteworthy that 15 fragments of Loeschcke Type 23, hemispherical lids with a gently flaring lip and a profiled knob[252], which are associated with these chalices, were also identified in local fabrics, again though not as vessel wasters or overfired specimens. Both types can have an orange to reddish orange, shiny slip, while some fragments bear a slightly shiny to rather dull red slip or a shiny, thick dark red slip.

99 Besides those types directly connected with the »serie augustea«, the ›Loeschcke series‹ comprises types that chronologically belong to the same date range: for example, bowls Loeschcke Type 22[253] (= Meyer-Schlichtmann Type N 36[254], Fig. 30, 5), with a simple ring base or simple profiled base, hemispherical body and a rim which turns inwards at a slight angle and is offset from the body by one or two grooves. According to Meyer-Schlichtmann, this type is present in Pergamene contexts of the mid-1st century B.C. till the mid-2nd century[255]. Loeschcke Type 22 is present in the survey material with only 7 fragments, in PIT 001 and PIT 002; with no vessel wasters or overfired specimens, a local production in Pitane can neither be proven nor ruled out.

100 Simple hemispherical bowls with ring bases are well attested within the collected material: especially Loeschcke Type 20[256] (Fig. 30, 6) with a smooth edge (sometimes slightly faceted) below the sharply rounded rim, occurs in PIT 001, PIT 002, PIT 006 and PIT 009 with 156 fragments, which combined with 4 overfired fragments and 1 waster strongly speak in favour of local production. This is significant, as this type is represented in Pergamene find contexts but also elsewhere in the Mediterranean, e.g. in Pompeii and Corinth, datable to the mid- to late 1st century B.C.[257]. The larger version of this hemispherical bowl, Loeschcke Type 21 (Fig. 30, 7), is represented by 41 fragments in local fabrics, though vessel wasters or overfired fragments were not identified. The prevalent slip on both latter types ranges from a rather dull orange, reddish orange to red and can be smooth and shiny or very shiny. Loeschcke Type 17, a similar bowl with a flat base, is attested with only 6 fragments; since the attribution of Loeschcke Types 20 and 21 is based on rims, this disregards whether the base is a ring base or flat. Therefore, we can neither rule out nor assume that Loeschcke Type 17 was produced in Pitane.

249 Hayes 1985, pl. XV, 5.

250 Loeschcke 1912, 366 f. pl. 28, 10. Loeschcke 1912, 366 suggested a date prior to the mid-1st century.

251 Meyer-Schlichtmann 1988, 168.

252 Loeschcke 1912, 372 pl. 28, 23, named »Stülpdeckel-Napf«.

253 Loeschcke 1912, 371 pl. 28, 22.

254 Meyer-Schlichtmann 1988, 110 f. pl. 13, 177 cat. 176–178.

255 Meyer-Schlichtmann 1988, 111, referring for example to Ziegenaus – De Luca 1968, 159 pls. 56. 67 no. 188.

256 Loeschcke 1912, 371 pl. 28, 20.

257 Hayes 1985, 76 f.; Hayes 2008, 51 fig. 24, 779. Most closely Meyer-Schlichtmann Type N 12 (Meyer-Schlichtmann 1988, 98 pl. 11 cat. 136), which is prevalent in Pergamene contexts from the 1st century B.C. till the mid-1st century. Meyer-Schlichtmann 1988, 98, contrary to Hayes' classification, favoured to parallel Loeschcke Type 20 with his simple, hemispherical bowl Type N 1 without a smooth, sometimes slightly faceted edge.

101 The rather thin-walled jar Loeschcke Type 13[258], a type quite common in the repertoire of thin-walled pottery, is represented with 1 fragment, which possibly rules out local production of this type. The same is true for some early types that are not represented at all: the thin-walled beaker Loeschcke Type 14[259] and drinking cup Loeschcke Type 12[260]. Other types that are attested in very small quantities were potentially not locally manufactured either: plates Loeschcke Types 3[261] (n=4, Fig. 30, 8), 5[262] (n=1) and 25[263] (n=2).

102 Plate Loeschcke Type 6[264] (= Meyer-Schlichtmann Type T 3[265], Fig. 30, 9), with a slightly incurved rim and either a low, sometimes tapered, or more frequently a high, straight ring base, is surprisingly well attested with 277 fragments: 122 rims, 151 bases, and 4 body sherds. The rim sometimes is slightly facetted similar to Loeschcke Types 20 and 21[266]. Some bases preserve a double-outlined concentric circle or circular rouletting on their interior. Local production can be supposed based on quantity and its occurrence mainly in PIT 001, PIT 002, yet very rarely PIT 003 and PIT 005, but also by 3 overfired rims and a single vessel waster (a base), as well as 1 further vessel waster, a base which was documented as a hybrid of Loeschcke Type 6 and ESC Hayes Form 4. In some cases, the slip is very well smoothened and shiny orange to reddish orange. While Hayes proposed a time span of this type from the mid- to late 1st century, Meyer-Schlichtmann pointed out that the occurrence of this type may have continued into the early 2nd century[267].

103 Noteworthy is the presence of a variety of platters. These belong either to Loeschcke Type 4[268] (n=6, Fig. 30, 10), 7[269] (n=5, Fig. 31, 11) or as yet unclassified platters (n=25, Fig. 33, 3). Even if there is just a single overfired, unidentified platter fragment, the occurrence of platter fragments in PIT 001, PIT 002, and PIT 006 makes their local production in Pitane plausible.

104 To conclude the observations concerning the ›Loeschcke series‹ present in our dataset, the most common types are flanged bowls of Loeschcke Types 15 and 19 and carinated bowls of Loeschcke Type 26. Since it is far beyond the scope of presenting the full range in morphological and chronological variation of the flanged and carinated bowls, merely the most important observations regarding these main types of ESC production in Pitane are summarised here.

105 The typological development of the most typical version of the flanged bowl, Loeschcke Type 19 and its subtypes (Fig. 31, 13. 14), can be traced back to the sharply profiled arretina-style ESC bowl Type A6 with concave rim and ESC bowl Type A7 with vertical rim, both being Augustan to Tiberian/Claudian in date (cf. supra). The latter can with some degree of certainty be regarded as the direct forerunner of the early version of the flanged bowl, Loeschcke Type 15 (Fig. 31, 12)[270], which on its interior is still offset in a faceted manner as Type A7, while showing an exterior flange below the vertical rim. Important is that Hayes placed the early flanged bowl Loeschcke Type 15 in the early series of Pitane which were dated by contexts at the Athenian Agora to the mid- to

258 Loeschcke 1912, 369 pl. 28, 13.
259 Loeschcke 1912, 369 pl. 28, 14.
260 Loeschcke 1912, 368 f. pl. 28, 12.
261 Loeschcke 1912, 362 f. pl. 28, 3.
262 Loeschcke 1912, 362 f. pl. 28, 5.
263 Loeschcke 1912, 373 pl. 28, 25.
264 Loeschcke 1912, 363 f. pl. 28, 6; Hayes 1985, 75 f.
265 Meyer-Schlichtmann 1988, 134 f. pl. 17 cat. 261–264.
266 See Hayes 1985, pl. XVII, 1.
267 Hayes 1985, 75 f.; Meyer-Schlichtmann 1988, 134 f.
268 Loeschcke 1912, 362 f. pl. 28, 4.
269 Loeschcke 1912, 364 pl. 28, 7.
270 Loeschcke 1912, 369 f. fig. 28, 15; Hayes 1985, 76 pl. XVII, 4.

late 1st century[271]. In total, just 31 fragments (9 rims, 4 bases and (with doubt, cf. supra) 18 bases) were assigned to Loeschcke Type 15. Again, mainly the red macroscopic fabrics PIT 001 and PIT 002 are represented whereas the pale, sandy fabrics PIT 003 and PIT 005 are rare for Loeschcke Type 15. This is nonetheless noteworthy, since this not only hints at local production (besides a single, slightly overfired fragment), but also gives a clear chronological indication for the usage of PIT 003 and PIT 005. Another 11 rims and 13 flange fragments can be regarded as intermediate between Loeschcke Type 15 and the later, fully developed Loeschcke Type 19[272]. Despite the small number of fragments attributed to the early flanged bowl Loeschcke Type 15, they point to a local typological development which led to the fully developed flanged bowl Loeschcke Type 19 (= Meyer-Schlichtmann Type N 33)[273]. Nonetheless, there is no doubt that the flanged bowl, one of Pitane's ESC flagships, is closely related to Italian Sigillata Consp. 34, but unlike the latter it was never decorated with appliqués[274].

106 In our material, Loeschcke Type 19 (Fig. 31, 13. 14) is present with 3002 fragments (including 688 rims and 1170 bases), 34 % of all fragments assigned to the ›Loeschcke series‹. As already mentioned above, this quantity is somewhat biased, because the attribution of 1118 flange fragments causes considerable overrepresentation, which is noteworthy in connection to the distribution map (Fig. 38). These flanged bowls are mostly attested in the main red and reddish-brown fabrics, with smaller quantities observed in the pale, sandy fabrics. A large number of wasters and overfired fragments (Fig. 24) emphasises the importance of the flanged bowl within Pitane's overall repertoire. Flanged bowls usually have a thick, very shiny red to reddish-brown slip, which sometimes is somewhat duller and rougher on the exterior, while the underside of bases was often left plain or only partially slipped; only few fragments have a thinner, shiny orange slip. Turning marks are often clearly visible on the exterior. Carinations were either precisely worked and sharp-edged, or more often were rather sloppily and irregularly made. There is considerable variation within the group of flanged bowls regarding typological details as well as size, as their diameter ranges from 8 to 24 cm. All Hayes' subtypes of Loeschcke Type 19, the »Prototipo«, »Prototipo antico« and »Prototipo tardo«, are well and roughly equally attested[275]. A more detailed, quantified evaluation of the subtypes of Loeschcke Type 19, also in comparison with Meyer-Schlichtmann's subtypes N 33 a–d, based on stratified material from cisterns on Pergamon's city hill[276], is nevertheless needed. Surprisingly, Loeschcke Type 18, a variant of the flanged bowl, was not attested and its classification can be questioned[277].

107 The carinated bowl Loeschcke Type 26[278] (= Meyer-Schlichtmann Type Sa 27[279]), with its low, heavy base, a carination from where the inclined wall starts, and a small, either rounded or vertical rim, is another of the main forms of the Pitane workshops (Fig. 31, 15). It derives most probably from Italian Sigillata Consp. 3[280], but

271 Hayes 1985, 76; Hayes 2008, 51 fig. 24, 778 (P 9171).

272 Many bases (n=109) are classified as Loeschcke Type 15/19, since distinguishing base fragments between these two types is not feasible. The scarcity of Loeschcke Type 15 as well as Loeschcke Type 15/19 rims and flanges suggests they belong to Loeschcke Type 19.

273 Loeschcke 1912, 370 f.

274 Ettlinger et al. 1990, 112 f. Compare: Hayes 1985, 76; Hayes 2008, 52.

275 Hayes 1985, 76 pl. XXVII, 5–7.

276 Meyer-Schlichtmann 1988, 107–109 cat. 163–173 pls. 13. 36. For its typo-chronological development, see Meyer-Schlichtmann 1988, pl. 31.

277 Loeschcke 1912, 370 f. pl. 28, 18.

278 Loeschcke 1912, 373–377 pl. 28, 26 a. b.

279 Meyer-Schlichtmann 1988, 128 f. cat. 235–240 pl. 16.

280 Ettlinger et al. 1990, 56 f. Meyer-Schlichtmann (Meyer-Schlichtmann 1988, 129) points to a local development of the carinated bowl Sa 27, with Late Hellenistic forerunners Sa 24 and Sa 25.

unlike the latter it also appears mainly undecorated (only in a few cases there are one or two circular grooves on the interior), and without potters' stamps[281]. In our collected material, Loeschcke Type 26 is represented by 4530 fragments (51 % of all fragments assigned to the ›Loeschcke series‹), which includes a considerable number of vessel wasters and overfired fragments (Fig. 24). The disproportion between rims (n=1720) and bases (n=2791) is caused by the easily recognisable, better-preserved bases of carinated bowls; this bias is noteworthy also regarding the distribution map (Fig. 38). The earlier version Loeschcke Type 26a, which is dated to the mid-1st to early 2nd century[282], is a more thin-walled version with a smaller, slightly higher, more rectangular base. In general, Loeschcke Type 26a was more smoothed and better finished, and more regularly having one or two concentric grooves on the interior. The later version Loeschcke Type 26b, which is dated to the first half of the 2nd century, has a slightly more outturned wall, a low and heavy base which is sometimes roughly finished, while the floor is often slightly concave. Carinations and the surface are less accentuated and less well-finished. Both subtypes are equally distributed in our survey material. A rare subtype of the carinated bowl, being closely connected to Loeschcke Type 26b, is Loeschcke Type 27 (Fig. 31, 16)[283]. It varies in the profile of the horizontal rim, which is offset by a groove and an outer ridge and compares well with Consp. 41[284]. Fifty-eight fragments are attributed to this type, which occur solely in red and reddish-brown local fabrics; just one vessel waster was attested. A type even less common (n=8) is the large hemispherical bowl Loeschcke Type 28[285], with a short, rounded, slightly upturned rim; it occurs in fabrics PIT 001 and PIT 002, but no wasters were identified.

108 Before discussing the successors of flanged and carinated bowls attributed to the ›Hayes series‹, it is necessary to mention a deep, heavy bowl, Loeschcke Type 29[286], which is regarded as the predecessor of ESC Hayes Form 1. This type is represented by 38 fragments in red and reddish-brown as well as in pale, sandy fabrics. One overfired fragment and one waster hint at local production, albeit on a limited scale.

109 (3) In total, 5005 fragments pertain to types of the ›Hayes series‹ (Fig. 32) – an impressive number which is enhanced if a further 3278 fragments is considered, which concern the category ESC/LRC, mainly the intermediate Çandarlı Hayes Form 4/ LRC Hayes Form 1. The ›Loeschcke‹ and ›Hayes series‹ represent the main phases of local pottery production at Pitane. Hayes' addition to the ›Loeschcke series‹ is based on his observation that the export of ESC did not end with Loeschcke's 2nd-century types (Loeschcke Types 19, 26 and 29), but mostly continued with types that represent developments especially of these three types[287]. Employing evidence of ESC imported elsewhere – especially the Athenian Agora, but also Corinth, Xanthos, findspots in Russia and Macedonia – Hayes attributed five further types to Pitane, Forms 1 to 5. The rich evidence collected by the Pitane Survey now allows to detail Hayes' attribution to Pitane not only by archaeometric study but also by direct autopsy of material from the workshops.

110 Hayes' large, deep bowl or basin Form 1[288] (Fig. 32, 1), with a heavy ring foot that evolves to a more or less rounded carination to a straight inclined wall which ends in a large, outturned angular rim, is a later version of Loeschcke Type 29, and

281 Compare: Hayes 1985, 77; Hayes 2008, 52. Loeschcke 1912, 375 fig. 6, shows the limited range of stamps on the interior of bowls Loeschcke Types 26–28.

282 Hayes 1985, 77.

283 Loeschcke 1912, 377 f. pl. 28, 27.

284 Ettlinger et al. 1990, 124 f.

285 Loeschcke 1912, 378 pl. 28, 28.

286 Loeschcke 1912, 378 f. pl. 28, 29.

287 Hayes 1972, 316 f.

288 Hayes 1972, 318–320 fig. 64.

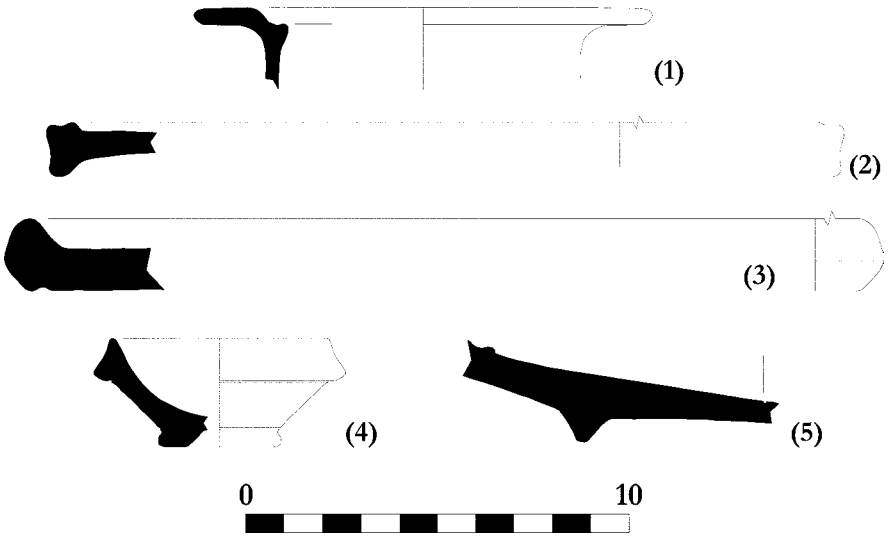
was dated by Hayes to the mid-2nd to 3rd century[289]. This type is represented by 2087 fragments (967 rims, 1101 bases, 19 body sherds), which parallels a significant number of vessel wasters and overfired specimens. ESC Hayes Form 1 mainly occurs in PIT 001 and PIT 002, and represents the combined continuation of the same raw clays and a morphological idea from the earlier production phases.

111 Carinated bowl ESC Hayes Form 2[290] sees Loeschcke Type 26b as its predecessor, with a low and heavy, sometimes roughly finished ring base, an often rather sloppy carination which marks the start of an inclined wall that ends in a rounded or triangular rim. This latter version of the carinated bowl sometimes had the slip partially applied, which can be a little duller though the slip quality can still be very good and shiny. This type is dated to the mid-2nd to 3rd century as well[291]. Hayes Form 2 is represented with 1787 fragments (910 rims, 875 bases and 2 body sherds). Vessel wasters and overfired specimens are well represented, and the type was documented predominantly in PIT 001 and PIT 002. The imprints of spacer discs point out that this stacking technique, which is already observed on larger bowls in the ›Loeschcke series‹, was also employed for the stacking of vessels of this form.

112 The hemispherical, flanged bowl ESC Hayes Form 3[292] (Fig. 32, 2. 3), both possibly a »Prototipo«) is a latter development of Loeschcke Type 19 yet having a shorter, thicker flanged rim and a more squatted profile overall; small versions of this type are not at all uncommon. This type is less well finished, with sometimes a duller slip, but as on Hayes Form 2 the slip can be very good, thick and shiny. This type is also dated to the mid-2nd to 3rd century[293]. This type is represented by 301 fragments (123 rims, 71 bases, 107 body sherds (i.e. flanges), and a notable quantity of vessel wasters (see Fig. 23 c) and overfired specimens was identified. ESC Hayes Form 3 occurs almost exclusively in PIT 001 and PIT 002, sometimes in PIT 006 and PIT 009; two fragments were identified in PIT 003 (one being uncertain).

113 Only plate ESC Hayes Form 4[294] (Fig. 32, 4) is no obvious direct successor of any Loeschcke type, though a link with the earlier plates Loeschcke Type 6 has been suggested. The plate has a wide, tapering foot, a slightly upturned floor which ends in an inturned rim; the exterior transition between floor and rim is sometimes marked by an angular carination. Occasionally, one or two concentric grooves can be observed on the interior floor. Surfaces can be poorly finished: the slip is sometimes rather dull, sometimes thick and shiny, as observed for other ESC Hayes forms. Hayes placed this type's appearance in the late 2nd century and is most prevalent in the 3rd century. Hayes has suggested that this type forms the missing link with LRC Hayes Form 1; the shape thus continued into the 4th century[295]. Eight-hundred-and-thirty fragments are attributed to this type (474 rims, 343 bases and 13 body sherds), while a further and impressive 3074 fragments could only be classified as ESC Hayes Form 4/LRC Hayes Form 1, displaying a wide variety in profile and finish. This latter number illustrates the shape's popularity, and certainly crucial food for thought concerning the continuation of tableware manufacture in Aiolis during the 4th century, specifically at Pitane. Equally noteworthy is the large number of vessel wasters (see Fig. 22 d) and overfired fragments. While fragments attributed to ESC Hayes Form 4 mostly occur in PIT 001 and PIT 002, interestingly, those classified as ESC Hayes

289 Hayes 1985, 77.
290 Hayes 1972, 319–321 fig. 64.
291 Hayes 1985, 77 f.
292 Hayes 1972, 320 f. fig. 64.
293 Hayes 1985, 78.
294 Hayes 1972, 320. 322 fig. 64.
295 Hayes 1972, 322. 326; Hayes 1985, 78.



33

Fig. 33: Selection of ESC fragments that do not readily correspond to existing typologies. (1) Inv. UM19 Fst. 01.12E K 2; (2) Inv. UM19 Fst. 02.19D K 1 (related to Loeschcke Type 4?); (3) Inv. UM20 Fst. 05.24B K 2; (4) Inv. UM19 Fst. 01.19D K 3; (5) Inv. UM20 Fst. 05.19 K 2 (related to Loeschcke Type 2?)

Form 4/LRC Hayes Form 1 do occur in a macroscopic fabric that resembles PIT 001 and PIT 054 (cf. infra for the latter).

114 Hayes' fifth type is his Form 5[296], a deeper and smaller version of ESC Hayes Form 4, which is represented by just 1 fragment (in PIT 002), which as such provides no convincing evidence that it was manufactured at Pitane. It is perhaps illustrative that Hayes no longer included it in his later typology.

115 (4) A small quantity of ESC fragments, including some that can be classified as ›early ESC‹, is present in the collected material that, although mostly diagnostic, could not be readily ascribed to known typologies (Fig. 33). Some of these can be seen as variants of established types, and their general character merit their presentation here.

116 In summary, in addition to types which Loeschcke had already showed were (mostly) locally manufactured, most of the Late Hellenistic/Early Roman Imperial as well as Augustan types which Hayes associated with Pitane could be corroborated by the collected evidence, mostly based on macroscopic fabrics. This concerns Types A1, A2, A4, A5, A8, A9, and A10 which occur in small quantities. Furthermore, and with some reservation, the local production of Augustan arretina-style types of plates and bowls with vertical rim (A3, A6, and A7) can also be drawn somewhat more into the spotlight, not only because of macroscopic fabric classification but also the identification of vessel wasters and overfired fragments for some of these types, albeit in small to very small quantities. These early ESC types often have a dense, shiny, orange to reddish orange slip, which Loeschcke described for his stratigraphically older series. Even if especially PIT 001, and to a lesser extent also PIT 002 and PIT 006, predominate, occasionally also PIT 003 and PIT 005 are represented amongst the »serie augustea« (cf. supra).

117 That much of the collected repertoire comprises Loeschcke Types 15 and 19 and Hayes Form 3, Loeschcke Type 26 and Hayes Form 2 as well as Hayes Form 1, tentatively hints that the peak of production falls in the mid-1st to 3rd century – at least as far as the survey zone is concerned. It is interesting that in particular these types, in addition to occurring mostly in PIT 001, PIT 002, PIT 009, and PIT 006 and usually having a thick, very shiny red slip (sometimes being rather dull on the exterior), in small quantities also occur in PIT 003, PIT 005, and PIT 010, with a shiny, red to dark red, often poorly adhering slip. Furthermore, the considerable number of plates Hayes Form 4 as well as a large quantity of fragments documented as ESC/LRC Hayes Form 4/1, not

296 Hayes 1972, 320. 322 fig. 64.

only underline this shape's popularity, but almost certainly also highlight the continuation (the question whether or not there was a hiatus cannot be explored using survey evidence) of its production, into LRC.

LRC

118 Two fabric groups were identified as local LRC: PIT 054 (Fig. 28, third row, left and centre), which during sample selection was subdivided into subgroups a and b, and PIT 061. Both could be macroscopically and archaeometrically distinguished from PIT 051 (Fig. 28, bottom row), which is regarded as LRC from Phokaia.

119 Hayes already observed that some LRC fragments did not conform to his standard ware/fabric: »a small series of thicker-walled and coarser pieces, typified by Type H, may indicate the existence of a second production centre. These vessels have the thicker ware and thicker, more glossy slip already noted in the case of some examples of Form 1; they seem closely related to the earlier Çandarlı ware, and in some instances actually exhibit the same sparse flakes of golden mica (a feature not otherwise found in Late Roman C). Nos. 1, 7 and 17 in the Catalogue above, together with the examples of Type H, may belong to this category«[297].

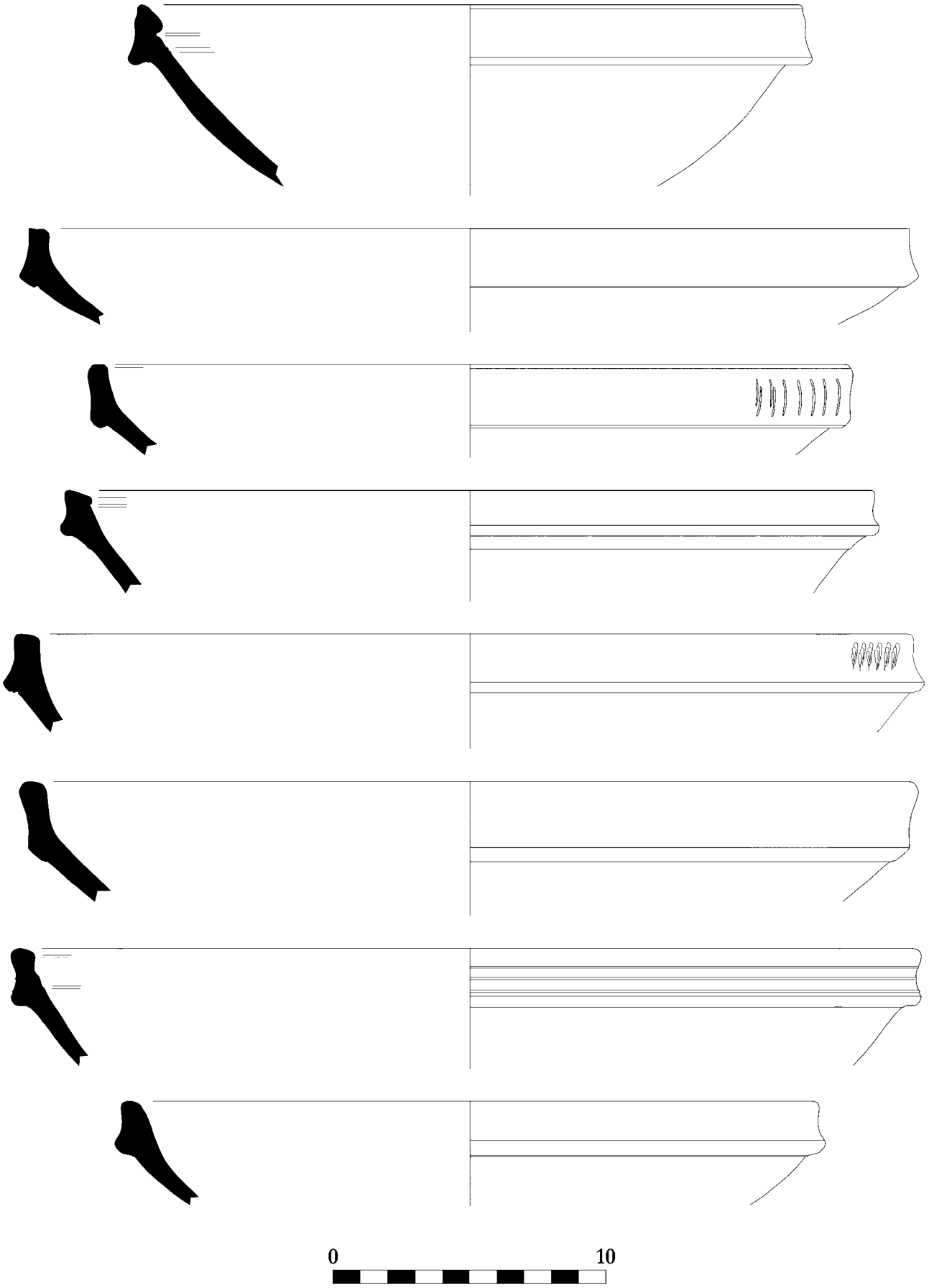
120 Having previously discussed the artefactual evidence which attests local LRC manufacture, here presented are its attributes regarding macroscopic fabric and surface, morphology, and decoration. As mentioned earlier, caution was exhibited in too rigidly employing Hayes' typological and chronological framework for LRC/Phocaean Red Slip Ware (cf. supra, Aims and Methodology). That framework was nevertheless used as a general guide where feasible. In other words, a significant number of rim fragments could be paralleled to and thus classified as Hayes Form 1 or 3; any subsequent classification of the latter, as with ›real‹ LRC, was often difficult, resulting in terms such as »Hayes 3-ish«. Admittedly, this is not ideal but serves its purposes for the moment. Ultimately, the manufacture of LRC at Pitane needs to be assessed on its own, internal (i.e. site-specific) circumstances: different clays, different people/potters, different socio-cultural climate, possibly also different chronologies, etc.

121 A total of 424 fragments was assigned to PIT 054, the macroscopic fabric which represents the local LRC. Its typological repertoire displays several interesting features. Some 136 fragments could be classified as Hayes Form 1, including a number of this form's type-variants A–D. Only 7 fragments were identified as Hayes Form 2 (six of which resembling type-variant A), which is a comparatively rare form more generally. Then, 211 fragments were categorised as Hayes Form 3, which potentially reflects this form's general popularity. While a number were attributed to type-variants B–H in Hayes' classification, local LRC fragments resembling Hayes Form 3 seem to better match Hayes Form 3's later variants E–H (Fig. 34). To what extent this observation also is a chronological marker remains to be seen, and is discussed further below. Nine fragments were interpreted as Hayes Forms 4–6 (5 Form 4; 1 Form 5A; 3 Form 5–6), which again could match these forms' relative scarcity more generally. Only a single fragment was tentatively classified as Hayes Form 10B. This, and the complete absence of wasters resembling Hayes Form 10, led us to conclude that this form was not manufactured at Pitane. This is arguably one of the more interesting observations, one also with potential chronological implications.

122 It appears as if vessels were fully slipped – double-dipping streaks were not observed. The upper interior wall of local LRC vessels often is finely corrugated, whereas the remainder of the interior has a smoother slipped surface. Whilst this might recall what Hayes had observed concerning LRC[298], and which hints at slightly different

297 Hayes 1972, 336.

298 Hayes 1972, 324.



34

Fig. 34: Selected locally-manufactured LRC, all variants similis to Hayes Form 3. From top to bottom: Inv. UM20 Fst. 06.09A K 1; Inv. UM20 Fst. 03.25A K 2; Inv. UM20 Fst. 05.07 K 3; Inv. UM20 Fst. 03.27C K 4; Inv. UM20 Fst. 05.08C K 1; Inv. UM20 Fst. 03.08C K 1; Inv. UM20 Fst. 05.16 K 2; Inv. UM20 Fst. 05.08C K 2

finishing techniques pertaining to different parts of vessel surfaces, it is not unthinkable that this ›band‹ came about when the rim of a vessel was turned and/or finished.

123 One particular aspect of the manufacture and morphology of LRC elsewhere is a small exterior ridge (»the curious small offset«) where the wall meets the rim. This attribute is also observed on LRC fragments attributed to the local (Pitane) production (Fig. 22 j), which suggests that it was a technological aspect shared by (at least) two production centres of LRC. Hayes interpreted this to indicate the use of moulds in the production of LRC, in particular regarding later variants of his Form 3 as well as his Form 10[299]. Leif Vaag, however, rejected the idea that moulds were used, and explains various attributes as a result of »dry-scraping«[300]. This is interesting, as one of these attributes, »numerous small scratches«[301], is also characteristic for the manufacture of ESC, in particular of Hayes' repertoire of the 2nd and 3rd centuries. This could suggest that dry-scraping was also practised for these vessels, which could well explain the sometimes very sharp and angular carinated walls, for example on Hayes Form 1. For ESC, as a matter of fact, Hayes did observe that these »numerous scratches« result »from the final tooling«[302], and thus not from the use of moulds.

124 For those studying LRC found at consumption sites and hence are familiar with the repertory of stamped motifs[303] and patterns of rouletting – which were sometimes combined to produce intricate patterns to great aesthetic effect, particularly on earlier forms – decorative elements on LRC which was manufactured at Pitane provide a stark contrast. Only a single, partially preserved stamp was tentatively identified as local LRC (Fig. 35), showing either two partially preserved palm branches of triangular shape with horizontal hatching pointing inwards, or two partially preserved arms of a cross, neither of which occur in Hayes' repertoire of stamped motifs. It appears as if rouletting was not applied on the interior floor of local LRC, though it does occur on the outer rim of vessels resembling Hayes Form 3. It is a much simplified version of the more commonly observed patterns on LRC which can consist of multiple rows of rouletting, sometimes of varying height which, according to Hayes, indicates that these were »mostly applied with a multiple implement with two, three or four sets of teeth capable of producing a whole band of decoration at once. Sets of parallel overlapping strokes are visible in some cases where the full circle has been completed. This labour-saving device appears not to have been used outside Asia Minor«[304]. On LRC ascribed to the local manufacture at Pitane, rouletting – when it occurs – mostly consists of a single row of vertical, somewhat diagonal or slightly curved strokes placed within the concave part of an exterior rim (Fig. 36).

125 Especially during the Pitane Survey's study season in 2021 it became clear that what is now considered to be local LRC can both macroscopically as well as chemically be distinguished from LRC which was manufactured at Phokaia. This notion was particularly strengthened by the selection of samples for portable XRF (pXRF) measurements from the survey's macroscopic fabric reference collection, and a preliminary analysis of these measurements. Fragments that were macroscopically attributed to PIT 051 (LRC made in Phokaia) and PIT 054 (LRC made in Pitane) and which were subsequently measured by means of pXRF, also showed up as two distinct groups in a preliminary exploration of this data (Fig. 27). That said, there are three distinguishing criteria:

299 Hayes 1972, 324; Hayes 2008, 84.
300 Vaag 2003, 204.
301 Vaag 2003, 204; Hayes 1972, 324.
302 Hayes 1972, 317.
303 Hayes 1972, 346–370; Hayes 2008, 84; also Vaag 2001.
304 Hayes 1972, 324.

35

36

Fig. 35: A partial preserved stamp on locally manufactured LRC. Inv. UM20 Fst. 03.04C K 1

Fig. 36: Rouletting on locally manufactured LRC Hayes Form 3. (a) Inv. UM19 Fst. 01.11C K 3; (b) Inv. UM20 Fst. 05.08C K 1; (c) Inv. UM20 Fst. 05.07 K 3; (d) Inv. UM20 Fst. 03.27C K 2

1. The fabric of LRC from Pitane, when studied with the naked eye, a hand lens or through a digital microscope, shows a light-coloured matrix which contains common to abundant tiny to small pale and darker greyish inclusions, some whitish bits, some orange-lighter brown grits, and some pores. Flakes of gold-coloured mica can be present, and the slip can contain silver-coloured dust mica;
2. In comparison to LRC from Phokaia, local LRC vessels are thicker-walled and as a whole less well-finished, in particular rim segments;
3. The near absence of stamped decoration, while any rouletting is of a much simpler kind.

126 Seen through modern eyes, LRC from Phokaia can aesthetically be regarded as a better product. Whereas this can be interpreted as an unfair – and untrue – simplification and interpretation of the past, in our opinion however the above should assist to start distinguishing between LRC from Phokaia and from Pitane (as well as other centres), in order to gradually obtain a better notion of the geographical and proportional role of the different production centres of LRC.

Diachronic Interpretation of the Survey Zone

127 The archaeological zone that was surveyed in 2019–2020 presents a number of interesting features which are here discussed in a combined spatial and diachronic manner.

A Diachronic Perspective

128 Contrary to various suggestions that were made in the past, besides a few Late Hellenistic/Early Roman Imperial ESC types that were classified by fabric, no evidence was found for the manufacture of pottery prior to the Roman Imperial period, nor for the manufacture of ceramic categories other than TS/RSW. The start of that production, however, lies beyond secure reach. The distribution of 1st-century types (Hayes Forms A1–11, Loeschcke Types 1, 6, 9, and 15) does present an interesting pattern (Fig. 37), which only to some degree corresponds to the density map (Fig. 5). There is a small focus in Fst. 07, and a particularly strong one in parts of Fst. 01–03,

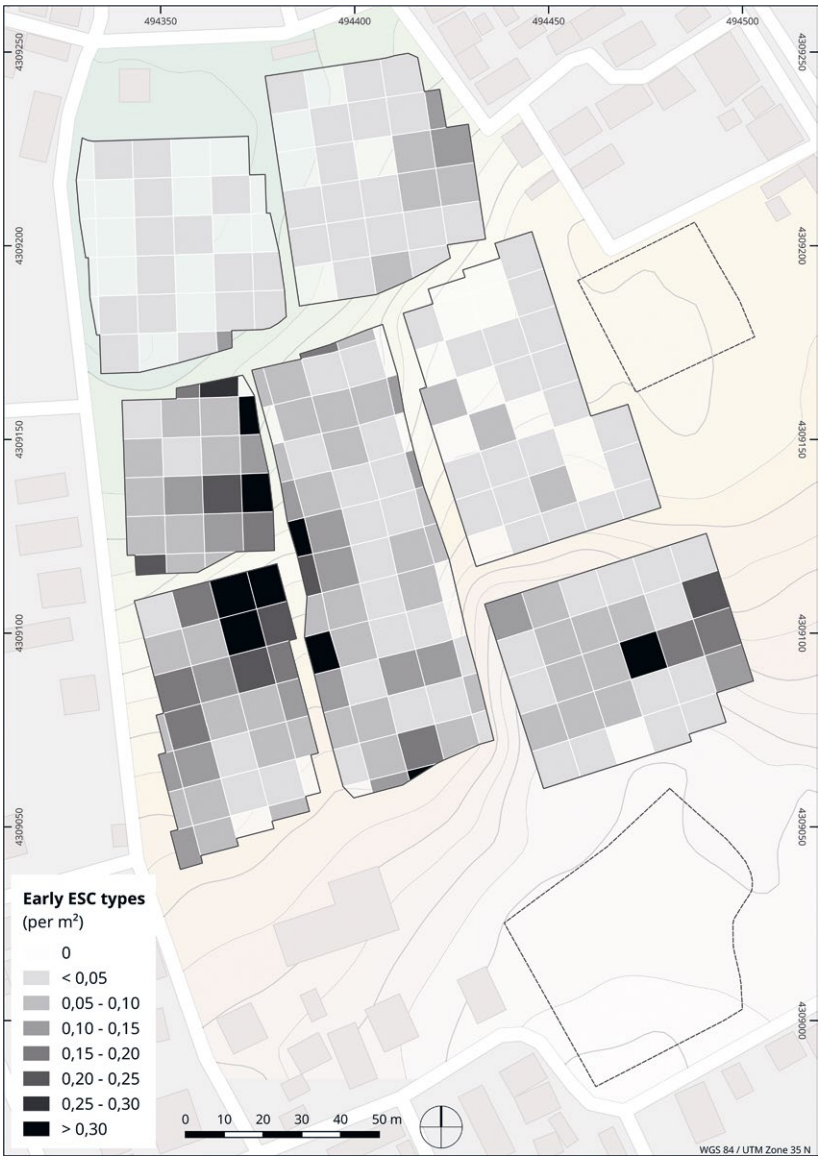


Fig. 37: Map showing the visibility-corrected counts of 1st-century ESC Forms per m²

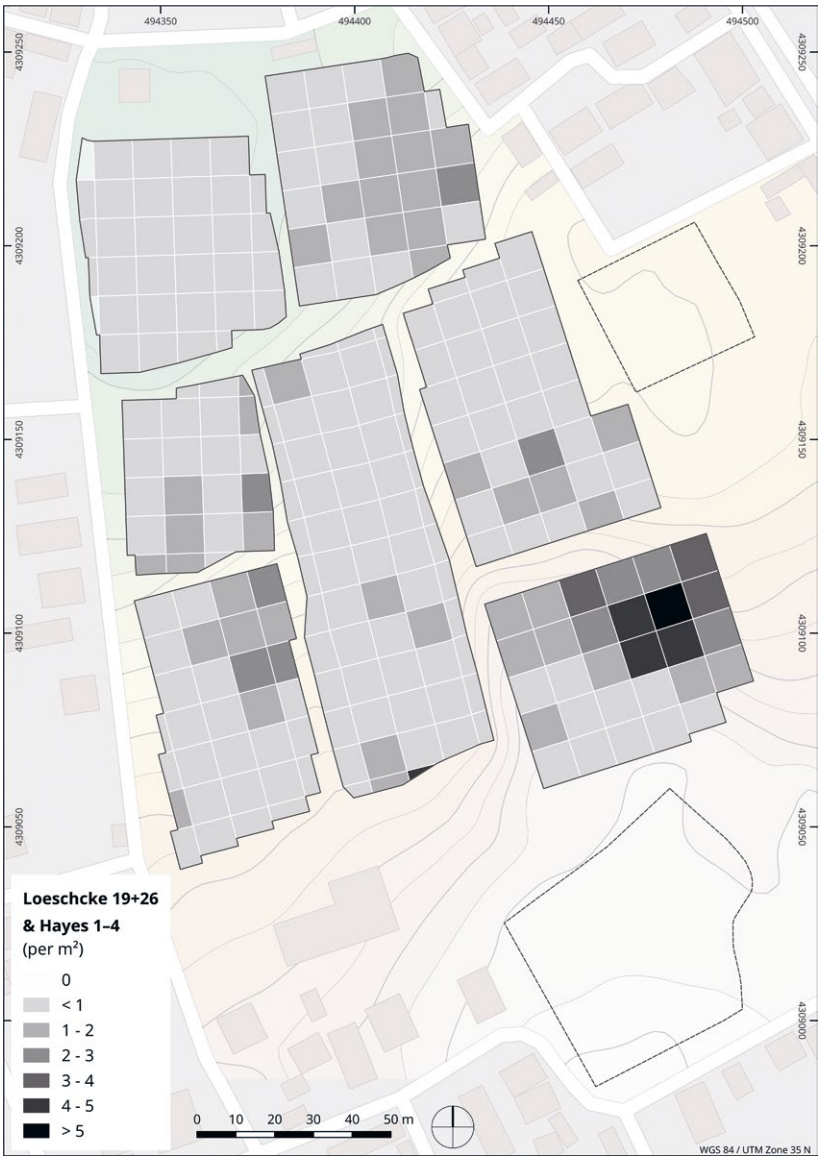
37

which plausibly hints at an early activity/occupation area. However, wasters that could be unequivocally attributed to this early ESC repertoire are few and far between (see Fig. 24). This allows to postulate, albeit tentatively, that production began sometime in the 1st century, possibly already in its first half[305]. This finds some support in the results of the pXRF analyses which included a Hayes Form A5, which falls into the same larger compositional group (based on zirconium and manganese) considered to represent the local fabric(s). It is worth noting that no early wasters were found in Fst. 04–05, though wasters, kiln slag as well as kiln lining are comparatively rare in these two Fst. anyway (see Fig. 7). One should of course take into account that the archaeological residue of subsequent pottery-making and other activities is blurring a balanced understanding of this early phase.

129 As a pottery production centre, Pitane really came into its own during the later 1st and subsequent two centuries[306]. With its output of a morphologically limited

305 See Hayes 2008, 199 cat. 781, for a probably early Çandarlı product found in Athens.

306 Hayes 2008, 52 f. Note, however, that Hayes 1972, 316; Hayes 2008, 51 f. places the main phase between the mid-2nd and late 3rd, early 4th century.



38

Fig. 38: Map showing the visibility-corrected counts of ESC Loeschcke Types 19 and 26 as well as Hayes Forms 1–4 per m²

yet distinct repertoire[307], it succeeded in supplying communities particularly around the Aegean with red slip tableware, assuming that (the bulk of) this export was indeed manufactured at Pitane and not at Elaia, Pergamon or perhaps at one or more other, as yet unidentified places of manufacture. Setting up the workshops at a coastal location – the sea was/is almost literally a stone's throw away – must have been a conscious decision, plausibly in response to economic and other developments in the Pergamon micro-region and beyond[308]. This phase of local pottery manufacture can arguably best be visualised by [1] several ›signature‹ forms, specifically Loeschcke Types 19 and 26 and Hayes Forms 1–4 (Fig. 38); and [2] the distribution of all ESC wasters (Fig. 39). Both groups are spread across much of the survey zone.

130 Whether the manufacture of ESC and LRC at Pitane was continuous or not is a question that cannot be answered; if, however, there was a slowdown if not actual

307 Hayes 1972, 316–322; Hayes 2008, 52 f.

308 Originally already suggested by Loeschcke (Loeschcke 1912, 352). A study of the amphora fragments, which reflect Pitane's role as a harbour-town that helped organise the arrival and (re)distribution of other goods, is being carried out by the first author, in tandem with a study into the geographical distribution of ESC.

Fig. 39: The visibility-corrected quantitative distribution of all ESC wasters

39

halt in production this presumably did not encompass more than 50–100 years. Indeed, one of the pressing questions concerning ESC and LRC is that of typological and chronological continuity[309]. Key here are plates of ESC Hayes Form 4 and LRC Hayes Form 1, about which in particular Hayes has pointed out that these are essentially the same shape, and could typologically and chronologically bridge the regional production of both types and, more generally, both categories[310]. This includes the manufacture of ESC- and LRC-style vessels at Gryneion, which remains barely studied[311]. While a number of the collected finds could be attributed to either type – based on profile, slip (quality) and macroscopic fabric properties – many however could not, yet for being classified as ESC/LRC Form 4/1, these could reflect a transitional phase of production. However, as already mentioned, the nature in which this material (i.e. survey) was collected does not allow, unfortunately, to reliably explore this important question.

309 A similar discussion pertains to Eastern Sigillata D and Late Roman D; see Meyza 2007; Poblome – Fırat 2011; Özden Gerçeker 2020.

310 Hayes 1972, 369.

311 Hayes 2008, 83 f.

40

Fig. 40: The visibility-corrected quantitative distribution of all LRC wasters

That said, such continuity is plausible within a regional context, wherein ideas, objects and people would travel, particularly when one considers a regional model of production: two or more production sites that to a significant extent produced similarly styled vessels. However, whereas continuity of production is hypothesised for Pitane, this does not seem to apply to Phokaia. In other words, there is no evidence that suggests Phokaia produced red slip tablewares during the Roman Imperial period (i.e. prior to LRC), which implies that it only emerged as a significant new production centre for tablewares during the mid-4th century, even if it could boast on a centuries-long tradition of making quality cooking vessels which were distributed far and wide[312]. Rather than seeing the start of LRC production at Phokaia as a unique event that went hand in hand with the introduction of an essentially new repertoire, the possible inspiration drawn from ESC Hayes Form 4, as well as the archaeological evidence for LRC production at Pitane presented here more generally, offers food for thought to start rethinking this scenario, be it perhaps in part[313].

312 Fırat 2011.

313 Cf. Hayes 2008, 87: »An unusually early occurrence of the classic fabric (in its early, rather soft-fired version)

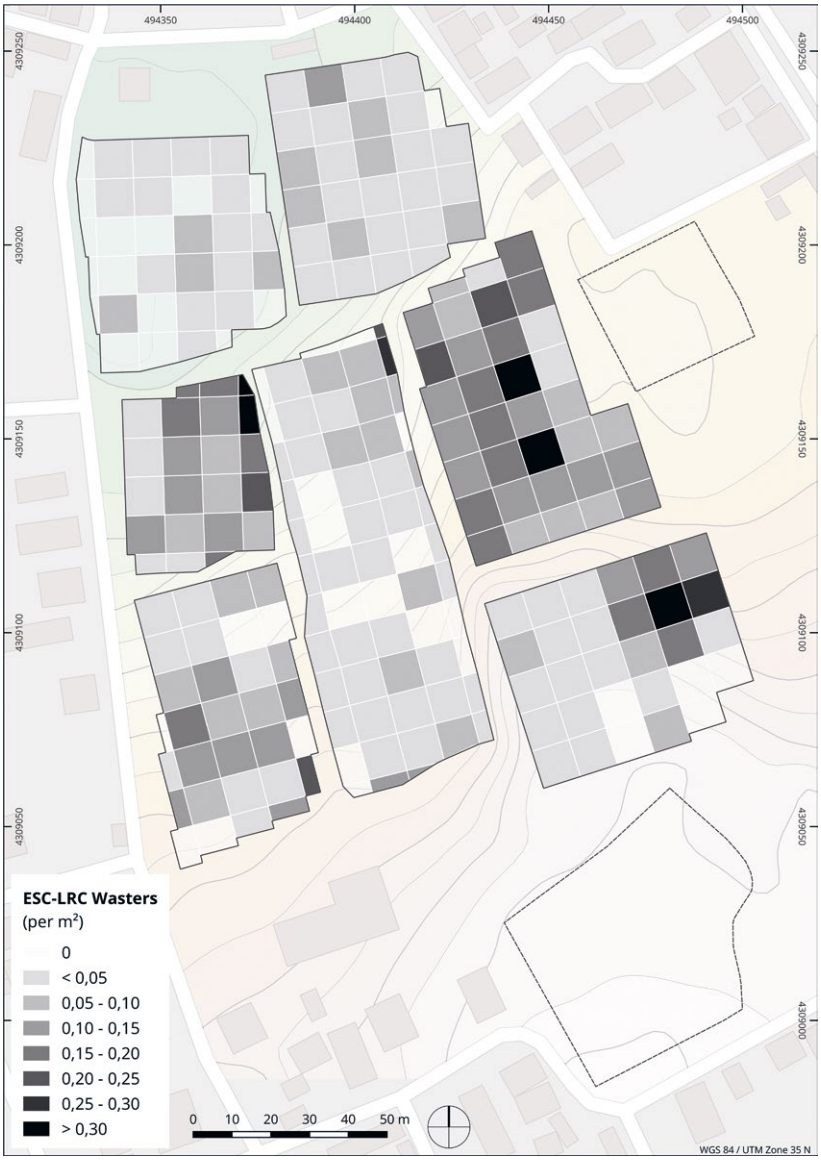


Fig. 41: The visibility-corrected quantitative distribution of all ESC/LRC wasters

41

131 The waster evidence for LRC manufacture shows a more limited quantitative and spatial distribution, with a somewhat stronger signal in the southern half of Fst. 03 (Fig. 40). This does not, however, imply a slump in local LRC production, as we need not be observing the main residue zone of that production. The majority of the wasters however were too deformed, fragmented or showing no typologically diagnostic features, thus defying an attribution to either ESC or LRC. Their classification as ESC/LRC wasters is visualised in Fig. 41, showing a spread across much of the survey zone, with several foci, particularly in Fst. 06. When this latter map is compared to those of ESC and LRC wasters, it is more likely that the majority of the ESC/LRC wasters actually represent the ESC phase of manufacture. This is perhaps most convincingly observed in Fst. 07, which is nearly devoid of pottery fragments that post-date the mid-fourth century (cf. infra),

is seen here in 1230. If its context has been correctly interpreted, this should antedate all other Agora finds of the ware by a good half-century, and indicate that limited production of dishes modelled on Çandarlı types had started by 300. Other early examples of related shape are 1229, 1231, probably from other regional workshops. These, with their glossy slip and tapered feet, have a good deal in common with some late Çandarlı products (cf. 807); they belong to a small class of vessels of transitional character«.

42

Fig. 42: The visibility-corrected quantitative distribution of Phokaia LRC Forms 1–2

and thus appears to have been beyond the action radius of activity/occupation patterns during that time.

132 This is not to say that the Late Roman period at Pitane had lost much of its significance, which is for instance clearly illustrated by the distribution of imported LRC of Hayes Forms 1–2, 3 and 10 respectively, presumably from Phokaia (Fig. 42. 43. 44). Especially the latter two type-groups show a stronger signal in the southwestern survey zone, which possibly represent occupational and/or waste-disposal patterns – note that LRC wasters also are slightly more common here (Fig. 40). Hopefully, the future study of the amphorae will shed further light on variations in quantitative-spatial patterns. A quantitative representation of imported LRC (cf. infra, Fig. 45) is a potential clue regarding the end of LRC manufacture at Pitane. Whilst Hayes' LRC typology and chronology should not be applied uncritically to classify LRC made in Pitane (cf. supra), Fig. 45 shows that imported LRC became more common from the first half of the 6th century onwards. Recalling that no evidence for the production of LRC Hayes Form 10 was found at Pitane, this allows to think of a scenario wherein local LRC manufacture ended sometime in the first half to mid-6th century. From then on, people who lived and/or worked in Pitane began to rely more dominantly on the import of LRC.

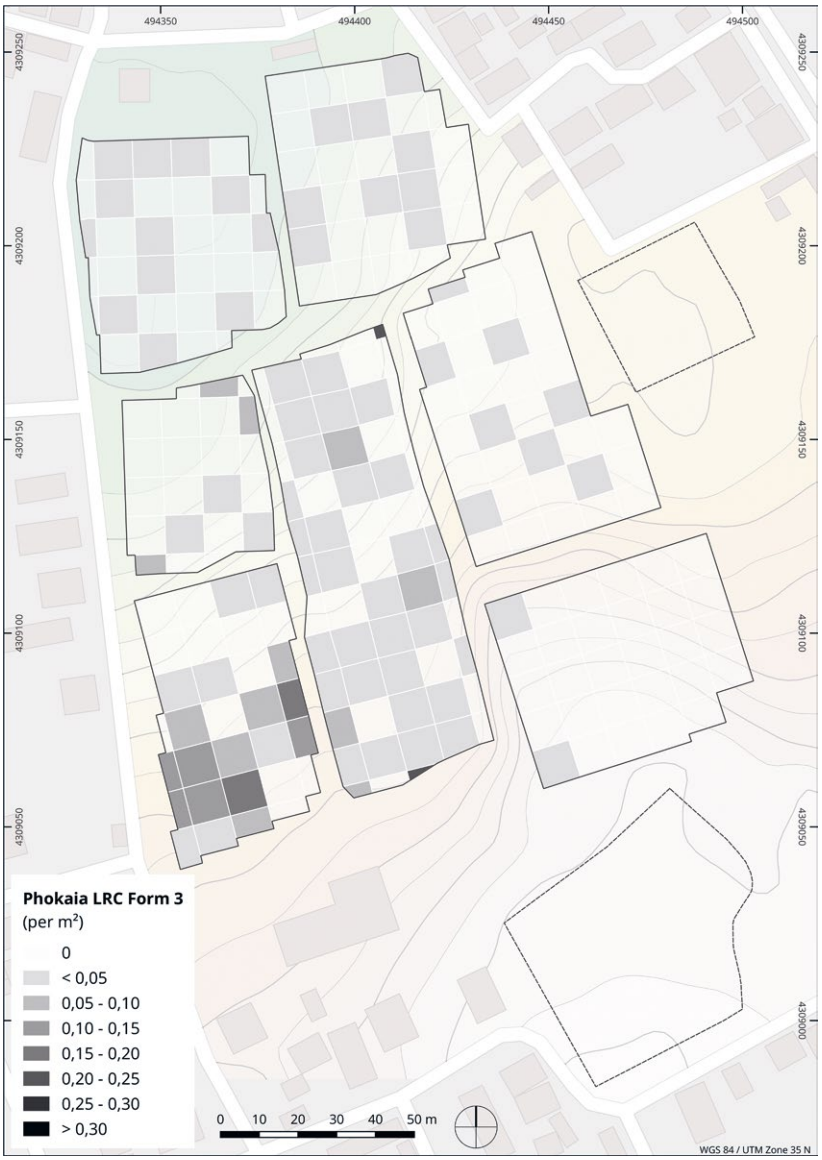


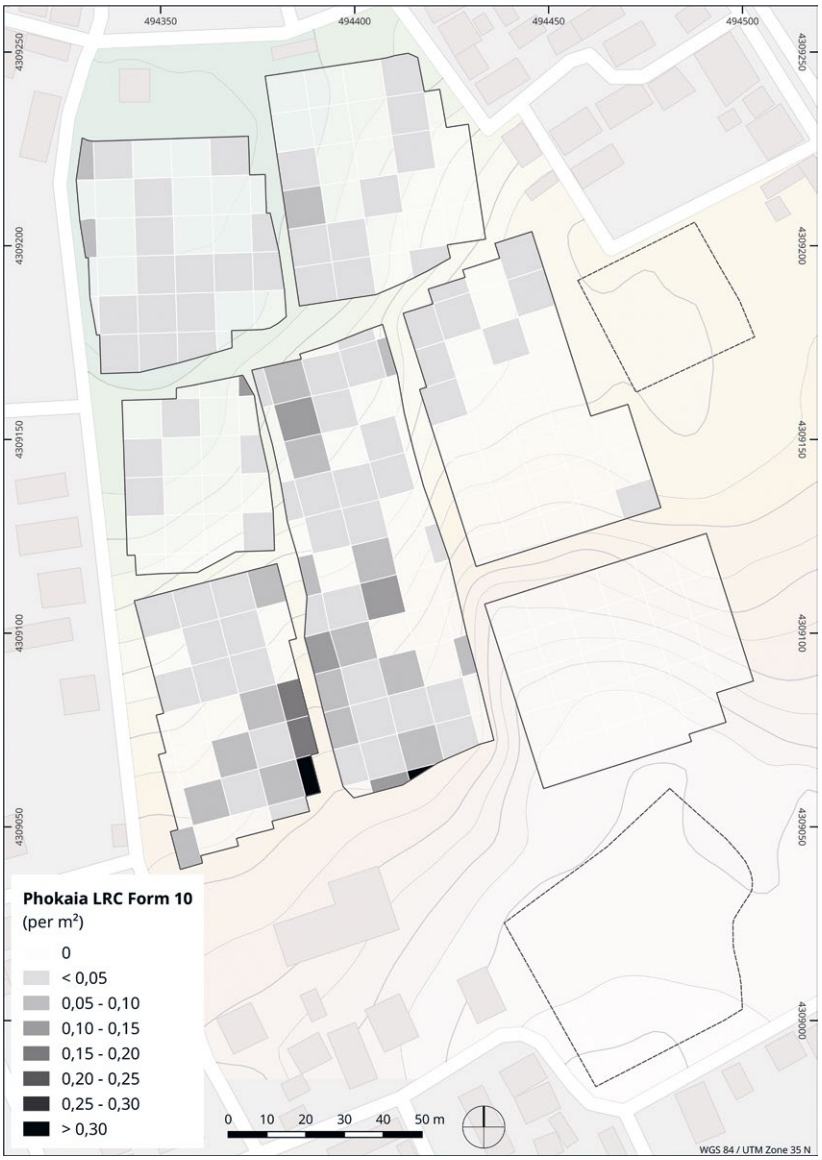
Fig. 43: The visibility-corrected quantitative distribution of Phokaia LRC Form 3

43

Manufacturing Techniques

133 The manufacturing and firing techniques of ESC and LRC show certain particularities that not each and every production centre of TS or RSW practised, as far as such information is available. Indeed, the main issue here is that we know very little about production techniques – or the chaîne opératoire more generally – from elsewhere in the Roman East. Whereas vessel stacking and lining (parts of) a kiln's interior were more widespread phenomena, the use of spacer discs for example appears to have been more limited, a feature that was specific (but not unique) to the Pergamon region, as finds also from Elaia testify (cf. supra). Their use, however, was restricted to large, deeper bowls which consequently also required the use of stacking devices.

134 That said, there are other clues that indicate that the 4th century was a time of significant changes. First and foremost, this of course concerns the ›disappearance‹ of ESC and ›appearance‹ of LRC, yet there are two further aspects that point to more profound changes in the regional artisanal climate and chaîne opératoire during that time. First, the finds from the Pitane Survey make it clear that spacer discs were no longer used for firing LRC. From then on, all vessels were placed one on top of or inside the other, which in turn indicates that the technique of vessel stacking was not abandoned. Second, finds that were considered to represent the local LRC production



44

Fig. 44: The visibility-corrected quantitative distribution of Phokaia LRC Form 10

(fabric PIT 054) were classified because of quantitative presence, but also because of certain macroscopic characteristics that match with the locally made ESC (predominantly fabrics PIT 001 and PIT 002). Measurements with a pXRF (cf. supra) fully confirmed this macroscopic classification and distinction. Macroscopically (i.e. with the naked eye), Pitane LRC is richer in inclusions, or at least, the inclusions are visibly larger, especially when a fresh break was studied using a hand lens and USB microscope[314]. The size range of these various inclusions, however, makes it unlikely that we are dealing with tempered fabrics. This potentially suggests that the potters continued to quarry the same raw clay material for the local manufacture of LRC, but that this raw material was less well prepared (e.g. levigated).

135 Thus, at Pitane, clay preparation, vessel repertoire, and certain technological aspects changed in the course of the 4th century. Whether these changes happened simultaneously is uncertain, but if so, this would strengthen the notion of a more profound technological and/or economic shift. Also, each change – whether in combination or individually – could have influenced the speed with which vessels were produced.

314 The largest inclusions are ca. ≤0.5 mm.

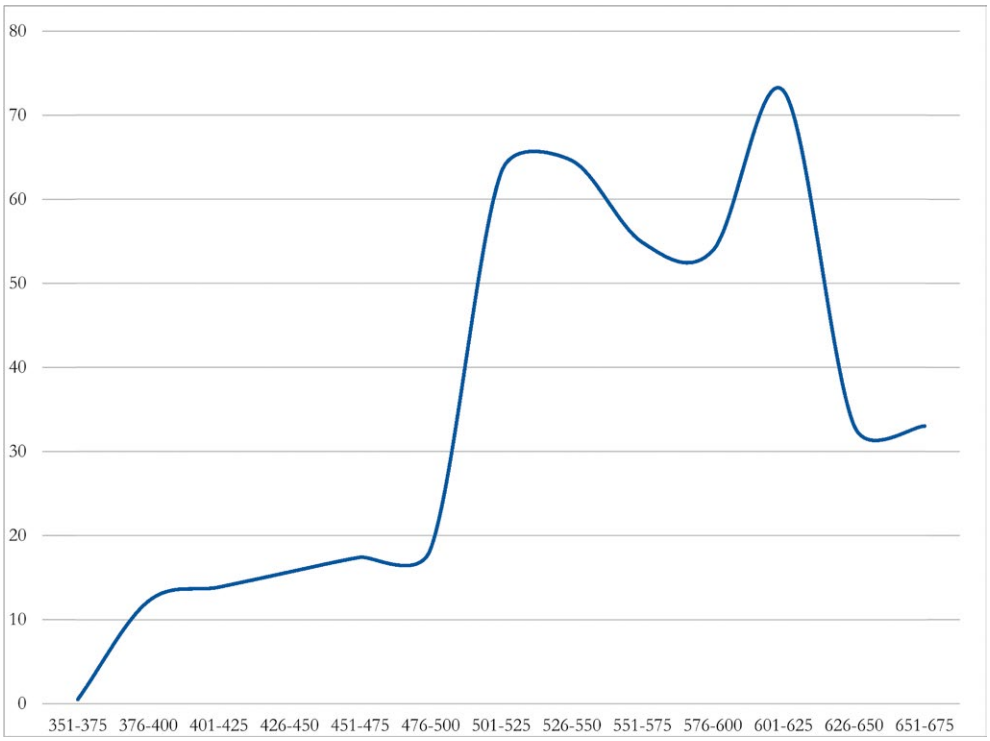


Fig. 45: Quantitative, linear representation of LRC imported from Phokaia found at Pitane

45

One aspect that does not appear to have changed in any fundamental way is decoration. The survey finds clearly echo Hayes' observation that on ESC »decoration is kept to a minimum«[315]: no lettered (potter's) stamps were found – though by the time that the production of ESC took off this custom had begun to wane, certainly in the Eastern Mediterranean[316] – and no more than a handful of anepigraphic stamps (a few rosettes, for example) was collected[317]. Loeschcke, however, did identify several lettered and motif stamps which he associated with his Type 26[318]. Also, Pitane LRC was sparsely decorated: relatively common is simple rouletting on the outer rim face of bowls of Hayes Form 3 similis, which mostly consists of a single row of slightly curved strokes. This is in strong contrast to the often more detailed and relatively complex patterns on Phokaia LRC. Another common characteristic of Phokaia LRC are stamps on vessels' interior floors[319], a custom that lasted well into the 6th century. These stamps vary from a single, central stamp to more complex patterns that could involve multiple stamp motifs as well as multiple, circular bands of rouletting. Fragments of Pitane LRC with stamped decoration were not identified.

136 Another significant result of the Pitane Survey is that LRC which was made at Pitane and at Phokaia can be distinguished, not only chemically (yet anticipating the results of the XRF analyses) but also, and in some respects more importantly, also macroscopically, i.e. with the naked eye and/or the use of a hand lens or digital microscope. This will make it possible for others to start identifying and separating LRC fragments by fabric during fieldwork, which consequently requires a different approach to the classification of LRC fragments. It is proposed here that, when positively identified, fragments can be classified accordingly as Phokaia LRC and Pitane LRC. When the (macroscopic) attributes

315 Hayes 1972, 317.
316 Bes 2017.
317 Hayes 2008, 52.
318 Loeschcke 1912, 374–377 fig. 6.
319 Hayes 1972, 346–348; Vaag 2001.

of LRC manufactured at Gryneion and Pergamon are published and are distinct enough from Pitane and Phokaia, these can be named in a similar vein (i.e. Gryneion LRC and Pergamon LRC). Ephesus, and possibly other centres as well, remains more problematic because of the name Ephesian Red Slip Ware under which LRC-style vessels have been grouped. This indeed would imply a more formal return to the use of LRC, a term introduced nearly a century ago and which for a time was considered obsolete[320].

137 As important is the observation that PIT 003, PIT 005 and other pale, sandy fabrics appear to represent local production in Pitane, and need not be attributed to a branch workshop in the Pergamon micro-region, as Hayes had suggested[321]. In addition, for the first time, a series of Early Roman Imperial types, such as plates with vertical rims, as well as the entire repertoire of Augustan types which Hayes defined and used to expand Loeschcke's typology, seem to represent local production too. Furthermore, the absence of overfired fragments and/or in particular vessel wasters of certain types, which Loeschcke himself regarded to belong to the local repertoire, led to the tentative conclusion that these were not manufactured at Pitane.

A Spatial-Functional Perspective

138 One last topic that merits attention concerns the area that was surveyed. The archaeological evidence that was collected confirms and builds upon Loeschcke's research and observations dating back to the early 20th century. The question is what this material represents in spatial-functional terms; in other words, how was this zone used in Antiquity, and what has been surveyed exactly? A significant element in that discussion are the results of geophysical prospection (Ground Penetrating Radar (GPR); gradiometer/magnetic survey; cf. supra)[322]. The gradiometer/magnetic survey covered all 9 Fst. as shown in Figs. 3. 4, while the GPR subsequently focused on two smaller areas within that zone. Besides a number of potential archaeological-structural remains (e.g. walls), of more direct albeit tentative significance is a circular anomaly with a diameter of some 4 metres, located near the northeast corner of Fst. 01. This was interpreted as the remains of a possible (pottery) kiln[323] – it certainly is too large for being (the remains of) a well: by comparison, the mouths of the wells in Fst. 01 and Fst. 05, which are visible on the surface, measured 1–1.5 m in diameter. If this anomaly represents the remains of a (ceramic) kiln, it is obviously an isolated one. A hampering factor being the volcanic geology that obscured clear readings of archaeological remains[324], this result was nevertheless meagre and somewhat unexpected. The question therefore is whether the archaeological zone actually encompasses (part of) the area where the ceramic workshops and kilns were situated during the Roman Imperial to Late Antique period. In the course of his excavations, Loeschcke encountered no kiln remains, and drew the conclusion that these had disappeared as a result of human and/or natural factors[325]. Perhaps so, but the new data still allow to ponder upon three scenarios for the zone as a whole: (1) most if not all remains have indeed been obliterated by subsequent activities and/or natural processes; (2) the entire area is covered by thick layers of archaeological stratigraphy (waste dumps, occupational debris, etc.), which obscure workshop/kiln remains buried deep beneath this; or (3) the survey zone – as

320 Hayes 2008, 83: »I retained Waagé's designation in *LRP*, since no exact source could then be pinpointed. This, however, subsequently became clear with the discovery in the late 1960s of extensive kiln debris and wasters at Phocea (Aiolis, northwestern Turkey). I therefore proposed the name Phocean Red Slip (PRS) ware, in line with the other regional designations now adopted for Waagé's various wares; his nomenclature has thus been finally abandoned«.

321 Hayes 2008, 51.

322 Hay et al. 2016; Hay – Kay 2017; also Pirson 2016, 181–184 especially fig. 53.

323 Hay et al. 2016, 10. 13; Hay – Kay 2017, 3.

324 Hay et al. 2016, 9.

325 Loeschcke 1912, 352.

suggested by the results of geophysical techniques – does not comprise the area where workshops and kilns were located. One find that tentatively supports this is the dense surface concentration in the northeast part of Fst. 07 which consists of large quantities of production waste (slag, lining, spacer discs, stacking devices, though there were relatively few vessel wasters) and (sometimes very large) vessel fragments representing a very limited typological repertoire (cf. supra). In fact, the preservation and apparent typological and chronological homogeneity of this concentration would not be out of place as excavated material and indicates that Fst. 07 had not been regularly ploughed over an extended period of time (more ploughing causes a greater chance of breakage). This concentration is here interpreted as the residue of a substantial waste dump which resulted from pottery manufacture, suggesting that (parts of) the area was used for dumping activities. While the waste of ceramic manufacture (slag, wasters, ash[326], etc.) may have been kept within a workshop compound for some time, at certain moments people must have disposed of it elsewhere simply because it became a burden. A clear, strong concentration of Classical-(Early) Hellenistic pottery further south-southwest in Fst. 07 (cf. supra), where the area continues to gently slope up, indicates the edge of dumping activities, at least in this area. This potentially also suggests that the original slope was (somewhat) steeper.

139 That said, workshops and kilns need not have remained spatially static during the entire period of ceramic manufacture at Pitane, a lengthy 5 centuries if not a little longer. Surely a production centre as Pitane would have had multiple workshops and kilns, even within a relatively small zone such as the area that was surveyed. In general, kilns – even poorly preserved ones – leave traces that geophysical techniques do detect and pick up. At Rheinzabern, for instance, a geomagnetic survey detected a number of dense and well-bounded anomalies varying in size, the largest of which, after having been excavated in 1981, turned out to be a ceramic kiln. Moreover, the size of each anomaly in the geomagnetic map also corresponded rather well with its actual size once it was excavated[327]. However, since the nature of this single anomaly cannot be determined, one plausible interpretation is indeed that (most) kilns and workshops were located elsewhere on the peninsula, perhaps along its western edge where harbour remains have been identified, and/or closer to or on the mainland. In fact, observations made during an initial survey within the framework of the »Kane Regional Harbour Survey«, concerning the expansion of the harbour in Pitane during the Roman Imperial period, are of great importance for the broader economic contextualisation of pottery manufacture in Pitane in the Roman Imperial and Late Antique period: the discovery of a probable mole made of opus caementicium, which was repaired during the Imperial period, and structures somewhat inland which were also made of opus caementicium, point to a massive harbour expansion during the Roman Imperial period. The harbour basin on the west side of the peninsula would have covered a maximum area of ca. 8.5 ha in the Imperial period, as the reconstruction based on these new findings suggests[328]. Thanks to the sheltered harbour basin on the west side of the peninsula and another harbour on the east, it was possible for ships to dock at Pitane relatively independent of the weather. The port of Pitane was thus considerably larger during the Roman Imperial period than the harbour basin constructed for Elaia, which measured 4.8 ha, as shown

326 Loeschcke 1912, 347.

327 Reutti 1983, 35 f., 62–66 fig. 2, 7, app. 4; Jackson et al. 2012, 96 f. fig. 8. Research carried out in an area named De Holdeurn, to the east of the city of Nijmegen (the Roman city of Ulpia Noviomagus Batavorum) in the Netherlands, gave similar results. In this area, Roman brick and tile kilns have been excavated but their exact location remained uncertain. Geophysical prospection succeeded in detecting these kiln remains, which corresponded with the old excavation plans after these had been georeferenced. See van Diepen – Polak 2009. We are sincerely grateful to Dr. Rien Polak (Radboud University, Nijmegen) for bringing this to our attention.

328 Laufer 2020, 226 pl. 40, 1 = UM15 Fst. 2.008; Feuser – Laufer 2018, 157–160 figs. 63. 64.

by Bernhard Ludwig in his discussion of landing places in the Pergamon micro-region. Ludwig concludes that this expansion of the port at Pitane could be linked to the export of goods, such as the locally manufactured tablewares. Moreover, Ludwig underlines that in view of the geographical advantages of Pitane as well as improved connections between Pitane and Pergamon through infrastructural works such as the construction of bridges, it is reasonable to assume that Pitane was another main port during the Roman Imperial period, connecting Pergamon and its micro-region with the wider Roman world[329]. These various, roughly contemporary developments on the local and regional level were neither coincidental nor did they happen in isolation. Instead, they should be seen as significant parts of larger local, regional and supraregional developments that had considerable economic and artisanal impact on the Pergamon micro-region.

329 Ludwig 2021, 99 f. For the route network between Pergamon, Pitane and Elaia based on archaeological evidence (bridges, milestones), ancient sources, historical reports, maps, and least-cost-path analyses, see Ludwig 2020, 26 fig. 24; Ludwig 2021, 97 fig. 3 tab. 1.

References

Akurgal 1960 E. Akurgal, Çandarlı (Pitane) Kazısı, TürkAD 10/1, 1960, 5 f.

Akurgal et al. 2002 E. Akurgal – M. Kerschner – H. Mommsen – W.-D. Niemeier (eds.), Töpferzentren der Ostägäis. Archäometrische und archäologische Untersuchungen zur mykenischen, geometrischen und archaischen Keramik aus Fundorten in Westkleinasien, ÖJh Ergh. 3 (Vienna 2002)

Ateş 2017 G. Ateş, Son Araştırmalar Işığında Elaia Antik Kenti ve Seramik Üretimi, MCBÜ Sosyal Bilimler Dergisi 15/1, 2017, 499–529

Ateş 2018 G. Ateş, Lokale Keramikproduktion in Elaia und ein neuer Typ der Late Roman Amphora, in: Chr. Börker – S. Japp – N. Neuenfeld – A. Keweloh-Kaletta (eds.), Amphoras in Need of Archaeology and Archaeometry. Archaeological and Archaeometric Studies of Local and Imported Amphoras in Western Asia Minor, Proceedings of the International Symposium, Berlin 06–07 July 2018, Skyllis 18/2, 2018, 122–126

Aytaçlar 2007 M. N. Aytaçlar, Problems in Determining Pottery Production Centers through Clay Analysis, Arkeoloji Dergisi 10, 2007, 55–68

Bakır 1984–1997 T. Bakır, Pitane Nekropolünde Bulunmuş Arkaik Bir Satyr, Anadolu 23, 1984–1997, 319–325

Baltazzi 1881 D. Baltazzi, Borne des Pergaméniens, BCH 5, 1881, 283–284

Baltazzi 1888 D. Baltazzi, Inscriptions de l'Eolide, BCH 12, 1888, 358–376

Bayburtluoğlu – Cook 1966 C. Bayburtluoğlu – R. M. Cook, Çandarlı (Pitane) da Bulunan Boyalı Lahitler. Painted Sarcophagi from Pitane, Anadolu 10, 1966, 179–192

Behr 1988 D. Behr, Neue Ergebnisse zur pergamenischen Westabhangkeramik, IstMitt 38, 1988, 97–178

Bernal Casasola – Sáez Romero 2006 D. Bernal Casasola – A. M. Sáez Romero, Infundibula gaditana. Acerca de los vasos troncocónicos perforados para filtrar garum y otros usos industriales en la Bahía de Cádiz, Romula 5, 2006, 167–218

Berndt 2003 M. Berndt, Funde aus dem Survey auf der Halbinsel von Milet (1992–1999). Kaiserzeitliche bis frühbyzantinische Keramik, Internationale Archäologie 79 (Rahden 2003)

Bes 2015 P. M. Bes, Once upon a Time in the East. The Chronological and Geographical Distribution of Terra Sigillata and Red Slip Ware in the Roman East, Roman and Late Antique Mediterranean Pottery 6 (Oxford 2015)

Bes 2017 P. M. Bes, Bearing the Stamp of Change: Epigraphic Stamps on Eastern Sigillata A and B, in: M. Flecker (ed.), Neue Bilderwelten. Zu Ikonographie und Hermeneutik Italischer Sigillata. Kolloquium vom 16.–18. April 2015, Tübinger Archäologische Forschungen 23 (Tübingen 2017) 241–270

Bes 2022 P. M. Bes, Overland Connections. Roman-Period Ceramic Exchange between Limyra (Lycia) and Sagalassos (Pisidia), Southwest Asia Minor, HEROM 11, 2022, 17–32

Bes – Keweloh-Kaletta 2020 P. M. Bes – A. Keweloh-Kaletta, The Intensive Survey at Çandarlı (Ancient Pitane), in: F. Pirson, Pergamon – Das neue Forschungsprogramm und die Arbeiten in der Kampagne 2019, AA 2020/2, 227–231

Bes – Keweloh-Kaletta 2021 P. M. Bes – A. Keweloh-Kaletta, The Intensive Survey at Çandarlı (Ancient Pitane). The Second Year of Survey at Çandarlı, in: F. Pirson, Pergamon – Die Arbeiten in der Kampagne 2020, AA 2021/2, 287–294

Bes – Keweloh-Kaletta 2022 P. M. Bes – A. Keweloh-Kaletta, Pitane Survey: Study Season, in: F. Pirson, Pergamon – Die Arbeiten in der Kampagne 2021, AA 2022/2, 361–364

Bes – Keweloh-Kaletta 2023 P. M. Bes – A. Keweloh-Kaletta, Pergamon: Patterns of Diversification in the Pottery Production of Pergamon and its Microregion, in: M. Bentz – M. Heinzelmann (eds.), Archaeology and Economy in the Ancient World 55. Proceedings of the 19th International Congress of Classical Archaeology, Cologne/Bonn, 22–26 May 2018. Single Contributions. Sessions 6–8, Consumption – Economy of Cult – The Role of the City (Heidelberg 2023) 343–348

Bes – Keweloh-Kaletta 2024 P. M. Bes – A. Keweloh-Kaletta, The Pitane Survey (2019–2021). The Manufacture of Terra Sigillata/Red Slip Ware within a Regional Socio-Ecological Context, in: F. Pirson – B. Schütt – T. Schultz (eds.), Micro-Regions as Spaces of Socio-Ecological Interaction. 1st Milestone Workshop of the Project »The Transformation of the Pergamon Micro-Region between the Hellenistic and the Roman Imperial Period«. Istanbul 11–12 March 2022, TuK 3 (Berlin 2024) 213–232

Biella – Michetti 2017 M. C. Biella – L. M. Michetti, Gli strumenti della produzione ceramica a Falerii: appunti per uno studio tipologico, in: M. C. Biella – R. Cascino – A. F. Ferrandes – M. Revello Lami (eds.), Gli artigiani e la città. Officine e aree produttive tra VIII e III sec. a.C. nell'Italia centrale tirrenica. Atti della giornata di studio British School at Rome, 11 gennaio 2016, Scienze dell'Antichità 23, 2 (Rome 2017) 163–170. 448

Bignasca et al. 2015 A. Bignasca – M. Lagogianni-Georgakarakos – N. Kaltsas – E. Vlachogianni (eds.), Der versunkene Schatz. Das Schiffswrack von Antikythera. Exhibition Catalogue, Antikenmuseum Basel und Sammlung Ludwig, 27.09.2015–27.03.2016 (Basel 2015)

Bittel 1950 K. Bittel, Zur ältesten Besiedlungsgeschichte der unteren Kaikos-Ebene, in: Kleinasien und Byzanz. Gesammelte Aufsätze zur Altertumskunde und Kunstgeschichte, IstForsch 17 (Berlin 1950) 10–29

Boehlau – Schefold 1942 J. Boehlau – K. Schefold, Larisa am Hermos 3. Die Ergebnisse der Ausgrabungen 1902–1934. Die Kleinfunde (Berlin 1942)

Boehringer 1959 E. Boehringer, Pergamon, in: Deutsches Archäologisches Institut (eds.), Neue deutsche Ausgrabungen im Mittelmeergebiet und im Vorderen Orient (Berlin 1959) 121–171

Boehringer – Krauss 1937 E. Boehringer – F. Krauss, Das Temenos für den Herrscherkult. »Prinzessinnen Palais«, AvP 9 (Berlin 1937)

Borriello et al. 2016 G. Borriello – M. Giglio – S. Iavarone, Nuove evidenze sulla produzione di ceramica d'età romana in area Flegrea: uno scarico di fornace da Cuma (Na), in: S. Biegert (ed.), ReiCretActa 44 (Bonn 2016) 9–18

Bounegru 1996 O. Bounegru, Notes sur les ateliers de Çandarlı, ReiCretActa 33, 1996, 105–107

Bounegru – Erdemgil 1998 O. Bounegru – S. Erdemgil, Terra-Sigillata-Produktion in den Werkstätten von Pergamon, Ketiostal. Vorläufiger Bericht, IstMitt 48, 1998, 263–277

Bounegru et al. 2001 O. Bounegru – P. Degryse – S. Erdemgil – J. Poblome – W. Viaene – M. Waelkens, The Sigillata Manufactories of Pergamon and Sagalassos, JRA 14, 2001, 143–165

Campbell 2007 E. Campbell, Continental and Mediterranean Imports to Atlantic Britain and Ireland, 400–800 A.D., Council for British Archaeology Research Report 157 (York 2007)

Carandini 1981 A. Carandini, Terra sigillata pergamena (« Eastern Sigillata C » o di « Çandarlı »), in: Atlante delle forme ceramiche I: ceramica fine romana nel bacino mediterraneo (medio e tardo imperio). Enciclopedia dell'arte antica. Classica e orientale (Rome 1981) 231

Cavalieri Manasse et al. 2016 G. Cavalieri Manasse – C. Mondin – R. Stuani, Nota preliminare sull'officina ceramica di piazza Arditi D'Italia a Verona, in: S. Biegert (ed.), ReiCretActa 44 (Bonn 2016) 61–71

Chenet – Gaudron 1955 G. Chenet – G. Gaudron, La céramique sigillée d'Argonne des IIe et IIIe siècles. Gallia Supplément VI (Paris 1955)

Cook – Dupont 1998 R. M. Cook – P. Dupont, East Greek Pottery (London 1998)

Courty et al. 1989 M.-A. Courty – P. Goldberg – R. Macphail, Soils and Micromorphology in Archaeology (Cambridge 1989)

Cracolici 2003 V. Cracolici, I sostegni di fornace dal Kerameikos di Metaponto, Beni Archeologici – Conocenza e Tecnologie Quaderno 3 (Bari 2003)

Daskalov – Todorova 2018 M. Daskalov – E. Todorova, At the Threshold – Pottery Kilns for Sgraffito Ware and Günsenin IV-like Jars (Late 14th – Early 15th c. A.D.) from Urdoviza (Kiten) on the Western Black Sea Coast, in: F. Yenişehirlioğlu (ed.), XIth Congress on medieval and Modern Period Mediterranean Ceramics Proceedings. 19–24 October 2015 Vol. 1 (Ankara 2018) 217–226

Daszkiewicz 2014 M. Daszkiewicz, Ancient Pottery in the Laboratory. Principles of Archaeoceramological Investigations of Provenance and Technology, Novensia 25, 2014, 177–197

De Luca 2021 G. De Luca (supplemented and edited by P. Kögler), Hellenistische Reliefkeramik aus Pergamon. Die ›Megarischen Becher‹ von der Akropolis, aus dem Asklepieion, der Stadtgrabung und weiteren Fundorten, PF 18 (Berlin 2021)

De Luca – Radt 1999 G. De Luca – W. Radt, Sondagen im Fundament des Großen Altars, PF 12 (Berlin 1999)

Degeest 2000 R. Degeest, The Common Wares of Sagalassos, Studies in Eastern Mediterranean Archaeology 3 (Turnhout 2000)

Dereboylu Poulain et al. 2018 E. Dereboylu Poulain – P. Taşpınar – M. Arinç, 2017 Yılı Myrina ve Gryneion Arkeolojik Yüzey Araştırması Seramik Buluntuları, in: M. Çekilmez – E. Dereboylu Poulain – E. Erdan (eds.), Myrina ve Gryneion Arkeolojik Yüzey Araştırmaları (MYGAR), Son Araştırmalar ve Disiplinler Arası Çalışmalar 2, Aliağa Kent Kitaplığı 6 (Izmir 2018) 61–96

van Diepen – Polak 2009 L. van Diepen – M. Polak, Resten van de steen- en pottenbakkerij van het Romeinse leger op Landgoed Holthurnsche Hof in Berg en Dal (gem. Groesbeek), Auxiliaria 8 (Nijmegen 2009)

Domżalski 2014 K. Domżalski, The Pitane Workshop and the most Succesful Export of Eastern Sigillata C, in: H. Meyza (ed.), Late Hellenistic to Mediaeval Fine Wares of the Aegean Coast of Anatolia. Their Production, Imitation and Use, Travaux de l'Institut des cultures méditerranéennes et orientales de l'Académie polonaise des sciences 1 (Warsaw 2014) 151–160

Dörpfeld 1910 W. Dörpfeld, Die Arbeiten zu Pergamon 1908–1909, AM 35, 1910, 345–526

Dragendorff 1897 H. Dragendorff, Zur Terra-Sigillata-Industrie in Griechenland, Kleinasien, Südrussland und Ägypten, BJb 101, 1897, 140–152

Dupont 1983 P. Dupont, Classification et détermination de provenance des céramiques orientales archaïques d'Istros. Rapport préliminaire, Dacia 27, 1983, 19–43

Edwards 1965 G. R. Edwards, The Hellenistic Pottery from the Shipwreck of Antikythera, in: Weinberg et al. 1965, 18–27

Empereur – Picon 1986 J.-Y. Empereur – M. Picon, A propos d'un nouvel atelier de »Late Roman C«, Figlina 7, 1986, 143–146

Engels 2021 B. Engels, Das Grottenheiligtum am Osthang. Eine Mikrostudie zur späthellenistischen Kultpraxis, PF 17 (Wiesbaden 2021)

Engels et al. 2012 B. Engels – S. Japp – A. Keweloh, Aktuelle Ergebnisse der Keramikbearbeitung in Pergamon – Eine neue Definition von Eastern Sigillata C/Pergamenischer Sigillata, in: F. Pirson, Pergamon – Bericht über die Arbeiten in der Kampagne 2011, AA 2012/2, 251–255

Engels et al. 2013 B. Engels – S. Japp – A. Keweloh, Aktuelle Forschungen der Fundbearbeitung – Zweifarbigkeit durch Stapeltechnik als intendiertes Dekorelement der pergamenischen Keramikproduktion, in: F. Pirson, Pergamon – Bericht über die Arbeiten der Kampagne 2012, AA 2013/2, 134–138

Ettlinger et al. 1990 E. Ettlinger – B. Hedinger – B. Hoffmann – P. M. Kenrick – G. Pucci – K. Roth-Rubi – G. Schneider – S. von Schnurbein – C. M. Wells – S. Zabehlicky-Scheffenegger, Conspectus Formarum Terrae Sigillatae Italico Modo Confectae, Materialien zur römisch-germanischen Keramik 10 (Bonn 1990)

Fernández 2014 A. Fernández, El comercio tardoantiguo (ss. IV-VII) en el noroeste peninsular a través del registro cerámico de la ría de Vigo, Roman and Late Antique Mediterranean Pottery 5 (Oxford 2014)

Feuser – Laufer 2018 S. Feuser – E. Laufer, Survey auf der Kane-Halbinsel (Kane Regional Harbour Survey) – Abschlußkampagne 2017, in: F. Pirson, Pergamon. Bericht über die Arbeiten in der Kampagne 2017, AA 2018/2, 150–167

Fırat 2011 M. Fırat, Phokaia Geç Roma Dönemi Mutfak Kapları (Ph.D. diss. Ege Üniversitesi, Izmir 2011)

Flügel 1978 E. Flügel, Mikroskopische Untersuchungsmethode von Kalken (Berlin 1978)

Freyer-Schauenburg 1973 B. Freyer-Schauenburg, Die Glasfunde aus Pitane (Çandarlı), Anadolu 17, 1973, 141–175

Gassner 1997 V. Gassner, Das Südtor der Tetragonos-Agora. Keramik und Kleinfunde, FiE 13, 1, 1 (Vienna 1997)

Giannopoulou 2020 M. Giannopoulou, Οι κλίβανοι των εργαστηρίων κεραμικές: Διαχρονική και συγκριτική εξέταση, συμβολή στην αρχαιολογική έρευνα/Kilns in Pottery Workshops: Diachronic and Comparative Study, Contribution to Archaeological Research, in: S. Drougou (ed.), Κεραμεία. Τεχνίτες και εργαστήρια/Pottery Workshops. Craftsmen and Workshops (Athens 2020) 198–253

Gose 1957 E. Gose, Siegfried Loeschcke zum Gedächtnis, in: Vierteljahresblätter der Trierer Gesellschaft für nützliche Forschungen 3, 1957, 13 f.

Groh et al. 2013 S. Groh – S. Ladstätter – A. Waldner, Neue Ergebnisse zur Urbanistik in der Oberstadt von Ephesos: Intensive and extensive Surveys 2002–2006, ÖJh 82, 2013, 93–194

Hay et al. 2016 S. Hay – S. Kay – E. Maw, Pitane, Turkey. Including a Report on Kane. Geophysical Survey Report (Internal Report 2016)

Hay – Kay 2017 S. Hay – S. Kay, Pitane and Kane Geophysics Report 2017 (Internal Report 2017)

Hayes 1972 J. W. Hayes, Late Roman Pottery. A Catalogue of Roman Fine Wares (London 1972)

Hayes 1980 J. W. Hayes, A Supplement to Late Roman Pottery (London 1980)

Hayes 1983 J. W. Hayes, The Villa Dionysos Excavations, Knossos: The Pottery, BSA 78, 1983, 97–169

Hayes 1985 J. W. Hayes, Sigillate orientale, in: Atlante della forme ceramiche II: ceramica fine romana nel bacino mediterraneo (tardo ellenismo e primo imperio). Enciclopedia dell'arte antica. Classica e orientale (Rome 1985) 1–96

Hayes 1997 J. W. Hayes. Handbook of Mediterranean Roman Pottery (London 1997)

Hayes 2008 J. W. Hayes. Roman Pottery. Fine Ware Imports: Typology, Agora 32 (Princeton 2008)

Hayes – Slane 2022 J. W. Hayes – K. W. Slane, Late Classical, Hellenistic, and Roman Pottery, Isthmia 11 (Athens 2022)

Heinle 2015 M. Heinle, Eine historische Landeskunde der Aiolis, Byzas 20 (Istanbul 2015)

Homann-Wedeking 1938 E. Homann-Wedeking, Archaische Vasenornamentik in Attika, Lakonien und Ostgriechenland (Athens 1938)

Hübner 1993 G. Hübner, Die Applikenkeramik von Pergamon. Eine Bildersprache im Dienst des Herrscherkultes, PF 7 (Berlin 1993)

Iren 2002 K. Iren, Die Werkstatt des Londoner Dinos: Eine phokäische Werkstatt?, IstMitt 52, 2002, 165–206

Iren 2003 K. Iren, Aiolisch orientalisierende Keramik (Istanbul 2003)

Isler 1969 H. Isler, Heraion von Samos. Eine frühbyzantinische Zisterne, AM 84, 1969, 202–230

Jackson et al. 2012 M. Jackson – M. Zelle – L. Vandeput – V. Köse, Primary Evidence for Late Roman D Ware Production in Southern Asia Minor. A Challenge to ›Cypriot Red Slip Ware‹, AnSt 62, 2012, 89–114

Japp 2009 S. Japp, Archäometrisch-archäologische Untersuchungen an Keramik aus Pergamon und Umgebung, IstMitt 59, 2009, 193–268

Japp 2013 S. Japp, Pottery Production in Pergamon. A Short Overview, in: N. Fenn – Chr. Römer-Strehl (eds.), Networks in the Hellenistic World. According to the Pottery in the Eastern Mediterranean and Beyond, BARIntSer 2539 (Oxford 2013) 165–172

Japp 2014 S. Japp, Sigillata of Pergamon. Eastern Sigillata C. Problems of Classification and Chronology, in: H. Meyza (ed.), Late Hellenistic to Mediaeval Fine Wares of the Aegean Coast of Anatolia. Their Production, Imitation and Use. Travaux de l'Institut des cultures méditerranéennes et orientales de l'Académie polonaise des sciences 1 (Warsaw 2014) 11–22

Japp 2021 S. Japp, Archäologisch-archäometrische Auswertung der RFA-Analysen an hellenistischen Reliefbechern aus Pergamon, in: De Luca 2021, 178 f.

Japp et al. 2013 S. Japp – G. Schneider – H. Mommsen, Archäologisch-archäometrische Hinweise auf weitere Produktionsorte der Late Roman C Ware, in: A. Hauptmann – O. Mecking – M. Prange (eds.), Archäometrie und Denkmalpflege 2013. Jahrestagung an der Bauhaus-Universität Weimar, Metalla Sonderheft 6 (Bochum 2013) 164–168

Japp et al. 2016 S. Japp – B. Engels –A. Keweloh, Kiln Stacking as a Technique for Polychrome Surface Design – An Innovative Technique?, in: S. Japp – P. Kögler (eds.), Traditions and Innovations. Tracking the Development of Pottery from the Late Classical to the Early Imperial Periods, International Association for Research on Pottery of the Hellenistic Period 1 (Vienna 2016) 307–315

Kalcev 1991 K. Kalcev, Zur Herstellung der antiken Keramik in Augusta Trajana/Stara Zagora, ReiCretActa 29, 1991, 245–273

Kenyon 1957 K. M. Kenyon, Roman and Later Wares. 1. Terra Sigillata, 2. Stratified Groups, in: J. W. Crowfoot – G. M. Crowfoot – K. M. Kenyon, The Objects from Samaria, Samaria- 3 (London 1957) 281–306

Kerschner 2006 M. Kerschner, On the Provenance of Aiolian Pottery, in: A. Villing – U. Schlotzhauer (eds.), Naukratis: Greek Diversity in Egypt. Studies on East Greek Pottery and Exchange in the Eastern Mediterranean (London 2006) 109–126

Kerschner 2017 M. Kerschner, East Greek Pottery Workshops in the Seventh Century B.C. Tracing Regional Styles, in: X. Charalambidou – C. Morgan (eds.), Interpreting the Seventh Century B.C. Tradition, Innovation and Meaning (Oxford 2017) 100–113

Kögler 2010 P. Kögler, Feinkeramik aus Knidos vom mittleren Hellenismus bis in die mittlere Kaiserzeit (ca. 200 v. Chr. bis 150 n. Chr.) (Wiesbaden 2010)

Ladstätter – Sauer 2005 S. Ladstätter – R. Sauer, Late Roman C-Ware und lokale spätantike Feinware aus Ephesos, in: F. Krinzinger (ed.), Spätantike und mittelalterliche Keramik aus Ephesos, AF 13 (Vienna 2005) 143–201

Lancaster 2012 L. C. Lancaster, Ash Mortar and Vaulting Tubes: Agricultural Production and the Building Industry in North Africa, in: S. Camporeale – H. Dessales – A. Pizzo (eds.), Arqueología de la construcción III. Los procesos constructivos en el mundo romano: la economía de las obras, École Normale Supérieure, París, 10–11 de diciembre de 2009), Archivo Español de Arqueología Suppl. 64 (Madrid 2012) 145–160

Langlotz 1969 E. Langlotz, Beobachtungen in Phokaia, AA 1969, 377–385

Lätzer-Lasar 2012 A. Lätzer-Lasar, Import oder indigen? Methodische Überlegungen zu Fabricbestimmungen pergamenischer Importkeramik in Ephesos, in: B. Ramminger – O. Stilborg (eds.), Naturwissenschaftliche Analysen vor- und frühgeschichtlicher Keramik II. Methoden, Anwendungsbereiche, Auswertungsmöglichkeiten. Dritter und vierter internationaler Workshop für junge Wissenschaftlerinnen und Wissenschaftler in Hamburg am 13. Februar 2010 und 5. Februar 2011, Universitätsforschungen zur Prähistorischen Archäologie 216 (Bonn 2012), 217–228

Lätzer-Lasar 2020 A. Lätzer-Lasar, Die vermeintlich pergamenische Importkeramik in Ephesos. Studien zur Typologie, Provenienz und Herstellungstechnik von so genannter Weißgrundiger Ware, Applikenkeramik und pergamenischer Sigillata (Oxford 2020)

Laufer 2015 E. Laufer, Survey auf der Kane-Halbinsel (Kane Regional Harbour Survey) 2014, in: F. Pirson, Pergamon – Bericht über die Arbeiten in der Kampagne 2014, AA 2015/2, 139–150

Laufer 2016 E. Laufer, Survey auf der Kane-Halbinsel (Kane Regional Harbour Survey) 2015, in: F. Pirson, Pergamon – Bericht über die Arbeiten in der Kampagne 2015, AA 2016/2, 174–185

Laufer 2020 E. Laufer, Die urbanistische Entwicklung von Kane und Pitane. Ergebnisse des Kane Regional Harbour Survey 2014–2015, in: E.-M. Mohr – K. Rheidt – N. Arslan (eds.), Urbanism and Architecture in Ancient Aiolis. Proceedings of the International Conference from 7th–9th April 2017 in Çanakkale, AMS 95 (Bonn 2020)

Le Bomin 2020 J. Le Bomin, Mediterranean Pottery Imports in Western Gaul during the Late Roman Period (Mid 3rd–Early 7th Century A.D.). State of Knowledge, in: M. Duggan – S. Turner – M. Jackson (eds.), Ceramics and Atlantic Connections: Late Roman and Early Medieval Imported Pottery on the Atlantic Seaboard. International Symposium, Newcastle University, March 26th–27th 2014, Roman and Late Antique Mediterranean Pottery 15 (Oxford 2020) 39–54

Loeschcke 1909 S. Loeschcke, Keramische Funde in Haltern. Ein Beitrag zur Geschichte der augusteischen Kultur in Deutschland (Ph.D. diss. Rheinische Friedrich-Wilhelms-Universität Bonn 1909)

Loeschcke 1912 S. Loeschcke, Sigillata-Töpfereien in Tschandarli (Bericht über die Ergebnisse einer Versuchsgrabung i. J. 1911), AM 27, 1912, 344–407

Lüdorf 2006 G. Lüdorf, Römische und frühbyzantinische Gebrauchskeramik im westlichen Kleinasien. Typologie und Chronologie, Internationale Archäologie 96 (Rahden 2006)

Ludwig 2020 B. Ludwig, Reconstructing the Ancient Route Network in Pergamon's Surroundings, Land 9, 8, 2020, 241, 1–39, https://doi.org/10.3390/land9080241

Ludwig 2021 B. Ludwig, Pergamon's Access to the Sea. Analysis of its Landing Sites with a Focus on Connectivity and Visibility, in: U. Mania (eds.), Hafen, Stadt, Mikroregion. Beiträge der Arbeitsgruppe 5 »Hafenorte« des Forschungsclusters 6 »Connecting Cultures« und einer Tagung am 26. und 27. Mai 2017 an der Abteilung Istanbul des DAI, MKT 18 (Wiesbaden 2021) 91–108

Lund 2005 J. Lund, An Economy of Consumption: The Eastern Sigillata A Industry in the Late Hellenistic Period, in: Z. H. Archibald – J. K. Davies – V. Gabrielsen (eds.), Making, Moving and Managing. The New World of Ancient Economies, 323–31 B.C. (Oxford 2005) 233–252

Matera 2015 M. Matera, Using, Reusing and Repairing Pottery: The Example of Two Small Bosporan Centres – Tanais and Tyritake (Everyday Life, Economic Status, Wealth and the Resourcefulness of the Population), in: G. R. Tsetskhladze – A. Avram – J. Hargrave (eds.), The Danubian Lands between the Black, Aegean and Adriatic Seas (7th Century B.C.–10th Century A.D.). Proceedings of the Fifth International Congress on Black Sea Antiquities (Belgrade – 17–21 September 2013 (Oxford 2015) 423–429

Mayet – Picon 1986 F. Mayet – M. Picon, Une sigillee phoceenne tardive (»Late Roman C ware«) et sa diffusion en Occident, Figlina 7, 1986, 129–142

Merten 2000 J. Merten, Loeschcke, Siegfried, in: H. Monz (eds.), Trierer biographisches Lexikon (Trier 2000) 270

Merten 2013 J. Merten, Das Rheinische Landesmuseum Trier 1920–1945, in: J. Kunow – T. Otten – J. Bemann (eds.), Archäologie und Bodendenkmalpflege in der Rheinprovinz 1920–1945. Tagung im Forum Vogelsang, Schleiden, 14.–16. Mai 2012, Materialien zur Bodendenkmalpflege im Rheinland 24 (Trier 2013) 183–201

Meyer-Schlichtmann 1988 C. Meyer-Schlichtmann, Die pergamenische Sigillata aus der Stadtgrabung von Pergamon. Mitte 2. Jh. v. Chr. – Mitte 2. Jh. n. Chr., PF 6 (Berlin 1988)

Meyza 2007 H. Meyza, Cypriot Red Slip Ware: Studies on a Late Roman Levantine Fine Ware, Nea Paphos 5 (Warsaw 2007)

Mohr 2015 E.-M. Mohr, Eisenzeitliche Nekropolen im Westlichen Kleinasien. Struktur und Entwicklung zwischen dem 9. und 6. Jh. v. Chr., Byzas 21 (Istanbul 2015)

Mommsen – Japp 2009 H. Mommsen – S. Japp, Neutronenaktivierungsanalysen von 161 Keramikproben aus Pergamon und Fundorten der Region, IstMitt 59, 2009, 269–286

Murphy – Poblome 2012 E. A. Murphy – J. Poblome, Technical and Social Considerations of Tools from Roman-Period Ceramic Workshops at Sagalassos (Southwest Turkey): Not just Tools of the Trade?, JMedA 25/2, 2012, 197–217

Nohlen – Radt 1978 K. Nohlen – W. Radt, Kapıkaya. Ein Felsheiligtum bei Pergamon, AvP 12 (Berlin 1978)

Orton et al. 1993 C. Orton – P. Tyers – A. Vince, Pottery in Archaeology (Cambridge 1993)

Özden Gerçeker 2020 G. S. Özden Gerçeker, A Typological Assessment on the Examples of Eastern Sigillata D and Late Roman D Koinai from Perge-Lot 159, in: A. Mörel – G. Kaşka – H. Köker – M. Kaşka – M. Fırat – S. O. Akgönül (eds.), Pisidia ve Yakın Çevresinde Üretim, Ticaret ve Ekonomi/Production, Trade and Economy in Pisidia and its Surrounding Areas). International Symposium Proceedings Pisidian Studies II, 31 October–03 November 2018, Isparta, Turkey (Isparta 2020) 305–319

Özyiğit 2003 Ö. Özyiğit, 2002 Yılı Phokaia Kazı Çalışmaları, KST 25/1, 2003, 441–453

Philippson 1911 S. Philippson, Zur Geographie der unteren Kaikos-Ebene in Kleinasien, Hermes 46/2, 1911, 254–260

Pirson 2008 F. Pirson, Pergamon – Bericht über die Arbeiten in der Kampagne 2007, AA 2008/2, 83–155

Pirson 2016 F. Pirson, Pergamon – Bericht über die Arbeiten in der Kampagne 2015, AA 2016/2, 135–223

Pirson et al. 2024 F. Pirson – B. Schütt – T. Schulz – G. Ateş – D. Knitter – U. Mania, Introduction: Micro-Region and Social Ecology, in: F. Pirson – B. Schütt – T. Schultz (eds.), Micro-Regions as Spaces of Socio-Ecological Interaction. 1st Milestone Workshop of the Project »The Transformation of the Pergamon Micro-Region between the Hellenistic and the Roman Imperial Period«. Istanbul 11–12 March 2022, TuK 3 (Berlin 2024) 1–9

Poblome 1999 J. Poblome, Sagalassos Red Slip Ware. Typology and Chronology, Studies in Eastern Mediterranean Archaeology 3 (Turnhout 1999)

Poblome – Fırat 2011 J. Poblome – N. Fırat, Late Roman D. A Matter of Open(ing) or Closed Horizons?, in: M. A. Cau Ontiveros – P. Reynolds – M. Bonifay (eds.), Late Roman Fine Wares. Solving Problems of Typology and Chronology. A Review of the Evidence, Debate and New Contexts. Late Roman Fine Wares 1, Roman and Late Antique Mediterranean Pottery 1 (Oxford 2011) 49–55

Pülz 1987 S. Pülz, Zwei Keramikkomplexe aus dem Heroon III, IstMitt 37, 1987, 34–69

Radbauer 2003 S. Radbauer, Produktionszuweisung bei Terra Sigillata durch Scherbenklassifizierung, in: B. Liesen – U. Brandl (eds.), Römische Keramik. Herstellung und Handel. Kolloquium Xanten 15.–17.06.2000, Xantener Berichte 13 (Mainz 2003) 43–75

Reinach 1891 S. Reinach, Chroniques d'Orient. Documents sur les fouilles et découvertes dans l'Orient hellénique de 1883 à 1890 (Paris 1891)

Reutti 1983 F. Reutti, Tonverarbeitende Industrie im römischen Rheinzabern. Vorbericht für die Grabungen der Jahre 1978–1981, Germania 61/1, 1983, 33–69

Reynolds 1995 P. Reynolds, Trade in the Western Mediterranean, AD 400–700: The Ceramic Evidence, BARIntSer 604 (Oxford 1995)

Rice 2015 P. M. Rice, Pottery Analysis. A Sourcebook [2](Chicago 2015)

Rotroff 1982 S. I. Rotroff, Hellenistic Pottery. Athenian and Imported Moldmade Bowls. Agora 22 (Princeton 1982)

Rotroff 1997 S. I. Rotroff, Hellenistic Pottery. Athenian and Imported Wheelmade Table Ware and Related Material, Agora 29 (Princeton 1997)

Rotroff – Oliver 2003 S. I. Rotroff – A. Oliver Jr., The Hellenistic Pottery from Sardis: the Finds through 1994, Archaeological Explorations of Sardis Monographs 12 (Cambridge (MA) 2003)

Şahin 2020 R. Şahin, Spätantike Sigillaten aus Adramytteion (Ören/Balıkesir). Eine Überregionale Materialanalyse, AnadoluAraş 23, 2020, 215–259

Schäfer 1962 J. Schäfer, Terra Sigillata aus Pergamon, AA 1962, 777–802

Schäfer 1968 J. Schäfer, Die hellenistische Keramik aus Pergamon, PF 2 (Berlin 1968)

Schneider 2021 G. Schneider, Röntgenfluoreszenzanalysen von hellenistischen Reliefbechern aus Pergamon, in: De Luca 2021, 177

Schneider – Japp 2009 G. Schneider – S. Japp, Röntgenfluoreszenzanalysen von 115 Keramikproben aus Pergamon, Çandarlı, Elaia und Atarneus (Türkei), IstMitt 59, 2009, 287–306

Schneider – Mommsen 2009 G. Schneider – H. Mommsen, Eastern Sigillata C von Pergamon und Çandarlı (Türkei). Ein Methodenvergleich von WD-XRF und NAA, in: A. Hauptmann – H. Stege (eds.), Archäometrie und Denkmalpflege 2009, Metalla Sonderheft 2 (Bochum 2009) 223– 225

Schuchhardt 1899 C. Schuchhardt, Aus der pergamenischen Landschaft, in: A. Conze – C. Schuchhardt, Die Arbeiten zu Pergamon 1886–1898, AM 24, 1899, 143–158

Schuchhardt 1912 C. Schuchhardt, Historische Topographie der Landschaft, in: A. Conze, Stadt und Landschaft, AvP I, 1 (Berlin 1912) 61–143

Shipley 2018 G. Shipley, Why Innovate? Between Politics, the Market, and Material Culture at the Dawn of Eastern Sigillata, in: S. Drougou (ed.), 9th Scientific Meeting on Hellenistic Pottery. Thessaloniki December 5–9th 2012 (Athens 2018) 15–27

Sliwka 2020 F. Sliwka, Die Eastern Sigillata C aus der Sammlung des Winckelmann-Instituts. Eine Form- und Fabrikatsanalyse von Fundkeramik-Proben aus Siegfried Loeschckes Altgrabung in Pitane (MA thesis Humboldt-Universität zu Berlin 2020)

Sliwka 2023 F. Sliwka, »Zahllose Scherben aus Terra Sigillata«. Siegfried Loeschckes Grabung im antiken Pitane und die Keramikproben am heutigen Winckelmann-Institut der Humboldt-Universität zu Berlin, in: B. Sporleder, Sammeln um jeden Preis. Die Entstehung der archäologischen Sammlung an der Berliner Universität im Kontext des Antikenhandels im frühen 20. Jahrhundert, Schriften des Winckelmann-Instituts der Humboldt-Universität zu Berlin 1 (Heidelberg 2023) 145–152

Soyaker – Nalbantoğlu 1999 S. Soyaker – C. Nalbantoğlu, Çandarlı'da Yapılan Kurtarma Kazısı, in: IX Müze Kurtarma Kazıları Semineri. 27–29 Nisan 1998, Anıtlar ve Müzeler Genel Müdürlüğü Yayınları 64 (Antalya 1999) 1–10

Sultov 1985 B. Sultov, Ancient Ceramic Production on the Territory of Nicopolis ad Istrum (2nd-4th century A.D., Annuaire de l'Université de Sofia »Kliment Ohridski« Faculté d'Histoire LXXVI, 2 (Sofia 1985)

Thrämer 1888 E. Thrämer, Pergamos. Untersuchungen über die Frühgeschichte Kleinasiens und Griechenlands (Leipzig 1888)

Tuna-Nörling 1995 Y. Tuna-Nörling, Die Ausgrabungen von Alt-Smyrna und Pitane. Die attisch-schwarzfigurige Keramik und der attische Keramikexport nach Kleinasien (Tübingen 1995)

Ustura 2006 N. Ustura (eds.), Bergama Müzesi, Belleten 15 (Bergama 2006)

Vaag 2001 L. E. Vaag, The Stamped Decoration on Phocaean Red Slip Ware, in: J. Fleischer – J. Lund – M. Nielsen (eds.), Late Antiquity: Art in Context, Copenhagen, Acta Hyperborea 8 (Copenhagen 2001) 215–233

Vaag 2003 L. E. Vaag, A Closer Look at the Making of Phocaean Red Slip Ware Bowls, in: C. Abadie-Reynal (ed.), Les céramiques en Anatolie aux époques hellénistique et romaine. Actes de la Table Ronde d'Istanbul, 22–24 mai 1996, Varia Anatolica 15 (Paris 2003) 203–207

Vaag 2005 L. E. Vaag, Phocaean Red Slip Ware – Main and Secondary Productions, in: M. Berg Briese – L. E. Vaag (eds.), Trade Relations in the Eastern Mediterranean from the Late Hellenistic Period to Late Antiquity: The Ceramic Evidence. Acts from a Ph.D.-Seminar for Young Scholars, Sandbjerg Manorhouse, 12–15 February 1998, Halicarnassian Studies 3 (Odense 2005) 132–138

Vivliodetis 2015 E. Vivliodetis, Die Lagynoi, in: Bignasca et al. 2015, 164–171

Waldner – Ladstätter 2014 A. Waldner – S. Ladstätter, Ephesus – Local vs Import: The Early Byzantine Fine Ware, in: H. Meyza (ed.), Late Hellenistic to mediaeval Fine Wares of the Aegean Coast of Anatolia. Their Production, Imitation and Use, Travaux de l'Institut des Cultures méditerrannéennes et orientales de l'Academie et Orientales Polonaises de Sciences 1 (Warsaw 2014) 49–58

Weinberg et al. 1965 G. D. Weinberg – V. R. Grace – G. R. Edwards – H. S. Robinson – P. Throckmorton – E. K. Ralph, The Antikythera Shipwreck Reconsidered, TransactAmPhilosSoc (N. S.) 55/3, 1965, 3–48

Wintermeyer 2004 U. Wintermeyer, Die hellenistische und frühkaiserzeitliche Gebrauchskeramik: auf Grundlage der stratifizierten Fundkeramik aus dem Bereich der Heiligen Straße, Didyma III, 2 (Mainz 2004)

Zahn 1904 R. Zahn, Thongeschirr, in: Th. Wiegand – H. Schrader, Priene. Ergebnisse der Ausgrabungen und Untersuchungen in den Jahren 1895–1898 (Berlin 1904) 394–468

Zelle 1997 M. Zelle, Die Terra Sigillata aus der Westtor-Nekropole in Assos, AMS 27 (Bonn 1997)

Ziegenaus – De Luca 1968 O. Ziegenaus – G. De Luca, Das Asklepieion. 1. Teil. Der südliche Temenosbezirk in hellenistischer und frührömischer Zeit, AvP XI, 1 (Berlin 1968)

ZUSAMMENFASSUNG

Die Herstellung von Eastern Sigillata C und Late Roman C in Çandarlı, dem antiken Pitane

Ergebnisse eines intensiven Surveys (2019–2021)

Philip M. Bes – Anneke Keweloh-Kaletta

Dieser Artikel stellt die Ergebnisse eines intensiven archäologischen Surveys im modernen Çandarlı (antiken Pitane) vor, das seit 1911 als Herstellungsort für Terra Sigillata in den ersten drei Jahrhunderten n. Chr. bekannt ist. Im Rahmen des TransPergMikro-Projekts wurde die archäologische Zone im Zentrum der Çandarlı-Halbinsel in den Jahren 2019 und 2020 systematisch begangen, um die lokale Keramikherstellung als Teil einer breiteren handwerklichen und wirtschaftlichen Entwicklung innerhalb der Mikroregion Pergamon während der hellenistischen und römischen Kaiserzeit zu untersuchen und zu dokumentieren. Der Survey erbrachte eine umfangreiche und reichhaltige Sammlung von Artefakten, die 2021 vollständig untersucht wurde und ein klareres Bild des typologischen Repertoires sowie der technologischen Aspekte der eigentlichen Herstellung und des Brennens vermittelt. Eines der interessantesten Ergebnisse war die Entdeckung archäologischer Beweise für die lokale Produktion von Late Roman C-Ware, was bedeutet, dass die Geschirrherstellung in Pitane bis in die Spätantike hinein andauerte.

SCHLAGWÖRTER

Pitane, Eastern Sigillata C, Late Roman C, archäologischer Survey, römische Keramikherstellug

ÖZET

Çandarlı´da (Pitane) Eastern Sigillata C ve Late Roman C Üretimi

İntensif Yüzey Araştırmasının Sonuçları (2019–2021)

Philip M. Bes – Anneke Keweloh-Kaletta

Bu makalede, MS 1.–3. yüzyılda terra sigillata üretimiyle bilinen Çandarlı´daki arkeolojik yüzey araştırmalarının sonuçları tanıtılmaktadır. Buradaki üretimin varlığı 1911´de saptanmıştır. 2019 ile 2020 yılında, Çandarlı Yarımadası´nın merkezindeki arkeolojik alan, »Pergamon Mikro Bölgesinin Dönüşümü« (TransPergMikro-Projekt) adlı proje çerçevesinde sistemli olarak taranmıştır. Yüzey araştırmasının amacı, Pergamon´un Hellenistik ve Roma dönemi zanaat ve ekonomiye dayalı daha büyük bir gelişimin bir parçası olan yerel seramik üretimini araştırmak ve belgelemektir. Bu sayede son derece zengin bir buluntu topluluğu elde edilmiştir. Değerlendirmelerin 2021 yılında tamamlanmasıyla form repertuarı, seramik yapımı ve fırınlamaya yönelik teknik konular açıklığa kavuşmuştur. Arkeolojik kanıtlar sayesinde ulaşılan en ilginç sonuçlardan biri, Late Roman C grubunun burada ilginç buluntulardan birisi, Late Roman C grubu seramiklerinin yerel üretimine dair arkeolojik kanitlardir. Bu durum, Pitane´deki seramik üretiminin Geç Antik Dönem´e kadar devam ettiğini göstermektedir.

ANAHTAR SÖZCÜKLER

Pitane, Eastern Sigillata C, Late Roman C, arkeolojik yüzey araştırması, Roma Dönemi seramik üretimi

SOURCES OF ILLUSTRATIONS

Title page: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 1: Google Earth (Ulrich Mania – Philip M. Bes)
Fig. 2: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 3: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 4: drone photographs: Berslan Korkut; image: Bernhard Ludwig
Fig. 5: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 6: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 7: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 8: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 9: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 10: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 11: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 12: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 13: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 14: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 15: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 16: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 17: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 18: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 19: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 20: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 21: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 22: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 23: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 24: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 25: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 26: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 27: Lars Heinze, ArchaeoConnect GmbH
Fig. 28: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes – Anneke Keweloh-Kaletta)
Fig. 29: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 30: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 31: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 32: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 33: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 34: Pergamon Archive of the DAI, Istanbul – Berlin (original pencil drawings: Felicia Kant; digitisation: Philip M. Bes)
Fig. 35: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)
Fig. 36: Pergamon Archive of the DAI, Istanbul – Berlin (Anneke Keweloh-Kaletta – Philip M. Bes)
Fig. 37: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 38: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 39: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 40: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 41: (Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 42: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 43: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 44: Pergamon Archive of the DAI, Istanbul – Berlin (Bernhard Ludwig)
Fig. 45: Pergamon Archive of the DAI, Istanbul – Berlin (Philip M. Bes)

ADDRESSES

Dr. Philip Misha Bes
Independent researcher
Schwenkgasse 21/10
1120 Vienna
Austria
philipmbes@gmail.com
ORCID-iD: https://orcid.org/0000-0002-0504-8017

Anneke Keweloh-Kaletta
German Archaeological Institute, Istanbul Department
Inönü Caddesi 10
34437 Gümüssuyu-Istanbul
Türkiye
Anneke.Keweloh-Kaletta@dainst.de
ORCID-iD: https://orcid.org/0009-0007-0647-7845

METADATA

Titel/*Title*: Die Herstellung von Eastern Sigillata C und Late Roman C in Çandarlı, dem antiken Pitane. Ergebnisse eines intensiven Surveys (2019–2021)/*The Manufacture of Eastern Sigillata C and Late Roman C at Çandarlı, Ancient Pitane. Results of the Intensive Survey (2019–2021)*
Band/*Issue*: IstMitt 74, 2024
Bitte zitieren Sie diesen Beitrag folgenderweise/*Please cite the article as follows*: P. M. Bes – A. Keweloh-Kaletta, The Manufacture of Eastern Sigillata C and Late Roman C at Çandarlı, Ancient Pitane. Results of the Intensive Survey (2019–2021), IstMitt 74, 2024, § 1–139, https://doi.org/10.34780/96df-8en9

DOI: https://doi.org/10.34780/96df-8en9
Schlagwörter/*Keywords*: Pitane, Eastern Sigillata C, Late Roman C, archäologischer Survey, römische Keramikherstellug/*Pitane, Eastern Sigillata C, Late Roman C, archaeological survey, Roman pottery manufacture*
Bibliographischer Datensatz/*Bibliographic reference*: https://zenon.dainst.org/Record/003076849